



women & children's
health research institute



2013 Research Day Program & Abstract Book

November 6, 2013 | Westin Hotel

Acknowledgments

The Women & Children's Health Research Institute (WCHRI) is a partnership between the University of Alberta and Alberta Health Services, with the generous support of the Stollery Children's Hospital Foundation and the Royal Alexandra Hospital Foundation. Also, the Faculty of Medicine & Dentistry provides operating and in-kind support.

The University of Alberta and the Faculty of Medicine & Dentistry

The University of Alberta strives to create and support an environment of research excellence across the university to fuel knowledge advancement, discovery and innovation; all of which provide significant contributions to society provincially, nationally and globally. It is through the continued support of the University of Alberta's Faculty of Medicine & Dentistry (FoMD), that WCHRI can house many of its core groups and its entire administrative staff. FoMD also provides partial funding for WCHRI's operating expenses, without which WCHRI would not be able to manage its many grants programs and research support initiatives.



Alberta Health Services

Alberta Health Services is a strong and active supporter of WCHRI and their guidance has been invaluable in ensuring that women's health and Alberta Health Services' standards in the delivery of clinical care, wellness and prevention in Alberta remain a focus of WCHRI's mandate.



The Stollery Children's Hospital Foundation

The Stollery Children's Hospital Foundation is dedicated to raising funds for specialized equipment, sub-specialty medical education to train the best of the best, research to pave the way to the discovery of new treatments or cures for child health issues and specialized programs that improve patient and family outcomes at the Stollery Children's Hospital.



The Royal Alexandra Hospital Foundation

The Royal Alexandra Hospital Foundation inspires community support for their healthcare facilities. The Foundation empowers compassionate, leading-edge patient care through education, research, technology and facility enhancements. They provide support for the Lois Hole Hospital for Women and a growing number of specialized centres of healthcare located at the Royal Alexandra Campus.



Welcome from the Director

Welcome to the 6th Annual Women & Children's Health Research Institute Research Day!

The past year has been an exciting one for WCHRI and I am thrilled to see this excitement continue at our 6th annual Research Day. This year, we will continue to shine the spotlight on our trainees, with increased oral presentations and poster viewing time scheduled. Out of over 300 registrants, 178 abstracts have been submitted. Of the abstracts submitted, most are from trainees: 8 Clinical Fellows, 14 postdoctoral fellows, 20 residents or subspecialty residents, 39 PhD students, 28 Masters and 33 undergraduate students. The quality of abstracts is excellent, making the selection of oral presentations challenging. We have, in fact, increased the number of oral presentations this year to 54 trainees and our poster presentations to 126, allowing our young researchers a greater opportunity to present their results to an audience.

We start the morning with three concurrent workshop sessions. Two of these are professional development seminars. Our Keynote Speaker, Dr. Jon McGavock will present a workshop on preparing your first successful grant proposal and WCHRI staff member, Dr. Anita Kozyrskyj will discuss her experiences in developing an interdisciplinary research team. We encourage you to actively participate by expressing your ideas, questions and comments. The third workshop showcases WCHRI's new "Concept to Completion" delivery model. As part of this new model, WCHRI is re-organizing some of its operational services into programs and developing a new set of initiatives to support researchers. WCHRI Associate Director, Dr. Lawrence Richer will provide details on these exciting changes.

We are very excited this year to have a renowned Keynote Speaker, Dr. Jonathan McGavock. Dr. McGavock is the Robert Wallace Cameron Chair in Evidence-based Child Health in the Department of Pediatrics and Child Health in Faculty of Medicine at the University of Manitoba and a CIHR New Investigator. Dr. McGavock's presentation will focus on his current research in obesity and type 2 diabetes in Northern Manitoba. His talk is entitled "***The Prevention and Treatment of Type 2 Diabetes in Youth: the Role of Exercise and Lipotoxicity.***"

Our day will close with a reception during which we will announce the winners of the poster and oral presentations. We will all have the opportunity to network, socialize and support our trainees. As part of the WCHRI community, we invite you to take the opportunity to meet, mingle and learn more about your colleagues and their research. We hope that you will find the day interesting and informative, as well as an opportunity to have some fun.

Please remember to mark your calendar for next year's WCHRI Research Day, which is scheduled for November 5, 2014.

We would like to thank everyone who helped make this year's Research Day possible! Enjoy the day!



Dr. Sandy Davidge
Director
Women & Children's Health Research Institute

WCHRI Overview

The best hospitals with the best care are the ones who invest in discovery research. These are the innovators and leaders, shaping our health system for the future. WCHRI acts as a research arm for the Stollery Children's Hospital and the Lois Hole Hospital for Women and is the steward of their respective Foundations' investment in health research. The vision of WCHRI is to improve health outcomes for women and children through research; a vision that is shared by the U of A and Alberta Health Services (AHS).

With core funding from the Stollery Children's Hospital Foundation (SCHF) (focused on improving children's health) and the Royal Alexandra Hospital Foundation (RAHF) (focused on improving women's health), the vision of WCHRI can be realized. This unique structure creates a collaborative environment with a shared focus on maternal, fetal and newborn health and the families of these patients. The value of WCHRI is particularly important in Edmonton as the most complicated pregnancies are delivered at the Lois Hole Hospital for Women along with care of the newborns while the Stollery Children's Hospital cares for children from birth through adolescence.

WCHRI catalyzes and facilitates women and children's health research through a variety of grant programs, research infrastructure/support and strategic partnerships within the university and the broader research community.

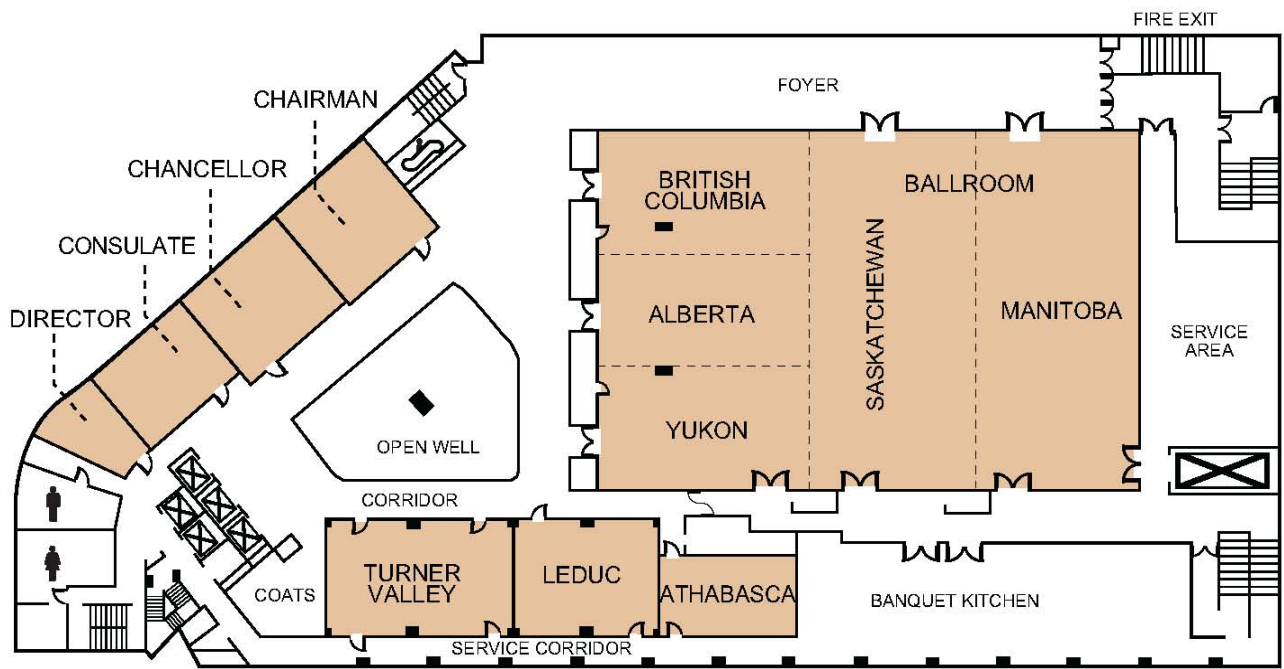
WCHRI goals are:

- To facilitate basic and applied health research activities focused on women and children's health
- To encourage collaborative and translational research within the university and outside (community, industry, national/international institutions)
- To promote training in health research with a focus on women and children
- To ultimately translate this knowledge for the purpose of providing the best clinical health outcomes and clinical practice guidelines
- To impact locally, provincially, nationally as a catalyst for research and an advocate for women and children's health
- To provide a mechanism for performance accountability
- To be a vehicle for communication of research outcomes and to provide a unified team approach for facilitating communication and establishing representation to the public, granting agencies and authorities

To build on our achievements in women and children's research, we continue to develop strategic initiatives dedicated to enhancing the current investment in research and leveraging new provincial and national opportunities.

Agenda at a Glance

Time				
07:00	07:45	Registration / Poster Set-up		
07:45	07:55	Welcome - Dr. Sandy Davidge - Ballroom		
08:00	08:50	Workshop #1 Chairman Room <i>Effective Team-Building for an Interdisciplinary Research Program</i> Dr. Anita Kozyrskyj, U of A	Workshop #2 Turner Valley Room <i>The Keys to Preparing Your First Successful Grant Proposal: a Case Study of a Randomized Controlled Trial</i> Dr. Jon McGavock, University of Manitoba	Workshop #3 Leduc Room <i>Introducing Concept to Completion: Enhancing Innovation and Discovery in the Hospital and Community</i> Dr. Lawrence Richer, U of A
09:00	10:30	Oral Presentations #1 Chairman Room Pediatric Sub-specialty Residents	Oral Presentations #2 Turner Valley Room Child & Youth Health - Cardiovascular Research	Oral Presentations #3 Leduc Room Child Health - Developmental Research
10:30	10:45	Poster Viewing / Coffee Break - Ballroom		
10:45	12:15	Oral Presentations #4 Chairman Room Child & Youth Health - Nutrition & Bone Research	Oral Presentations #5 Turner Valley Room Women's Health	Oral Presentations #6 Leduc Room Child & Youth Health - Health Research in Children & Families
12:15	13:00	Lunch - Ballroom		
13:00	14:30	Poster Viewing & Judging - Ballroom		
14:30	16:00	Oral Presentations #7 Chairman Room Pediatric Residents	Oral Presentations #8 Turner Valley Room Women's Health	Oral Presentations #9 Leduc Room Child Health - Developmental & Newborn Outcomes
16:00	16:30	Reception - Ballroom		
16:30	17:30	Keynote Speaker - Dr. Jonathan McGavock, Manitoba Institute of Child Health - Ballroom <i>The Prevention and Treatment of Type 2 Diabetes in Youth: the Role of Exercise and Lipotoxicity</i>		
17:30	17:45	Awards & Wrap-up - Ballroom		



BANQUET LEVEL

Detailed Agenda of Events

This event has been approved by the Canadian Paediatric Society for a maximum of 6.5 credit hours under the Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada. The specific opinions and content of this event are not necessarily those of the CPS, and are the responsibility of the organizer(s) alone.

Registration, Poster Set-up & Breakfast - Foyer

07:00 – 07:45

Welcome - Ballroom

Dr. Sandy Davidge, Director, WCHRI

07:45 – 07:55

Workshop #1 – Chairman Room

08:00 – 08:50

Effective Team-Building for an Interdisciplinary Research Program

Dr. Anita Kozyrskyj, U of A

Attendees will be able to:

- Explain how to establish collaborative relationships
- Plan how to build the team for a study
- Demonstrate how to prepare a budget for a team grant
- Assess the required steps when they receive grant money
- Identify possible pitfalls

Anita Kozyrskyj is Associate Professor, Department of Pediatrics, Faculty of Medicine & Dentistry, University of Alberta, Canada. Trained as an epidemiologist following a 10-year career in neonatology and high risk pregnancy, she designed the novel SAGE (Study of Asthma Genes and the Environment) health database linkage birth cohort study of 14,000 mother-child dyads in Manitoba. SAGE has since become an international platform for interdisciplinary research on the genetics and environmental determinants of asthma. Dr. Kozyrskyj's research focus is on perinatal risk factors for child asthma which can be modified, such as maternal stress and infant antibiotic use. She leads the SyMBIOTA (Synergy in Microbiota) project on environmental shaping of the infant intestinal microbiome and subsequent development of childhood asthma and other diseases, one of the seven \$2.5 million dollar CIHR Microbiome team grants in Canada. The SyMBIOTA program derives its data from the 4-site CHILD (Canadian Healthy Infant Longitudinal Development) pregnancy cohort study. Anita was a CIHR New Investigator Award during 2003-2008 and WCHRI Research Chair during 2008-2013. She has over 100 peer-reviewed publications, including 44 manuscripts from the SAGE study. She is a member of the International Society of DOHaD and on the editorial board for the Journal of DOHaD.

Workshop #2 – Turner Valley Room

08:00 – 08:50

The Keys to Preparing Your First Successful Grant Proposal: a Case Study of a Randomized Controlled Trial

Dr. Jon McGavock, University of Manitoba

Dr. McGavock will present a brief overview of the lessons he's learned over the past six years as an independent investigator at the Manitoba Institute of Child Health. This workshop will focus on several themes related to preparing your first grant and will address the following questions: Why should I consider designing and executing a clinical epidemiological study? Who should I talk to first before preparing my grant? What key pillars are needed to create a solid foundation for my first clinical epidemiological grant application? How should I prepare my grant? When am I ready to submit a grant?

At this session day, attendees will be able to:

- Identify the steps required in designing and executing a clinical epidemiological study
- Identify who they should talk to before preparing a grant
- Explain the key pillars needed to create a solid foundation for the first clinical epidemiological grant application
- Outline the key steps in preparing a grant
- Assess when to submit a grant

Workshop #3 – Leduc Room

08:00 – 08:50

Introducing Concept to Completion: Enhancing Innovation and Discovery in the Hospital and Community

Dr. Lawrence Richer, U of A

Innovation and discovery are integral to advances in the health of women and children. Yet clinical research is hindered by a myriad of challenges ranging from access to clinical data, recruiting patients or controls, research coordination, regulatory requirements, biostatistical support, knowledge synthesis and translation. While WCHRI has developed excellent skills and expertise to facilitate research, 'Concept to Completion' is conceived as a strategic principle to enhance access to these resources while addressing areas of need through a flexible project-based workflow. Moreover, a number of strategic opportunities are or will be available including Strategy for Patient Oriented Research (SPOR) and Strategic Clinical Networks (SCNs) that can be leveraged in the support of high quality, impactful research and evidence-informed care. The presentation will review WCHRI's strategic initiatives under the umbrella of 'Concept to Completion' and update the status of relevant provincial and national opportunities.

Attendees will be able to:

- Identify core infrastructure available to researchers through the Women and Children's Health Research Institute (WCHRI) for clinical research
- Establish a project-based workflow for clinical research projects
- Explain how to utilize resources strategically

Dr. Lawrence Richer, WCHRI Associate Director, is an Associate Professor and Pediatric Neurologist, who has an active clinical practice and on-going research related to pediatric migraine therapy. He also has a strong interest in clinical and research informatics and has a leadership role in the Faculty of Medicine and Dentistry as Associate Dean, Health Informatics.

Oral Presentations #1

Pediatric Sub-specialty Residents

Chairman Room | 09:00 - 10:30

No.	Name	Position	Preceptor	Abstract Title
162	Sibasis Daspal	Subspecialty Resident	Sandra Escoredo	Current practice of car seat safety assessment prior to discharge-a survey in Canadian neonatal units
163	Bree Erickson	Resident	Hamdy El-Hakim	Does the morphological type of laryngomalacia have any diagnostic value?
153	Elsa Fiedrich	Subspecialty Resident	Chloe Joynt	Self-evaluation of procedural skill competencies by Neonatal Perinatal Medicine trainees in Canada
161	Long Guo	Clinical Fellow	Ian Adatia	Oxygen consumption measurement in children after cardiac surgery: a comparison of breath by breath method and mass spectrometry
158	Praveen Kumar	Subspecialty Resident	Lisa Hornberger	Impact of intrauterine exposure to chronic hypoxia on myocardial and arterial function from early postnatal developmental stages in the rat
157	Gaurav Nagar	Clinical Fellow	Manoj Kumar	Reliability of transcutaneous bilirubin devices in preterm infants: a systematic review
160	Deliwe Ngwezi	Clinical Fellow	Lisa Hornberger	Congenital heart disease and the emission of developmental toxicants in Alberta, Canada

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #2

Child & Youth Health - Cardiovascular Research

Turner Valley Room | 09:00 - 10:30

No.	Name	Position	Supervisor	Abstract Title
71	Ross Ballantyne	Undergraduate Student	Andrew Mackie	Examining the relationship between quality of life and illness perception in adults with congenital heart disease to inform the care of children and adolescents with congenital heart disease
12	Gina Catena	Undergraduate Student	Andrew Mackie	"Not such a kid thing anymore": a qualitative analysis of the experiences of young adults with congenital heart disease as they transition from pediatric to adult cardiac care
50	Heather Edgell	Postdoctoral Fellow	Joanna MacLean	Cardiovascular responses to hypoxia or hypercapnia are attenuated in children with bronchopulmonary dysplasia
116	Mohamed Elgendi	Postdoctoral Fellow	Ian Adatia	Time-domain analysis of heart sounds in children with and without pulmonary artery hypertension
102	Taylor Rocque	Undergraduate Student	Lori West	A mouse model for ABO-incompatible transplantation (ABOi tx): study of hyperacute rejection following ABOi heart tx
20	Keren Tang	MSc Student	Cindy Jardine	Participatory video: exploring physical activity in northern First Nation communities

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #3

Child Health - Developmental Research

Leduc Room | 09:00 - 10:30

No.	Name	Position	Supervisor	Abstract Title
1	Kirsten Arnold	Undergraduate Student	Sarah C. Hughes	Merlin control of proliferation via post-transcriptional regulation
137	Joshua Kim	Undergraduate Student	Toshifumi Yokota	Converting human skin cells to muscle cells for drug testing using a retroviral vector system
88	Joshua Lee	MSc Student	Toshifumi Yokota	Dystrophin exons 45-55 skipping with antisense oligonucleotide cocktail
98	Todd Radostits	Undergraduate Student	Lesley Mitchell	ABO blood group genotype and factor VIII plasma levels are risk factors for thrombosis in pediatric cancer patients
63	Joel Strautman	MSc Student	Francois Bolduc	The Drosophila gene spastin is necessary for unimpaired locomotor behaviour
114	Jamie Zagozewski	PhD Student	David Eisenstat	Dlx homeobox genes and epigenetic regulation of retinal cell fate

Poster Viewing / Coffee Break - Ballroom
10:30 – 10:45

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #4

Child & Youth Health - Nutrition & Bone Research

Chairman Room | 10:45 - 12:15

No.	Name	Position	Supervisor	Abstract Title
43	Stuart Astbury	PhD Student	Rhonda Bell	A high fructose diet during pregnancy significantly affects intestinal development in the offspring
133	Muhammad Zafar Hydrie	Postdoctoral Fellow	Sunita Vohra	Systematic review of pediatric Type 1 diabetes RCTs
99	Seema Rajani	MSc Student	Justine Turner	Exploring Ethnic Differences in Children Diagnosed with Celiac Disease at a Canadian Pediatric Celiac Clinic
14	Allison Rasquinha	Other	Geoff Ball	Parents' recommendations to improve pediatric weight management programs: a preliminary analysis
9	Deenaz Zaidi	PhD Student	Eytan Wine	Alterations in intestinal epithelial cell extrusion and microbial virulence in pediatric inflammatory bowel diseases
115	Rui Zheng	Postdoctoral Fellow	Edmond Lou	In-vivo validation of ultrasound and radiograph measurements: A pilot study

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #5

Women's Health

Turner Valley Room | 10:45 - 12:15

No.	Name	Position	Supervisor	Abstract Title
118	Schammim Ray Amith	Postdoctoral Fellow	Larry Fliegel	Inhibition of the Na ⁺ /H ⁺ exchanger (NHE1) increases susceptibility to paclitaxel in invasive breast cancer cells
119	Matthew Benesch	PhD Student	David Brindley	Inhibition of autotaxin delays the initial phase of breast tumor progression in an orthotopic mouse model
39	Jasdeep Mann	MSc Student	Dr. Ing Swie Goping	Proliferative function of Bad in breast cancer
5	Alicia Pawlowski	MSc Student	Anita Kozyrskyj	Maternal early life trauma and wheeze and allergy in young children: could there be an association?
126	Xiaoyun Tang	Postdoctoral Fellow	David Brindley	Lipid phosphate phosphatase-1 inhibits breast cancer progression
41	Jodi Wilkie	Medical Professional	Tammy Bungard	A case series of LMWH use in pregnancy: should trough anti-Xa levels guide dosing?

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #6

Child & Youth Health - Health Research in Children & Families

Leduc Room | 10:45 - 12:15

No.	Name	Position	Supervisor	Abstract Title
82	Janine Halayko	MSc Student	Joyce Magill-Evans	"Use your brakes and slow down": Teaching two-wheeled cycling to children with a cognitive delay
53	Sandra Hodgetts	Assistant Professor		Profile and predictors of service needs in Autism Spectrum Disorders
85	Katrina Kully-Martens	PhD Student	Carmen Rasmussen	Mathematics intervention for children with prenatal alcohol exposure and fetal alcohol spectrum disorder
134	Tristan Robinson	MSc Student	Rebecca Gokiert	Developing a knowledge translation strategy for sharing results with First Nation communities
104	Lori-Ann Sacrey	Postdoctoral Fellow	Lonnie Zwaigenbaum	Visual attention in infants at high-risk for autism: A longitudinal study from 6-to-36-months-old
105	Amber Savage	PhD Student	David McConnell	The subjective well-being of Canadian youth with parent report disability: a structural equation modeling analysis

Lunch – Ballroom

12:15 – 13:00

Poster Viewing & Judging - Ballroom

13:00 – 14:30

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #7

Pediatric Residents

Chairman Room | 14:30 – 16:00

No.	Name	Position	Preceptor	Abstract Title
155	Andrea L. Chambers	Resident	Samina Ali	Pediatric pain management practice and policies across Alberta emergency departments
146	George Michael	Resident	Justine Turner	Knowledge, beliefs, and attitudes regarding the use of donor human milk in neonatal intensive care units in Edmonton
164	Daniela Migliarese	Resident	Justine M. Turner	How we feel the day of endoscopy: a quantitative comparison of survey responses from parents and pediatric patients undergoing open access versus traditional clinic referral for upper endoscopy.
152	Fareeha Nasir	Resident	Joan Robinson	Awareness of and adherence to clinical practice guidelines among pediatric physicians in Canada
151	Jessica Nicoll	Resident	Georg Schmölder	Exhaled carbon dioxide and its relationship to neonatal breathing patterns in preterm infants immediately after birth.
159	Sneha Suresh	Resident	Joan Robinson	CMV prevention in pediatric solid organ transplant recipients

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #8

Women's Health

Turner Valley Room | 14:30 – 16:00

No.	Name	Position	Supervisor	Abstract Title
48	Alison Care	Postdoctoral Fellow	Sandra Davidge	Effect of advanced maternal age on pregnancy outcomes in the rat
56	Daniel Kerage	PhD Student	Denise Hemmings	S1P-mediated regulation of vascular tone involves the balance between increased endothelial permeability and activation of NO pathway
38	Megan Lefebvre	PhD Student	Maria Mayan	Adherence amongst chaos: a qualitative study to explore adherence to antiretroviral therapy
62	Sarah Post	Undergraduate Student	Denise Hemmings	A novel pathway through which 17 β -estradiol effects dilation in uterine vasculature
11	Sue Ross	Professor		Seven years of TVT Secur: using McKinlay's "seven stages in the career of a medical innovation" to explore the short career of a surgical device used to treat stress urinary incontinence in women
125	Jane Schulz	Associate Professor		TVT Secur versus TVT vaginal tape devices for stress urinary incontinence: a randomized trial

Full abstracts are located by number in the pages at the end of this program.

Oral Presentations #9

Child Health - Developmental & Newborn Outcomes

Leduc Room | 14:30 – 16:00

No.	Name	Position	Supervisor	Abstract Title
46	Stephane Bourque	Postdoctoral Fellow	Sandra Davidge	Prenatal hypoxia programs long-term endothelin-1 signaling and hypertension in aged offspring
87	Rotem Lavy	PhD Student	Fred Berry	FOXC1 regulation of MESP2 expression during somitogenesis
101	Laura Reyes	PhD Student	Sandra Davidge	Vascular effects of aerobic exercise training in an animal model of hypoxia-induced intrauterine growth restriction
8	Georg Schmölder	Postdoctoral Fellow	Po-Yin Cheung	Chest compressions (CC) during sustained inflations (SI): a novel technique of neonatal resuscitation that improves recovery and survival in a neonatal porcine model
111	Megan Ure	Undergraduate Student	Todd Alexander	Hypercalciuria is caused by a mutation in a 5' URE of Claudin-14 that introduces a novel INSM1 transcription factor binding site
37	Liyan Zhang	Other	Gary Lopaschuk	Activating PPAR α prevents post-ischemic contractile dysfunction in hypertrophied neonatal hearts

Full abstracts are located by number in the pages at the end of this program.

Wine & Cheese - Ballroom

16:00 – 16:30

Welcome to Dr. Jon McGavock, Keynote Speaker - Ballroom

Dr. Sandy Davidge

16:20-16:30

16:30 - 17:30

The Prevention and Treatment of Type 2 Diabetes in Youth: the Role of Exercise and Lipotoxicity

Dr. Jonathan McGavock – University of Manitoba



Dr. Jonathan McGavock is the Robert Wallace Cameron Chair in Evidence-based Child Health in the Department of Pediatrics and Child Health in Faculty of Medicine at the University of Manitoba and a CIHR New Investigator. At the Manitoba Institute of Child Health, he established the Centre for Physical Activity and Cardiometabolic Health in Youth in 2006 focused on studying the role of physical activity in prevention and management of Type 2 diabetes in children. His work spans the continuum of patient-oriented research from sophisticated physiological studies to community-based participatory action research in First Nation communities. Dr. McGavock's laboratory is funded by the Heart and Stroke Foundation of Canada, the Canadian Diabetes Association, the Manitoba Health Research Council and the Canadian Institutes of Child Health.

Dr. McGavock's presentation will focus on his current research in obesity and Type 2 diabetes in Northern Manitoba.

Attendees will be able to:

- Explain the role of physical activity in prevention and management of type 2 diabetes in children
- Identify the continuum of patient-oriented research from sophisticated physiological studies to community-based participatory action research in First Nation communities

Awards & Wrap-up - Ballroom

17:30 – 17:45

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Poster Presentations

Ballroom | 13:00 - 14:30

No.	Name	Supervisor	Abstract Title
6	Halima AL-Hashemi	Lisa Hornberger	Exploring the relationship between increased arterial stiffness and myocardial hypertrophy in infants of diabetic mothers
65	Mona ALAsmi	Hien Q. Huynh	Incidence of eosinophilic esophagitis in pediatric in northern Alberta
154	Hanaa Abdellateef	Juzer Tyebkhan	Impact of Birth Kangaroo Care (BKC) on admission to NICU for late preterm infants
66	Lauren Albrecht		Information needs and preferences of healthcare providers and healthcare consumers in general emergency departments in Canada: data from the Translating Emergency Knowledge for Kids (TREKK) needs assessment
67	Misagh Alipour	Eytan Wine	A balanced IL-1 β activity is required for host response to citrobacter rodentium infection
68	Liliana Alvarez	Albert Cook	The neurophysiology of augmentative manipulation: a method for technical implementation
69	Abeer Alzaben	Diana Mager	Interrelationships between high fructose corn syrup intake (HFCS) and markers of liver dysfunction, insulin resistance and inflammation in children and adolescents with non-alcoholic fatty liver disease (NAFLD)
85	Jawad Alzamil	Todd Alexander	Identification of Claudin-14 promoter and calcium sensing receptor (CaSR) signaling sensitive elements
23	Mandy Archibald	Shannon Scott	Exploring the information needs of parents of a child with asthma: an interpretive description
70	Jillian Avis	Geoff Ball	Developing the readiness and motivation interview for families (RMI-Family) in managing pediatric obesity: a pilot study
2	Abul Kalam Azad	YangXin Fu	CCDC3 attenuates TNF- α induced endothelial inflammation via inhibition of NF- κ B signaling
130	Katherine Bannar-Martin	Lisa Hartling	A systematic review of the use of narrative storytelling and visual arts-based approaches as knowledge translation tools in healthcare
24	Kareema Batal	Raine Kim	Protecting children from the harmful effects of unhealthy food and beverage marketing: engaging parents in change
25	Lavanya Bathini	Hamdy El-Hakim	Adductor paralysis in children
135	Lola Baydala		Substance abuse prevention in the Maskwacis Four Nations: a community-based participatory research partnership
72	Deryk Beal		A strategic plan for gene discovery in childhood stuttering
44	Raie Bekele	David Brindley	Tamoxifen induces tumor regression independent of the estrogen receptor through oxidative stress induced ceramide synthesis
167	Vivian Biancardi	Gregory Funk	Respiratory pattern of newborn male rats (P6) exposed to fluoxetine during prenatal period

Poster Presentations - Continued

Ballroom | 13:00 - 14:30

No.	Name	Supervisor	Abstract Title
175	Prashant Bobhate	Ian Adata	Cardiac Catheterization in Children with Pulmonary Hypertension
73	Prashant Bobhate	Ian Adata	QRS duration reflects abnormal right ventricle to pulmonary artery coupling in children with pulmonary hypertension
45	Michael Bording-Jorgensen	Eytan Wine	Characterizing the role of IL-1 β in macrophage handling of citrobacter rodentium infection
4	Meagan Brown	Hemmings Denise	A novel mechanism for human cytomegalovirus to increase endothelial permeability mediated through the sphingosine 1-phosphate pathway
49	Eric Chalmers	Edmond Lou	Predicting the outcome of brace treatment for Scoliosis: a machine learning approach
172	Andrea L. Chambers	Troy W.S. Turner	Pre-hospital and emergency room management of pediatric anaphylaxis
74	Daniel Chambers	Francois Bolduc	De-regulation of AKT pathway proteins in a drosophila melanogaster model of fragile x syndrome
169	Amanda Chan	Edmond Lou	A reliability study of a computer-assisted method to measure the Cobb angle, vertebral rotation and spinous process angle for AIS
75	Amanda Chan	Edmond Lou	Can ultrasound determine the optimum pad pressure during brace casting for scoliosis?
131	Emily Chan	Alvaro Osornio-Vargas	An environmental injustice analysis of carcinogenic emissions in Windsor ON
76	Tamya Chowdhry	Joanna MacLean	Obesity, breathing and sleep in children and adolescents: defining the spectrum of sleep disordered breathing
77	Nathan Chu	Gregory D. Funk	The role of adenosine in the hypoxic ventilatory response
168	Alex Cojocar	Thomas Churchill	Luminal flushing of intestinal specimens with an amino acid solution during cold storage to minimize mucosal injury and improve transplant outcomes
174	Sibasis Daspal	George Schmölzer	Endotracheal tube suctioning and lung recruitment practice-an observation in NICU
78	Kristie DeHaan	Joanna MacLean	Cardio respiratory function in pre-adolescent children born extremely preterm
120	Dev Dutta	Catherine Field	Docosahexaenoic acid (DHA) supplementation reduces human breast cancer tumour growth in Nu/Nu Mice
173	Frank Fan	Richard Schulz	Oncostatin-M induced cardiomyocyte dedifferentiation involves proteolytic actions of Matrix metalloproteinase-2
15	Frank Fan	Richard Schulz	Mechanism of cardiac sarcomere disassembly during myocyte division: key to heart regeneration
121	Hilary Fast	Sue Ross	Study of menopause symptoms, health complications, and treatment progressions in women cared for at a specialized menopause clinic: Preliminary chart review

No.	Name	Supervisor	Abstract Title
132	Faiqa Fayyaz	Catherine Field	Estimation of dietary and supplemental intake of folate, vitamin B12 and B6 in women in Alberta during pregnancy and postpartum
26	Rachel Flynn	Shannon Scott	Understanding the factors that shape the implementation process of a clinical practice change
16	Rebecca Georgis	Rebecca J. Gokiart	Adapting to life in Canada: the resettlement stressors of recently arrived parent and adolescent refugees
79	Tamara Germani	Lonnie Zwaigenbaum	A scoping review of participation-based assessments for children with autism spectrum disorder
42	Satvinder Ghotra	Jerome Yager	Age at stroke onset influences the long term clinical outcome and health related quality of life after pediatric stroke
17	Aimee Gonzalez de Armas	Shannon Scott	Developing an inventory of ongoing/unpublished arts and narrative-based knowledge translation strategies in healthcare
80	Marilyn Gordon	Shairaz Baksh	The tumor suppressor RASSF1A links inflammation and cancer via a novel regulation of tyrosine phosphorylation of YAP
170	Chelsey Grimbly	Mary Jetha	A case report of congenital hyperinsulinism where genetic testing was incongruent with imaging
81	Lyndsey Hahn	David McConnell	Wellbeing outcomes of children being raised by a parent with a disability
83	Lisa Hartling		Scoping reviews: A valuable first step in knowledge synthesis
52	Emma Hjartarson	Sandra Davidge	Mechanisms for impaired cardiovascular adaptations to pregnancy at an advanced maternal age
84	Priya Jaggi	Alvaro Osornio-Vargas	Content validation of a questionnaire specifically designed to identify pediatric environmental risk factors
145	Venu Jain	Venu Jain	Outcomes of pregnancies complicated by red blood cell antibodies
144	Rahim Janmohamed	Winnie Sia	Postpartum vascular risk and weight management at the post-partum preeclampsia clinic (PPPEC)
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122	Katie Kinaschuk	Denise Hemmings	High fructose levels increase uric acid production and ICAM-1 expression in trophoblasts
179	Rachel King	Denise Larsen	Exploring hope in early adolescent girls through photos and conversations
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18	Stephanie Kowal	Cindy Jardine	"If They Tell Me to Get It, I'll Get It. If They Don't...": immunization information delivery for new immigrant women in Edmonton

Poster Presentations - Continued

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123	Erin Lewis	Catherine Field	Pregnant and lactating women in Alberta are not meeting daily dietary recommendations for choline
90	Chloe Luck	Rachel Wevrick	Feeding pathways in a mouse model of Prader-Willi Syndrome
27	Megan Lukasewich	Cindy Jardine	Engaging Aboriginal youth in participatory video production to prevent tobacco use
58	Christina MacKay	Margie Davenport	Exercise and brain blood flow during pregnancy
91	Joanna MacLean		Ventilatory response in pre-adolescents born extremely preterm
55	Maysoon A. Mahmoud	Monika M. Keelan	Antisense DNA: A novel approach to treat Helicobacter pylori infection
59	Hunter McColl	David Eisenstat	Developmental regulation of the intestinal stem cell marker Bmi1 by the DLX2 homeobox transcription factor
19	Andrew McCutcheon	Gina Higginbottom	From many voices, shared experiences: a narrative synthesis of the experiences of newcomer women in Canada in relation to maternity care
92	Qaasim Mian	Po-Yin Cheung	Excessive tidal volumes administered through positive pressure ventilation in preterm infants may cause brain damage
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28	Kacey C Neely	Nicholas L Holt	Families' perceptions of and experiences in a pediatric weight management intervention
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40	Kim-Cuong T. Nguyen	Lawrence H. Le	Preferential excitation of ultrasonic guided waves in long bones: in-vitro and in-vivo studies
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94	Dana Olstad	Linda and Kim McCargar and Raine	Nudging healthy eating in recreational sports settings
139	Joe Ou	Shairaz Baksh	Inhibition of triple negative breast cancer proliferation with resveratrol and its derivatives
96	Joseph Pagano	Richard Thompson	Cardiac magnetic resonance imaging based fat-water myocardial T1 mapping using IDEAL-T1
47	Silvia Pagliardini	Silvia Pagliardini	Cholinergic modulation of paraFacial respiratory group neurons
97	Annie Pentney	Shannon Scott	Data presentation for national prioritization in a pan-Canadian study
13	Arnaldo Perez	Geoff Ball	Pediatric weight management care: what is involved in not getting involved
31	Shanon Phelan		Inclusion, participation, and disability: opportunities for engagement in childhood activities
176	Shanon Phelan		Re-framing school-based practice: A case example
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100	Ann Revill	Gregory Funk	Towards a greater understanding of airway control: do Dbx1-derived neurons give rise to XII inspiratory premotoneurons?
32	Florencia Ricci	Cara Dosman	Getting physicians to screen child development: applying knowledge of a developmental screening tool throughout pediatric residency
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33	Erica Roberts	Kate Storey	Exploring the role of the APPLE School administrator in affecting change in school culture
103	Ian Rodger	Eytan Wine	Secretory immunoglobulin-A/G and the intestinal microbial composition of pediatric Inflammatory Bowel Disease
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34	Urooj Siddiqui	Hamdy El-Hakim	Arytenoid dislocation in CHARGE Infants
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Poster Presentations - Continued

Ballroom | 13:00 - 14:30

No.	Name	Supervisor	Abstract Title
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21	Tho Tran	Lawrence Le	Extracting the low-order ultrasonic guided waves propagating in a human tibia using high-resolution Radon transform
109	Sarah Treit	Christian Beaulieu	White matter correlates of behavioural inhibition in healthy childhood development
110	Conrad Tsang	Amanda Newton	First Nations children demonstrate higher rates of emergency department visits for suicide-related behaviours and longer times to mental health care follow-up in Alberta
127	Ganesh Venkatraman	David Brindley	Lysophosphatidate induces multi-drug resistance transporter expression and chemoresistance in breast cancer cells
22	Quang Vo	Edmond Lou	Three-dimensional reconstruction of scoliotic spine using 3D medical ultrasound: a pilot study
112	Sunita Vohra		Systematic review of the safety of mind-body interventions in children
35	Osnat Wine	Alvaro Osornio-Vargas	Building a multi-stakeholder children's environmental health research agenda in Alberta
178	Chengsheng Wu	Raymond Lai	The biological function of Stat1 in ALK positive anaplastic large cell lymphoma
113	Jenny Yoon	Sujata Persad	Neuroprotective effects of sulforaphane on hypoxic-ischemic neurons
171	Nese Yuksel		Knowledge, attitudes and beliefs regarding calcium and vitamin d in a sample of middle-aged women
129	Nese Yuksel		A content analysis of blogs on bioidentical hormone therapy
36	Norazah Zahari	Nee Scze Khoo	Three-dimensional echocardiography identify mechanisms of early post operative valve failure in pediatric and congenital heart disease
128	Nubia Zepeda	YangXin Fu	Examining the effect of RUNX3 in ovarian cancer chemoresistance
136	Yong Zhang	Gregory Funk	The secondary anoxic depression of inspiratory activity in the rhythmic medullary slice is attenuated by endogenous ATP, possibly via astrocyte-mediated, glutamatergic excitation of inspiratory neurons

Full abstracts are located by number in the pages at the end of this program.

Full Abstracts





Abstract #: 1
 Presenter: Kirsten Arnold
 Supervisor: Sarah C. Hughes
 Title: Merlin control of proliferation via post-transcriptional regulation
 Authors: Kirsten Arnold, Sarah C. Hughes
 Affiliations: U of A

Introduction

Neurofibromatosis Type 2 (NF2) is a hereditary syndrome caused by mutation of the gene NF2, which leads to tumours of the eighth cranial nerve and other tumours of the central nervous system. The NF2 gene product Merlin is known to be involved in cellular proliferation, polarity, and adhesion, but the mechanism of its activity is not characterized, and although Merlin is expressed in most cell types, its loss causes tissue-specific tumours. *Drosophila* is a useful model for NF2 because *Drosophila* Merlin is 55% identical to and is functionally homologous to human Merlin. In *Drosophila*, the non-canonical translation initiation factor eIF4E-3 has been identified as a Merlin interacting protein which complexes with both Merlin and specific mRNAs at multiple stages of *Drosophila* development. eIF4E-3 also appears to be expressed in a tissue-specific pattern, thereby potentially linking Merlin activity to specific cell types. We hypothesize that a complex with Merlin including eIF4E-3 and other proteins effects Merlin activity through post-transcriptional regulation, in a cell-type specific manner.

Methods

To determine where eIF4E-3 is expressed in *Drosophila*, multiple tissues were dissected from different stages in *Drosophila* development, and eIF4E-3 protein was visualized by immunofluorescence.

Results

eIF4E-3 was found to be specifically expressed in cells of the embryonic ventral nerve cord, and in a subset of neurons in the brain and ventral nerve cord of both third instar larval and adult wild-type *Drosophila*. eIF4E-3 expression was also seen outside the central nervous system, including in the veins of pupal wings and on the membranes and axons of differentiated photoreceptor cells in third instar larval eye discs.

Conclusions

These expression patterns make eIF4E-3 a particularly interesting Merlin interacting partner, as its expression appears to be specific to the nervous system, which is the tissue type that NF2 tumours are associated with.

Funded by: WCHRI Summer Studentship

Abstract #: 2
 Presenter: Abul Kalam Azad
 Supervisor: YangXin Fu
 Title: CCDC3 attenuates TNF- α induced endothelial inflammation via inhibition of NF- κ B signaling
 Authors: Abul Kalam Azad, Subhadeep Chakrabarti, Zhihua Xu, Sandra T. Davidge, YangXin Fu
 Affiliations: U of A

Introduction

Endothelial cells (ECs) form the inner lining of blood vessels and regulate vascular integrity, homeostasis, leukocyte adhesion, angiogenesis and vasculogenesis upon interaction with different physical and chemical stimuli within the circulation. CCDC3 is a newly identified secretory protein mainly expressed in adipocytes and ECs. However, the biological function of CCDC3 is unknown. A recent study reported that CCDC3 mRNA expression is down-regulated by tumor necrosis factor- α (TNF- α) in ECs. Therefore, our objective is to investigate the role of CCDC3 in TNF- α -induced inflammatory responses in ECs.

Methods

Human microvascular endothelial cells (HMECs) were stably transduced with CCDC3-FLAG. Overexpression was confirmed by Western blotting. HMECs stably transduced with an empty vector (HMECs/vector) were used as a control. We also stably knocked down the expression of CCDC3 in HMECs and human umbilical vein endothelial cells (HUVECs) using a lentivirus-delivered shRNA approach. Knockdown was confirmed by real-time PCR. A shRNA construct expressing a scrambled sequence (shRandom), which does not target any known genes, was used as a control. Cells were left untreated or treated with 10 ng/ml TNF- α for 4h or 24h. Protein levels of leucocyte adhesion molecules (VCAM-1 and ICAM-1) were determined by Western blotting and real-time PCR.

Results

We found that CCDC3 overexpression in HMECs attenuated the TNF- α induced expression of VCAM-1. Knockdown studies showed that reduced expression of CCDC3 enhanced TNF- α -induced expression of VCAM-1 and ICAM-1 in both HMECs and HUVECs. We also observed that CCDC3 overexpression decreased TNF- α -induced translocation of p50 and p65 in HMECs.

Conclusions

We demonstrated that CCDC3 negatively regulates TNF- α -induced expression of leukocyte adhesion molecules in ECs, likely by inhibiting the activation of NF- κ B pathway.

Abstract #: 3
 Presenter: Sara Japoni
 Supervisor: David D. Eisenstat
 Title: DLX transcriptional regulation of neural progenitor cell fate in the developing forebrain
 Authors: Sara Japoni, Michelle Casey, Jamie Zagosewski, David D. Eisenstat
 Affiliations: U of A

Introduction

Dlx homeobox genes are required for central nervous system development. Of the six Dlx genes in mice, Dlx1, Dlx2, Dlx5 and Dlx6 are expressed in the developing forebrain. Dlx genes encode transcription factors that bind to TAAT/ATTA motifs of regulatory regions and activate or repress target gene expression. The ventral forebrain gives rise to both glial and neuronal progenitors, the latter of which express Dlx. In the Dlx1/Dlx2 double knockout (DKO) mouse, tangential migration of inhibitory interneurons to the neocortex from the ganglionic eminences is disrupted. Additionally, Dlx1/Dlx2 DKO progenitors differentiate into oligodendrocytes when transplanted into a wild-type background. We hypothesize that Dlx1/Dlx2 actively repress oligodendrocyte differentiation while promoting interneuron differentiation and migration. Our goal is to identify DLX2 transcriptional targets required for interneuron migration and/or differentiation. Candidate homeodomain binding sites in several gene promoters required for oligodendrocyte and interneuron differentiation and migration have been identified. Nkx2.2 is required for proper oligodendrocyte differentiation. Disruption of signaling by the CXCR4 chemokine receptor and/or its ligand CXCL12 results in improper migration of interneurons in the forebrain.

Methods

We have used chromatin immunoprecipitation (ChIP) of embryonic mouse forebrain (E13.5) using a specific polyclonal antibody to DLX2 followed by PCR using oligonucleotide primers flanking candidate homeodomain binding motifs. Targets are characterized using gel shift and reporter gene assays in vitro and validated by gene expression studies in vivo comparing wild-type and DKO forebrain tissues.

Results

ChIP-based PCR of embryonic mouse forebrain demonstrated that DLX2 binds to regions containing putative DLX2 binding sites upstream of the transcriptional start sites of Nkx2.2 and Cxcr4. Dlx2 significantly affected luciferase reporter gene expression in vitro when co-expressed with the regulatory regions of Cxcr4 (activation) and Nkx2.2 (repression) occupied by DLX2 in vivo.

Conclusions

Our results support the hypothesis that DLX2 directly regulates expression of Cxcr4 and Nkx2.2 in order to maintain proper differentiation and migration of interneurons and concurrently repress oligodendrocyte cell fate in the developing forebrain. Experiments are ongoing to assess specificity of DLX2 binding to these regulatory regions and to assess the expression of these genes in the Dlx1/Dlx2 DKO mouse forebrain. Deciphering the molecular genetic basis of forebrain development is relevant to our understanding of neuronal migration disorders, congenital epilepsy and of autism.

Funded by: WCHRI Start-up or Retention Funding

Abstract #: 4
 Presenter: Meagan Brown
 Supervisor: Denise Hemmings
 Title: A novel mechanism for human cytomegalovirus to increase endothelial permeability mediated through the sphingosine 1-phosphate pathway
 Authors: Meagan Brown, Martina Mackova, Daniel Kerage, Denise Hemmings
 Affiliations: U of A

Introduction

Human cytomegalovirus (HCMV) is highly prevalent in the developed world and is the leading cause of congenital infection. Women infected with HCMV are also at a higher risk for preeclampsia, which can lead to intrauterine growth restriction (IUGR). HCMV increases vascular permeability and we have previously shown that it also impacts vascular function. Both of these effects during infection could occur through a bioactive lipid called sphingosine 1-phosphate (S1P) since HCMV upregulates sphingosine kinase (SK), the enzyme that produces S1P. S1P regulates both endothelial permeability and vascular tone; however, the relationship between these vascular effects is not understood. In endothelial cell (EC) culture, S1P enhances barrier function at physiological concentrations (0.1-1 μ M) by binding the S1P1 receptor. Alternatively, S1P decreases barrier function at high concentrations (>5 μ M) by binding the S1P3 receptor. We previously showed that inhibiting SK in cultured ECs during HCMV infection increased barrier function, indicating that HCMV exerts its barrier disruptive effects through the S1P pathway. In this study, we hypothesized that HCMV infection disrupts junctional proteins between ECs by activation of S1P receptors and also alters S1P receptor levels.

Methods

Human Umbilical Vein Endothelial Cells (HUVECs) were grown to confluence on coverslips and treated with 1 μ M or 10 μ M S1P with or without VPC23019, a S1P1/S1P3 receptor antagonist. Cells were stained with phalloidin-488 to visualize actin and anti-VE-cadherin before examination with confocal microscopy. Additionally, HUVECs were infected with HCMV for 6, 24 and 48 hours, collected, and western blotted with anti-S1P1, anti-S1P3 and anti-VE-cadherin antibodies.

Results

We found that S1P (10 μ M) effectively disrupted vascular endothelial cadherin (VE-cad) and actin filaments in ECs while S1P (1 μ M) showed little disruption. Notably, co-treatment of ECs with S1P (10 μ M) and VPC23019 reversed the disruption. Infection of ECs with HCMV did not alter S1P1 or S1P3 receptor levels at 6, 24 or 48 hours post-infection. However, total VE-cad increased over time, demonstrating the effect of HCMV on junctional protein levels.

Conclusions

Better understanding of HCMV-mediated endothelial barrier disruption, particularly the role of S1P, will be important in evaluating the role of infection in preeclampsia and IUGR.

Funded by: WCHRI Bridge Funding





Abstract #: 5
 Presenter: Alicia Pawlowski
 Supervisor: Anita Kozyrskyj
 Title: Maternal early life trauma and wheeze and allergy in young children: could there be an association?
 Authors: Suzanne Tough, Sandra Wiebe, Lionel Dibden, Anita Kozyrskyj
 Affiliations: U of A

Introduction

Chronic trauma in childhood can program an abnormal stress reaction in affected children, resulting in lifelong difficulties with stress management and poor health outcomes linked to changes in the immune system. At the same time, maternal stress during pregnancy and the postpartum period has been linked to a number of diseases in childhood, including wheeze and asthma. Given the potential for her own maltreatment in childhood to shape a mother's later response to stress during pregnancy, it seems plausible that children may demonstrate inheritance of their mother's childhood trauma through their own health issues. We hypothesize that preschool children are more likely to have a wheeze or allergic disorder if their mother has a history of childhood abuse, independent of her distress during pregnancy and postnatally.

Methods

The Community Perinatal Care (CPC) Study of Calgary provides extensive data on 791 medically low risk mothers, of whom 61 (7.7%) and 77 (9.7%) had children with a wheezing disorder and allergies, respectively, at age 3. In order to investigate how past maternal maltreatment might be associated with wheeze and asthma in young children, a number of validated questionnaires within the CPC study were used to measure and categorize past maternal trauma. The abuse variables produced were used in logistic regression models, adjusted for relevant confounding factors, to determine their association with the development of wheeze or allergies in preschool children.

Results

Calgary women fell within reported Canadian norms in their experience of childhood maltreatment, as did their children in their reports of wheeze and allergy. After adjustment, multiple logistic regression revealed a significant association between a mother's experience of household dysfunction before age 5 (defined as having parents who fought violently, and at least one parent who had a substance abuse problem) with childhood wheeze (adjusted OR: 4.01, 95%CI: 1.36-11.81). The experience of severe psychological abuse, including both emotional neglect and abuse, was associated with an increase in childhood allergies (adjusted OR 3.36, 95%CI: 1.12-10.10). Given sex interactions of a moderate strength, we decided to also perform an analysis centered on gender. In women who were sexually abused before age 8, their sons were more likely to have allergies (adjusted OR: 2.83, 95%CI: 1.03-7.72). Experiencing more than 2 types of maternal childhood abuse before age 8 increased the likelihood of daughters having a wheeze disorder (OR: 8.96, 95% CI: 2.15-37.35).

Conclusions

Stressful maternal childhood experiences are associated with the development of wheeze and allergy in children.

Funded by: WCHRI Graduate Studentship

Abstract #: 6
 Presenter: Halima AL-Hashemi
 Preceptor: Lisa Hornberger
 Title: Exploring the relationship between increased arterial stiffness and myocardial hypertrophy in infants of diabetic mothers
 Authors: Halima AL-Hashemi, Timothy Colen, Akiko Hirose, Najlaa Alrajaa, Venu Jain, Winnie Savard, Michael Stickland, Sandra Davidge, Lisa Hornberger
 Affiliations: U of A

Introduction

We have previously shown that infants of diabetic mothers (IDM) have increased aortic stiffness in the first 6 months of life, and aortic stiffness is related to poor maternal glycemic control in pregnancy. Increased left ventricular (LV) posterior (LVPW) and interventricular septal (IVS) wall thickness is observed in IDM in late gestation and early infancy, predominantly in mothers with worse glycemic control. Although it is generally believed that the LV hypertrophy in IDM regresses after the first 3 months, we have recently shown that hypertrophy persists even in late infancy. In this study we sought to explore the relationship between aortic stiffness and LV hypertrophy in IDM. We hypothesized that LVPW and IVS wall thickness would be greater in infants with greater aortic stiffness.

Methods

Diabetic pregnancies were prospectively recruited in the mid trimester. Their infants were evaluated in infancy by echocardiography. LVPW and IVS wall thickness was measured by m mode and measurements were compared to normative data for the calculation of z scores based on body surface area. Aortic wall stiffness was assessed with echocardiography, using 2D and pulsed Doppler interrogation of the ascending aorta and distal arch. Aortic pulse wave velocity (PWV) was calculated as the distance from the ascending aorta to distal arch, divided by the time interval from the QRS to the onset of flow for the two interrogated sites (m/s).

Results

Twenty-one IDM were investigated at a median age of 7 weeks (range 2-48 weeks). Mean aortic PWV was 4.7 ± 1.7 m/s, and the mean IVS and LVPW z scores were 1.3 ± 1.2 and 1.4 ± 1.1 , respectively. Although no relationship was observed between PWV and IVS, there was a weak but positive correlation between aortic PWV and LVPW z score ($r=0.50$, $p=0.027$).

Conclusions

Our study suggests that a potential relationship exists between the degree of stiffness of the aorta and LV wall thickness. This could be due to a common prenatal exposure (hyperglycemia) or to a causal relationship (greater aortic stiffness leading to evolution or persistence of LV hypertrophy). Further studies are underway to determine the etiology of increased aortic stiffness and LV hypertrophy and the natural course of these changes.

Abstract #: 7
 Presenter: Fahim Rahman
 Supervisor: Lori West
 Title: Blood group A transgenic mice as a model for abo-incompatible transplantation (ABOI TX): study of antibody-mediated rejection (AMR)
 Authors: Fahim H. Rahman, Annetta Kratochvil, Taylor Rocque, KeSheng Tao, Thuraya Marshall, Banu Sis, Michael Mengel, Anthony J.F. d'Apice, Peter Cowan, Bruce Motyka, Lori J. West
 Affiliations: U of A

Introduction

The ABO blood group system can act as a barrier to safe organ Tx between incompatible donors and recipients. However, in infants ABOi heart Tx (HTx) can be performed safely as anti-blood group antibody levels are low or absent. Following ABOi HTx, immune tolerance develops to the donor A/B antigen(s), but tolerance mechanisms are not well understood. Mice do not normally express ABO antigens, therefore we developed transgenic mice (A-Tg, C57BL/6 [B6] background) expressing human A-antigen on vascular endothelium. 'A into O' ABOi HTx can be approximated using A-Tg mice as donors and wild-type (WT) B6 mice as recipients. Herein, we investigated AMR following Tx of A-Tg hearts into WT mice. We hypothesize that A-Tg grafts will undergo AMR in WT recipients with anti-A antibodies.

Methods

Juvenile WT mice were induced (sensitized) to produce anti-A antibodies by subcutaneous injection of human A red blood cells. Serum anti-A antibody titres were assessed by hemagglutination assays. Sensitized WT recipients received a heart transplant from an A-Tg (n=4) or WT (n=2) donor, and graft function (beating) was monitored by palpation. Grafts were harvested following cessation of beating or at 14 days post-transplant; AMR was assessed by histology.

Results

There was histological evidence of AMR in A-Tg hearts transplanted into WT recipients with high anti-A antibody titres; WT heart grafts showed no evidence of AMR. Grafts are currently being examined for immunopathologic characteristics of AMR, including deposition of complement C4d and the presence of intravascular macrophages.

Conclusions

These findings show that incompatible A-Tg heart grafts undergo AMR following Tx into WT mice with high anti-A antibody titres. Studies using this model are ongoing to determine whether tolerance to donor A-antigen develops in WT mice transplanted with A-hearts at a young age with no detectable anti-A antibody.

Funded by: WCHRI Summer Studentship, AIHS Summer Studentship, Heart and Stroke Foundation of Canada

Abstract #: 8
 Presenter: Georg Schmölder
 Supervisor: Po-Yin Cheung
 Title: Chest compressions (CC) during sustained inflations (SI): a novel technique of neonatal resuscitation that improves recovery and survival in a neonatal porcine model
 Authors: Georg Schmölder, Megan O'Reilly, Joseph LaBossiere, Tze-Fun Lee, Shaun Cowan, David Bigam, Po-Yin Cheung
 Affiliations: AHS, U of A

Introduction

Guidelines on neonatal resuscitation recommend 90 CC and 30 manual inflations (3:1) per minute in newborn infants. However, the optimal compressions to inflations ratio remains unknown. The study aimed to determine if CCs during SI improves return of spontaneous circulation (ROSC) of asphyxiated newborn piglets compared to coordinated 3:1 resuscitation.

Methods

Term newborn piglets (n=8/group) were anesthetized, intubated, instrumented and exposed to 45-minute normocapnic hypoxia followed by asphyxia. Protocolized resuscitation was initiated when heart rate decreased to 25% of baseline. Piglets were randomized to receive either 3:1 resuscitation (3:1 group) or CCs during SIs (SI group). Piglets randomized to the SI group received a SI with a peak inflating pressure of 30 cm H₂O for 30 sec. During the SI, CCs were provided at a rate of 120 per minute. SI was interrupted after 30 sec for one second before a further 30 sec SI was provided. During the whole time CCs were continued. CC and SIs were continued until ROSC. Continuous respiratory parameters, cardiac output, mean systemic and pulmonary artery pressures, and regional blood flows were measured.

Results

Median (IQR) time for ROSC was significantly reduced in the SI group vs. 3:1 group [38 (23-44) sec vs. 143 (84-303) sec, p=0.0008]. In the SI group, administration of oxygen and epinephrine was significantly lower, whilst minute ventilation and exhaled CO₂ were significantly increased, compared to the 3:1 group. The SI group had significantly higher mean systemic and pulmonary arterial pressures during resuscitation compared to the 3:1 group [51(10) vs. 31(5) mmHg; 41(7) vs. 31(7) mmHg, respectively; all p<0.05], with improved cardiac output and common carotid blood flow. Both SI and 3:1 groups had similar mesenteric and renal blood flows during recovery.

Conclusions

Combining CCs and SI significantly improved ROSC with better hemodynamic recovery in asphyxiated newborn piglets when compared to the standard coordinated 3:1 resuscitation.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 9
 Presenter: Deenaz Zaidi
 Supervisor: Eytan Wine
 Title: Alterations in intestinal epithelial cell extrusion and microbial virulence in pediatric inflammatory bowel diseases
 Authors: Deenaz Zaidi, Michael Bording-Jorgensen, Julia Liu, Eytan Wine
 Affiliations: U of A

Introduction

Inflammatory Bowel Diseases (IBD), encompassing Crohn Disease and Ulcerative Colitis are highly prevalent in children in Canada with unknown etiology. Multiple factors including alterations in microbial composition, increased intestinal permeability and immune dysregulation contribute to IBD pathogenesis. Increased epithelial cell extrusion, as measured by counting gaps between epithelial cells, has not been assessed in children. Our hypothesis is that epithelial gap density is elevated in pediatric IBD patients and correlates with microbial virulence, barrier disruption and inflammation. Our objective was to study the correlation between epithelial gaps, microbial virulence and gut inflammation.

Methods

In a prospective, blinded, cohort study, epithelial gap density of the duodenum in pediatric IBD patients and non-IBD controls was evaluated using probe-based confocal laser endomicroscopy (pCLE) after injecting fluorescein. Epithelial gap density was defined as the number of gaps normalized to epithelial cells counted. Intestinal aspirates were analyzed for cytokine levels, immunoglobulin detection via western blots, microbial quantification via qPCR, and bacterial culture. Effect of luminal factors on microbial invasion potential was assessed by Gentamicin protection assays on T84 cells. Florescein levels were quantified to assess permeability.

Results

51 participants have been recruited. Initial analysis revealed differences between IBD and non-IBD patients. Epithelial gaps, anaerobic bacteria and fluorescein levels were marginally higher in IBD patients than in non-IBD controls. Aspirates from patients altered invasion of bacteria in vitro. PCR of bacterial isolates showed prevalence of *E. coli* from various phylotypes and different virulence factors.

Conclusions

Results indicate that epithelial gaps, pathogens, and host factors likely play integrated roles in IBD pathogenesis. Altered microbial invasion potential suggests involvement of host and microbial factors. Analysis of bacterial virulence and association with barrier disruption will provide further insight about pathogenesis.

Abstract #: 10
 Presenter: Beate Sydora
 Supervisor: Sue Ross
 Title: Research and clinical application of the menopause-specific quality of life (MENQOL) questionnaire: a comprehensive systematic review
 Authors: Hilary Fast, Sandy Campbell, Nese Yuksel, Kathleen Hegadoren, Tami Shandro, Nan Schuurmans, Jacqueline Lewis
 Affiliations: U of A, AHS

Introduction

The menopause-specific quality of life (MENQOL) questionnaire was developed as a validated research tool to measure condition-specific QOL in early postmenopausal women. The exact extent and relevance of MENQOL usage in medical research is not known. Our goal is to examine the use of MENQOL since its 1996 publication in order to assess its value in providing patient assessment information to clinicians, patients, and healthcare workers.

Methods

We conducted a systematic review of English and non-English articles from 1996 to 2012 using Google Scholar and 10 biomedical and clinical data bases with "menqol" as the search term. Additional manuscripts were collected from key article references. All studies using MENQOL as an investigative tool were included. Review articles, meeting abstracts and proceedings, dissertations, and incomplete trials were excluded. Data extracted contained study design, intervention, MENQOL version, modification of usage assessment, sample age and menopause status. Data analysis included quantitative and qualitative assessment of the studies that used MENQOL.

Results

Out of 1251 items retrieved, 166 manuscripts were identified that fit our inclusion criteria. The studies included surveys (63), RCTs (56), experimental studies (28), pilot studies (14), psychometric evaluations (3), and case reports (2). Half of the studies recruited only postmenopausal women, the menopause status for which MENQOL is validated; the other half included women in pre- and peri-menopause. While the majority of articles (127) mentioned using either MENQOL or MENQOL-Intervention, only 18 articles reported on the proper use with regard to menopause status, recall period, and questionnaire item number. Twelve manuscripts reported using a modified form of MENQOL with reduced or added questionnaire items.

Conclusions

Our data indicate that the MENQOL questionnaire has found extensive use over the past 16 years in research and clinical studies of various designs. Used in the appropriate and validated form MENQOL appears to be a valuable tool for the assessment of menopausal women.

Funded by: WCHRI Cavarzan Chair endowment, RAH Foundation, Lois Hole Hospital for Women

Abstract #: 11
 Presenter: Sue Ross
 Supervisor:
 Title: Seven years of TVT Secur: using McKinlay's "seven stages in the career of a medical innovation" to explore the short career of a surgical device used to treat stress urinary incontinence in women
 Authors: Sue Ross, Magali Robert, Ariel Ducey
 Affiliations: U of A

Introduction

In 1981 McKinlay described "Seven Stages in the Career of a Medical Innovation". We wished to examine whether the model fits a modern device life cycle, and to comment on device manufacturers' influence. We chose to examine the complete life cycle of TVT Secur, a surgical mesh kit used for the treatment of stress urinary incontinence in women, from marketing in 2006 to withdrawal for commercial reasons in March 2013.

Methods

We reviewed PubMed to identify all types of publication that mentioned TVT Secur from 2006 to September 2013. Each publication was classified according to McKinlay stages. Analysis explored stage and year of publication.

Results

68 relevant publications from 22 countries were published over 7 years. McKinlay 7 stages were: 4 promising reports, 1 professional adoption, 0 third-party endorsement, 30 standard procedure, 15 randomised controlled trials (RCTs) first appeared in 2010 and mainly compared outcome with other TVT family members, 0 professional denunciation of RCT findings, 0 erosion and discreditation. Other publications included anatomical studies, technical reports and reviews.

Conclusions

McKinlay's 7 stages, originally used to describe the life cycle of medical innovations, were useful to describe TVT Secur's truncated life cycle. TVT Secur, fully approved and licensed according to all jurisdictional requirements, generated few early promising reports, but many descriptive cohort studies. As predicted by McKinlay's model, more rigorous RCT evidence appeared half way through its life cycle, but was mainly limited to comparisons with other TVT family members. Device withdrawal resulted in lack of erosion and discreditation to date. Applying McKinlay's 7 stages to this case highlighted the role of the device manufacturer in driving the device cycle. Our study also identified the importance of careful premarket evaluation of safety and effectiveness to reduce the need for commercial discontinuation of devices. In the absence of such evaluations and long-term follow-up, physicians must carefully explain to patients the lack of evidence to support the Clinical use of the device.

Funded by: the Cavarzan Chair is funded by WCHRI

Abstract #: 12
 Presenter: Gina Catena
 Supervisor: Andrew Mackie
 Title: "Not such a kid thing anymore": a qualitative analysis of the experiences of young adults with congenital heart disease as they transition from pediatric to adult cardiac care
 Authors: Gina Catena, Andrew Mackie, Gwen Rempel
 Affiliations: U of A

Introduction

For many adolescents growing up with congenital heart disease (CHD) or heart transplantation, psychosocial challenges become magnified when transitioning from pediatric to adult health services. The relationships that young adults have with their cardiologists and parents influence these experiences. The aim of this study was to examine the experiences of adults transitioning from pediatric to adult cardiac care in the context of their transition to adulthood.

Methods

Telephone interviews with 21 adults aged 18-25 and diagnosed with moderate to severe CHD or heart transplantation were digitally recorded and transcribed. Thematic and direct content analysis was used to examine the transition to adult cardiac care.

Results

Participants were at different stages of transition from pediatric to adult care. Four participants reported receiving care in pediatric cardiology programs, fourteen reported receiving care through adult programs, and three were unsure. Five themes were identified. The themes "A Little Home" and "A Personal Connection, A Comfort Thing" characterized the participants' fondness for their pediatric cardiology setting and care providers. "Letting Go" characterized the participants' perspectives on the challenges faced by parents in fostering the independence and autonomy expected in adult programs. Negative and positive experiences of the transition process were accounted for in "No Kicking, Pushing or Shoving" and "Not Such a Kid Thing Anymore."

Conclusions

Leaving a health care environment that one has known for the majority of their childhood is a significant change for young adults with CHD. Cardiologists and care providers have the opportunity to tailor their approach to this reality, just as young adults need to allow time for new relationships to form. Furthermore, parents may benefit from assistance during transition, so that they can help foster independence and autonomy in their child. Lastly, the transition to adult cardiac care does not start and end with the transfer. It is a process that begins before the transfer, and continues afterwards.

Funded by: WCHRI Start-up, Innovation, Summer Studentship





Abstract #: 13
 Presenter: Arnaldo Perez
 Supervisor: Geoff Ball
 Title: Pediatric weight management care: what is involved in not getting involved
 Authors: Arnaldo Perez, Nicholas L Holt, Katherine M Morrison, Laurent Legault, Arya M Sharma, Rebecca Gokiert, Jean-Pierre Chanoine, Geoff DC Ball
 Affiliations: U of A

Introduction

Background: Despite the physical, mental, social, and economic consequences of childhood obesity, a large number of families referred for pediatric weight management care do not initiate treatment. Reasons for non-initiation among these families are poorly understood. Objective: To characterize parents' reasons for not initiating pediatric weight management care.

Methods

Semi-structured interviews were conducted with parents (n=18) of overweight or obese children who declined to participate in pediatric weight management programs in Edmonton, Hamilton, Montreal, and Vancouver. Parents were asked about the referral process, their perceptions of the suggested program, and the reasons for declining care. Interviews were digitally recorded, verbatim transcribed, and entered into N-VIVO 10. Collected data were thematically analyzed.

Results

Sixteen reasons for not initiating care were identified, which were grouped into three categories: i) perceived need-related reasons: perceiving that the child did not have a weight problem and already had a healthy lifestyle; ii) intention-related reasons: having an alternative source of weight management including self-management, associating undesirable costs with initiation, attributing low efficacy to the program, perceiving little control over obesity leading factors, prioritizing other issues, possessing personality traits interfering program initiation, and lacking information about the suggested program; and iii) barrier-related reasons: child's lack of motivation, financial constraints, lack of time, weather, distance, personal illnesses, and program misperceptions. A unique configuration of reasons of one or more categories ultimately led families to decline care.

Conclusions

Referral providers and facilitators of orientation sessions have an important role to play in enhancing treatment initiation among referred families to pediatric weight management care. Attempts to enhance treatment initiation must be tailored to the nature of the reasons leading families to decline care.

Funded by: WCHRI Trainee Research Grant

Abstract #: 14
 Presenter: Allison Rasquinha
 Supervisor: Geoff Ball
 Title: Parents' recommendations to improve pediatric weight management programs: a preliminary analysis
 Authors: Allison Rasquinha, Arnaldo Perez, Nicholas L. Holt, Katherine M. Morrison, Laurent Legault, Arya M. Sharma, Rebecca Gokiert, Jean-Pierre Chanoine, Geoff Ball
 Affiliations: U of A

Introduction

Background: Obesity can have a negative impact on the health and well-being of children. In response, tertiary-level weight management programs offer services designed to improve lifestyle and behavioural habits among children and families. However, many families enrolled in clinical programs discontinue their care prematurely, which can reduce their potential to make and maintain healthy changes. In order to optimize family engagement in care and minimize the risk of attrition, the objective of this research was to characterize parents' recommendations for improving pediatric weight management programs,

Methods

As part of a four-site, CIHR-funded, qualitative study, semi-structured interviews were held with the parents (n=24) of children with obesity who recently enrolled in one of four multidisciplinary pediatric weight management clinics in Vancouver, Edmonton, Hamilton, and Montreal. Parents were asked specifically for their recommendations to improve the program in which their child attended. Interviews were audio-recorded and transcribed verbatim before being entered into N-VIVO 10 for data analysis. Qualitative constant comparison was used to identify commonalities among recommendations.

Results

In total, seven program-level categories emerged from our parent interviews. Overall, specific recommendations were made by parents to improve elements including: (i) program quality, (ii) appointment duration, (iii) accessibility and flexibility, (iv) clinician practices, (v) educational content, (vi) health services delivery, and (vii) partnerships with external professionals and agencies.

Conclusions

The most frequent parent recommendations emphasized a desire for programs to be located in more convenient/accessible locations, offer more convenient appointment times, and provide health services that were more inclusive of family members. Contingent upon more in-depth analyses, experimental studies will be needed to determine whether implementing any of these recommendations improves family engagement, reduces program attrition, and enhances pediatric obesity management.

Abstract #: 15
 Presenter: Frank Fan
 Supervisor: Richard Schulz
 Title: Mechanism of cardiac sarcomere disassembly during myocyte division: key to heart regeneration
 Authors: Frank Fan, Mohammad Ali, Bryan Hughes, Woo-Jung Cho, Waleska Lopez, Richard Schulz
 Affiliations: U of A

Introduction

Unlike lower vertebrates, mammals are thought to lose their capacity to regenerate heart muscle shortly after birth. In contrast, embryonic and neonatal cardiac myocytes in higher vertebrates are hyperplastic yet need to selectively disassemble their myofibrils in order for successful cytokinesis to occur. It is speculated that altered regulation of sarcomere disassembly may partially account for the cessation of proliferation/regeneration of cardiac myocytes in adult mammals. However, the mechanism of sarcomere disassembly is still poorly understood.

Methods

We performed a series of immunofluorescence studies of multiple sarcomeric proteins in proliferating neonatal rat ventricular myocytes (NRVM) and correlated these observations with biochemical changes at different cell cycle stages.

Results

During NRVM mitosis, α -actinin, troponin I and titin were completely disassembled as early as pro-metaphase. We found that α -actinin disassembly preceded that of titin suggesting that titin may disassemble secondary to the collapse of the Z-band. Surprisingly, inhibitors of several key intracellular proteases could not effectively block the disassembly of α -actinin, troponin I or titin. It is also noteworthy that sarcomere disassembly begins promptly at late prophase concurrent with dissolution of the nuclear envelope. Also the disassembly of both α -actinin and titin is initiated spacially from the perinuclear region and then spreads quickly towards the cell margin. Early signs of reassembly start in late telophase when the nuclear envelope reforms. There was a dramatic increase in cytosolic (soluble) α -actinin during disassembly and its phosphorylation status was altered in mitosis. Inhibition of cyclin-dependent kinase 1 (cdk1) quickly induced reassembly of the sarcomere and an exit from mitosis which suggests a role of cdk1 in governing sarcomere integrity.

Conclusions

Sarcomere disassembly may be initialized by the release from the nucleus of a phosphatase that is activated indirectly by cdk1 and followed by the rapid dephosphorylation of α -actinin into sarcomere incompatible isoforms which mediate this process.

Abstract #: 16
 Presenter: Rebecca Georgis
 Supervisor: Rebecca J. Gokiert
 Title: Adapting to life in Canada: the resettlement stressors of recently arrived parent and adolescent refugees
 Authors: Rebecca Georgis, Rebecca J. Gokiert
 Affiliations: U of A

Introduction

Canada, a signatory to the United Nations Convention Related to the Status of Refugees, accepts 20,000-30,000 refugees each year (CIC, 2012). As a result of pre- and trans-migration stressors such as war trauma and displacement, refugees have increased mental health and other needs during resettlement (Fazel, et al., 2012). While the needs of earlier refugees, from primarily European and Asian regions have been well studied, little is known about the experiences of more recent refugees who come from African and Middle Eastern regions. The purpose of this study was to examine the resettlement stressors of newcomer Somali adolescents and their parents. At the time of the study, the adolescents and parents were attending a Transitions Support Program.

Methods

Ethnography was the method used for this qualitative study. Four types of data were collected: 36 interviews with Somali adolescents and program stakeholders, one focus group with 12 parents, 39 field notes, and 24 meeting notes. Latent content analysis was used to code patterns in the data and group them into thematic categories.

Results

Two categories of stressors were identified: socio-emotional (SE) and acculturation-related (AR). SE stressors were similar for parents and adolescents and included social isolation, discrimination, and grief for family members and friends left behind. Parent AR stressors included learning English, navigating new and unfamiliar health and education systems, and having culturally different parenting practices. Adolescent AR stressors also included learning English. In addition, adolescents struggled with new roles and responsibilities within the family and with developing a bicultural identity.

Conclusions

This poster presentation highlights the challenges newcomer Somali adolescents and parents face when resettling in Canada. Identification of challenges is a critical first step in enhancing supports and resources for newcomer families who have escaped war and conflict. Recommendations for policy and practice will be provided.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 17
 Presenter: Aimee Gonzalez de Armas
 Supervisor: Shannon Scott
 Title: Developing an inventory of ongoing/unpublished arts and narrative-based knowledge translation strategies in healthcare
 Authors: Aimee Gonzalez de Armas, Lauren Albecht, Shannon Scott
 Affiliations: U of A

Introduction

Storytelling and art are powerful, ancient forms that can overcome barriers to impart knowledge. This project emerged from a CIHR funded knowledge synthesis on the use of narrative and arts-based approaches as methods of knowledge translation (KT) in healthcare. It was determined that a complimentary inventory of unpublished/ongoing arts and narrative-based KT projects, which, alongside the knowledge synthesis would capture the full scope of the use of narrative and arts-based approaches as methods of KT in healthcare. This inventory seeks to identify Canadian organizations engaged in ongoing/unpublished projects using art and/or narrative-based KT strategies, and the features of these initiatives.

Methods

The first phase involved meeting with the Advisory Panel to identify these key Canadian organizations. Then, we approached KT Canada members, the primary authors in Arts in Health reviews: Boydell et al. (2012), Fraser et al. (2011), Scott et al. (2013), as well as the Canadian organizations suggested by the Panel, via personal conversations, online research, and social media interfaces. We inquire about their engagement in ongoing/unpublished projects that use arts and/or narrative as KT approaches, as well as their features: project title, focus, narrative and arts-based approaches used, anticipated completion date, and project webpage. To expand the project database, we requested contact information of organizations/individuals in the investigators' professional networks who are currently engaged in this type of work. We will continue to use this approach until we experience data saturation.

Results

We are currently in the data collection and analysis phase of this project.

Conclusions

An inventory and a 'network map' of the included organizations will be posted on Dr. Scott's research program webpage (www.echo.ualberta.ca), which will be useful for multiple audiences and inform the development of future strategies and collaborations to put research into practice, as well as updating the systematic review.

Abstract #: 18
 Presenter: Stephanie Kowal
 Supervisor: Cindy Jardine
 Title: "If They Tell Me to Get It, I'll Get It. If They Don't...": immunization information delivery for new immigrant women in Edmonton
 Authors: Stephanie Kowal, Dr. Cindy Jardine, Dr. Tania Bubela
 Affiliations: U of A

Introduction

Effective vaccine communication strategies by health agencies increase compliance with immunization programs. Unfortunately, current strategies do not address the needs of recent immigrants in Canada, who have lower vaccination rates than non-immigrants. Using community-based research, the School of Public Health collaborated with the Multicultural Health Brokers to examine how foreign-born mothers access and use current vaccination information to make personal and childhood immunization decisions.

Methods

This qualitative study used 25 semi-structured interviews with new immigrant mothers from Bhutanese refugee, South Asian, and Chinese communities who were living in Edmonton. We generated data using the convergent interview method and analyzed interview transcripts using content analysis. To ensure that the project was relevant and culturally appropriate for immigrant communities in Edmonton, we engaged the Brokers during research question development, data collection (which required translation), data analysis, and knowledge translation planning.

Results

Three main findings around vaccination information were: 1) participants in each community passively received immunization information. Most communication took place at doctors' visits and resulted in decisions to follow doctors' recommendations. Very few women discussed denying vaccines after a doctor's recommendation. Women stated trusting physician expertise and vaccine safety regardless of past adverse reactions. 2) Accordingly, this study's participants universally trusted vaccines (i.e. there was no anti-vaccination sentiment). 3) Recollection of the H1N1 vaccination campaign, where both pregnant women and children were priority groups, was almost nil. This demonstrates a lack of reach of our public health vaccination campaigns.

Conclusions

Communicators must respond to the passive information gathering practices of these individuals to reach more new immigrant families. Our study shows that current communication strategies are neither culturally relevant nor accessible to immigrant women, limiting their ability to make informed vaccination decisions. Resulting recommendations will improve communication strategies for service providers such as our partner, the Multicultural Health Brokers. However, current information delivery failures potentially limit the abilities of new immigrant women to protect themselves and their children from communicable diseases.

Funded by: WCHRI Graduate Studentship|Summer Studentship|Trainee Travel Grant|Qualitative Core Resource, CHIR, HQCA, AWA, FGSR, Alberta Government

Abstract #: 19
 Presenter: Andrew McCutcheon
 Supervisor: Gina Higginbottom
 Title: From many voices, shared experiences: a narrative synthesis of the experiences of newcomer women in Canada in relation to maternity care
 Authors: Andrew McCutcheon, Gina Higginbottom, Myfanwy Morgan, Joyce O'Mahoney
 Affiliations: U of A

Introduction

The barriers to care faced by newcomers to urban Canada have been well documented; institutional bias, cultural difference, language issues, and difficulty navigating Canadian health systems have conspired to exacerbate the inequities in the social determinants of health that these individuals face. What has been less well researched are the experiences of newcomers to Canada in relation to maternity care received in Canada. As a population of particular interest in terms of promoting long term health of new comer Canadians, Women experiencing maternity and childbirth in Canada are the subject of the work that is the basis for this presentation. The ethnoculturally diverse nature of Canadian society and Canada's statutory commitment to multiculturalism means that a synthesis of knowledge related to immigrant experiences of maternity care is an urgent imperative to realize health potential for many future Canadians. Synthesized evidence will enable knowledge users to appropriately configure maternity services and programs, and to develop professional development initiatives to ensure culturally congruent care. The research question for this study is "What are the experiences of newcomer women in Canada in accessing maternity care services?" Particular focus is being placed on: a) accessibility to and acceptability of maternity care as perceived and experienced by immigrant women, and b) birth and postnatal outcomes.

Methods

We employed a Narrative Synthesis Approach, which relies on the use of text to summarize and explain the findings of multiple studies. This approach was chosen as it is equally suitable for both quantitative and qualitative empirical studies. The four "elements" of a narrative synthesis are i) developing a theory of why and for whom, ii) developing a preliminary synthesis of findings of included studies, iii) exploring relationships in the data, and iv) assessing the robustness of the synthesis. An experienced research librarian was involved in the initial literature search strategy to ensure the comprehensiveness of the review. Qualitative data analysis software (Atlas.ti) was employed for data management and analysis.

Results

Preliminary findings from this review will be reported on in this presentation, with a secondary focus on future directions and implications of the information that was retrieved and synthesised.

Conclusions

Preliminary findings currently in synthesis.

Funded by: WCHRI Summer Studentship

Abstract #: 20
 Presenter: Keren Tang
 Supervisor: Cindy Jardine
 Title: Participatory video: exploring physical activity in northern First Nation communities
 Authors: Keren Tang, Yellowknives First Nation Community Wellness Program, Cindy Jardine
 Affiliations: U of A

Introduction

Despite limited understanding, research exploring Aboriginal communities' perception of physical activity can have significant impact on developing culturally relevant health promotion strategies. Working with youth, this research offers a participatory approach to investigate physical activity in a northern Indigenous context as a collective responsibility that confers benefits beyond illness prevention.

Methods

A participatory action research framework guided this project in two phases. Phase 1 applied the method of participatory video. First Nation youths documented their communities' experience with and perspective of physical activity in a northern setting using video cameras. Focus group with community members and leaders in phase 2 assessed the videos, facilitating critical reflection about active living and the implementation of culturally and geographically appropriate physical activity solutions. Content from the two phases were analyzed using a constant comparison approach that abstracted themes and sub-themes.

Results

Through the video project, we generated various meanings of physical activity. Youths identified physical activity as more than soccer and running, but also traditional games and household chores. They also identified various traditional physical activities practiced on the land. Focus group participants further commented on the role of technology, adult and family influence, as well as resource availability in affecting youth's physical activity level. Research outcomes and findings were disseminated during community suppers, where concrete next steps were developed to improve youth and community engagement with physical activity.

Conclusions

This research demonstrated various ways one First Nation community stays active. Traditional physical activity and life on the land are critical aspects for the Dene people in terms of health and wellbeing. Knowledge generated here will contribute to the current understanding of how physical activity is perceived by Indigenous peoples and also help to elucidate the role of health promotion in these communities, to one that reconciles different ways of life.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 21
 Presenter: Tho Tran
 Supervisor: Lawrence Le
 Title: Extracting the low-order ultrasonic guided waves propagating in a human tibia using high-resolution Radon transform
 Authors: Tho N.H.T. Tran, Lawrence H. Le, Mauricio D. Sacchi, Edmond Lou
 Affiliations: U of A

Introduction

Osteoporosis is caused by the loss of bone mass, deterioration of microstructures, and cortical thinning. One out of four women in Canada has osteoporosis. This subject group has also been deprived of their quality of life due to subsequent osteoporosis-related fractures. Evaluation of cortical thinning has become an important topic for osteoporosis assessment. Quantitative guided-wave ultrasonography (QGWU) is promising to evaluate skeletal quality because guided-wave generation and propagation are sensitive to the cortical thickness and bone elastic properties. This study aims to analyze an in-vivo dataset of a human tibia using high-resolution Radon transform.

Methods

The in-vivo experiment was performed on the right tibia of a male volunteer using axial transmission technique with two 1-MHz-30° transducer-wedge systems. A set of 40 ultrasound records was measured with 2-mm spacing in-terval and 46-mm closest offset. The acquired dataset was transformed from time-distance space to frequency-phase velocity domain to extract dispersion information by means of high-resolution Radon transform. Theoretical dispersion curves were simulated using a tri-layer model with the mean thicknesses of the overlying soft-tissue, cortex and marrow layers being 3 mm, 8.7 mm, and 18.3 mm respectively.

Results

The experimental dispersion curves correlate strongly with the simulation results for seven guided modes. The flexural low-speed mode, which is consistently found in many previous in-vitro and in-vivo studies, has been successfully isolated from the acquired data.

Conclusions

The results have demonstrated that the guided modes travelling in human tibia can be identified and extracted for further analysis. These modes are sensitive to cortical thickness and might provide another alternative to assess cortical thinning. QGWU has a great potential to characterize long bones in vivo.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 22
 Presenter: Quang Vo
 Supervisor: Edmond Lou
 Title: Three-dimensional reconstruction of scoliotic spine using 3D medical ultrasound: a pilot study
 Authors: Quang Vo, Edmond Lou, Lawrence Le
 Affiliations: U of A

Introduction

Adolescent Idiopathic Scoliosis (AIS) is a complicated spinal deformity associated with vertebral rotation and lateral deviation and its cause is unknown. Currently, the Cobb method is the gold standard to assess the severity of scoliosis on a posteroanterior radiograph. Sagittal profiles of AIS patients can also be obtained from lateral radiographs. However, information retrieved from these 2 planes may underestimate the actual severity of the curve. Many researchers have attempted to image and display three-dimensional (3D) structure of the spine for better visualization and diagnosis. Unfortunately, most of these approaches are X-ray based, thus exposing patients to radiation. Recently, ultrasound has been proposed to study scoliosis because of its non-ionizing radiation.

The goal of this study is to investigate if 3D ultrasound imaging can be used to reconstruct a spine three-dimensionally.

Methods

A medical ultrasound system with a 2.5 MHz convex probe and a built-in positioning system was used in this study. The local ethics approval was received. Three different types of spine were scanned: a straight spine Sawbones phantom in a body-simulated setting (immersed inside a water tank), 5 non-scoliotic spines from healthy volunteers and 5 scoliotic spines from AIS patients with curves under 40 degrees in a standing position. The phantom spine was scanned from T6 to L5 and the others were from C7 to L5. After the 3D ultrasound data was acquired, an in-house developed program was used to process, reconstruct and display the images.

Results

All of the spines were reconstructed successfully. The phantom spine provided the best image quality because water, used as soft-tissue mimic, has little effect on attenuation and reflection of ultrasound. The spines from the in-vivo environment showed lower image quality and blurs occurred at the lumbar region. The thickness of the soft tissue also affected the quality of the images. The laminae, transverse processes or spinous processes were easier to be identified in healthy subjects than AIS patients. Any axial rotation of the vertebra might result in missing data in certain regions because only small amount of ultrasound energy penetrated through bone. The vertebral bodies could not be imaged because of the poor penetration.

Conclusions

The results demonstrated that it was feasible to use ultrasound to reconstruct the posterior section of the spine three-dimensionally. More research work is needed to further improve the image quality and the processing speed.

Abstract #: 23
 Presenter: Mandy Archibald
 Supervisor: Shannon Scott
 Title: Exploring the information needs of parents of a child with asthma: an interpretive description
 Authors: Mandy Archibald, Shannon Scott, Vera Caine, Samina Ali, Lisa Hartling
 Affiliations: U of A

Introduction

Childhood asthma – the most common chronic disease of childhood - is a family illness. Despite abundant high quality evidence on pediatric asthma management, parents of a child with asthma continue to report receiving little to no education, resulting in unmet information needs. Identifying the information needs of parents of a child with asthma is an essential first step towards improving parental education and childhood asthma outcomes. The purpose of this qualitative study is to evaluate the information needs of parents of a child with asthma in both exacerbation (acute) and long-term (chronic care) management situations.

Methods

An Interpretive Description methodology was used. Twenty-one parents of a child with asthma from diverse socioeconomic backgrounds and at different stages of the illness trajectory were sampled from three diverse sites in Edmonton between October 2011 and May 2012. Twenty semi-structured interviews were conducted. Data were analyzed inductively using thematic analysis to identify themes within and across cases.

Results

Interviews were classified by time-since-diagnosis into three categories of: (i) inexperienced [<3 years since diagnosis]; (ii) moderately experienced [3-6 years since diagnosis]; and (iii) experienced [>6 years since diagnosis]. Extensive knowledge deficits and unmet information needs were present across cases, regardless of time since diagnosis. Disconnect between parental knowledge, perceived information needs, and information seeking behaviors were present. Preliminary themes of The Nature of Asthma, Functional versus Propositional Knowledge, and Fragmented Knowledge were identified, negatively impacting parent's ability to recognize and appropriately manage asthma in both acute and chronic management scenarios.

Conclusions

Parents of a child with asthma have extensive unmet information needs and generally lack insight into their knowledge deficits. Perceptions of asthma as an acute illness are pervasive and are reinforced by beliefs and discussions with health care providers. Strategies to effectively equip parents with requisite asthma education are urgently needed to improve management capacity and child health outcomes.

Funded by: WCHRI Graduate Studentship, WCHRI provides matched funds for M. Archibald's Canadian Child Health Clinician Scientist [CCHCSP] Doctoral Award

Abstract #: 24
 Presenter: Kareema Batal
 Supervisor: Raine Kim
 Title: Protecting children from the harmful effects of unhealthy food and beverage marketing: engaging parents in change
 Authors: Kareema Batal, Kim Raine, Shandy Reed
 Affiliations: U of A

Introduction

Research by the Alberta Policy Coalition for Chronic Disease Prevention (APCCP) and the U of A's School of Business showed that parents perceived high levels of efficacy in protecting their children from unhealthy food and beverage marketing. This study aims to understand 1) why parents feel such high levels of efficacy amidst growing evidence of marketing's manipulative effects, 2) how parents understand marketing's effects on their children, and 3) to engage parents in developing solutions to protect children from marketing.

Methods

This study employed a modified community-based participatory design using focus groups. Parents and caregivers of children were recruited through the APCCP's member network. A total of 5 focus groups were conducted with 3-6 participants per group. A semi-structured interview guide was used to guide the discussions. Participants also completed a survey on demographics and their children's media environments. Participants were exposed to 5 different advertisements that were selected from 5 themes: unhealthy food, healthy food, controversial food, mixed messaging, and child protection. Quantitative data will be analyzed through Excel while data collected from discussions will be analyzed using qualitative thematic analysis.

Results

Engaging parents in discussion around marketing to children revealed rich and diverse perspectives. Preliminary thematic analysis shows four themes: 1) concerns about marketing, where the primary concern is how marketing promotes unhealthy eating habits; 2) perceived control, where parents perceive control over their children's food choices - thus protect them from marketing - because they regularly educate their children on healthy eating; 3) parental responsibility for protecting children; and 4) the need to protect children from marketing. Surprisingly, participants did not express their desire to ban or restrict marketing to children, unlike popular literature suggests.

Conclusions

Engaging parents/caregivers in discussion around the effects of marketing on their children could be an effective tool in better understanding these issues and finding optimal solutions, although parents believe policy level changes are unattainable. Parents in this study believe that education fosters critical thinking and "common sense," both of which can protect children from the harmful effects of marketing. Educating parents on broader social factors influencing marketing may be necessary to counteract the effects of marketing.

Funded by: WCHRI Summer Studentship





Abstract #: 25
 Presenter: Lavanya Bathini
 Supervisor: Hamdy El-Hakim
 Title: Adductor paralysis in children
 Authors: Hamdy El-Hakim, Lavanya Bathini
 Affiliations: U of A

Introduction

Objective: to present a small series of the rare diagnosis of bilateral adductor laryngeal paralysis (BAAdLP).

Methods

A retrospective review of a single tertiary care practice of pediatric otolaryngology was conducted. The patients were identified from a surgical database spanning twelve years of practice. The variables documented were gender, age at presentation, co-morbid conditions, documentation of laryngeal findings on endoscopy, management and outcome. A systematic review in the literature was conducted, specifically to elucidate theories of etiology / associated conditions.

Results

Four cases (three girls and one boy) ranging from 2 months to 16 years of age, were identified. All cases were documented using rigid and / or flexible laryngoscopy. In three cases the onset was after major cardiac surgery, and acquiring a cerebro-vascular accident, while one was after a thalamic stroke. Three were managed with tube feeding.

Conclusions

The cases identified were all acquired after a central neurological insult. The profile is distinct from the congenital form previously described, though the symptom complex is identical. We believe this is the largest case series from one center ever to be reported.

Abstract #: 26
 Presenter: Rachel Flynn
 Supervisor: Shannon Scott
 Title: Understanding the factors that shape the implementation process of a clinical practice change
 Authors: Rachel Flynn, Shannon Scott, David Johnson
 Affiliations: U of A

Introduction

Clinical variation is a pervasive problem within pediatric care in Canada, resulting in unnecessary medical treatments and suboptimum child health outcomes. Clinical practice guidelines (CPGs) are tools developed to reduce clinical variation in healthcare and improve patient outcomes. However, research evidence demonstrates that the use of CPGs in clinical practice varies by condition, context and professional group resulting in unpredictable practice change. Poor implementation and ineffective implementation strategies are some of the possible causes to the varied rate of use of CPGs by healthcare professionals. There is a need for further research to provide researchers, policy makers, key decision makers and frontline healthcare staff with a deeper understanding to the problems that arise when attempting to create practice change through the implementation of CPGs.

Methods

The purpose of this research was to deepen our understanding of the factors that affect the rate of use of CPGs in clinical practice. The aim of this research was to identify the casual mechanisms and effect modifiers (barriers and facilitators) that shaped the implementation process of a CPG for the diagnosis and management of Croup. Data for this study was collected from 10 purposefully selected emergency departments (EDs) across Western Canada. Data sources included post-implementation focus groups and individual interview data from multidisciplinary healthcare professionals working within the ED setting. We used data analysis techniques developed by Glaser and Strauss, making comparisons across and within intervention types. The Ottawa Model of Research Use (Graham and Logan, 2004) also guided data analysis.

Results

Our findings demonstrated that attributes of the CPG were critical to its use in clinical practice. Specifically, participants described the ease of use of the CPG, how the CPG benefited their work and children's health outcomes, and how the CPG fit with the current practice of their work environment. In summary, this research study aids in understanding the factors that dictate the successful implementation of evidence based research to clinical practice.

Conclusions

In summary, this research study aids in understanding the factors that influence the successful implementation of evidence based research. This research attempts to reduce the gap between evidence and practice in pediatrics, and ultimately improve pediatric patient care.

Abstract #: 27
 Presenter: Megan Lukasewich
 Supervisor: Cindy Jardine
 Title: Engaging Aboriginal youth in participatory video production to prevent tobacco use
 Authors: Megan Lukasewich, K'alemi Dene School, Queen Elizabeth High School, Cindy Jardine
 Affiliations: U of A

Introduction

Evidence shows that youth may benefit from participating in tobacco control efforts as they feel empowered to act as agents of change in their community. Moreover, using social media tools with community-based participatory research can also empower youth by transforming their voices into community resources. However, youth's perspectives of being included in community-based participatory projects are not often assessed, resulting in lost, contextual input that represents their unique experiences. Exploration into why Aboriginal youth are interested in participating in and even leading health promotion programs in their communities is thus timely. The present study explored the following research question in an urban (Edmonton, AB) and remote (N'Dilo, NWT) school: What are Aboriginal youth's interests and attitudes around project collaboration and leading a social media project aimed at tobacco cessation and prevention?

Methods

We used a constructivist qualitative approach. Five in-depth, open-ended group interviews were conducted with participants (n=25) ages 13-18 years old. Using a constant-comparative method, we assessed similarities and differences around youth interests and expectations of the research collaboration.

Results

Youth were interested in the project because they wanted to influence their peers and family to quit smoking. They also saw the project as an opportunity to express their voices, which they often felt were disregarded and undervalued by adults. Youth wanted to be involved in decision-making processes within their communities and to explain to adults how they felt about tobacco use in their own words, from their own perspective. Many youth described participating in the research project as an opportunity for them to be a leader in their community. They were also excited to have the opportunity to meet and work with other Aboriginal youth who live in a very different context.

Conclusions

These results provide an in-depth understanding of Aboriginal youth's perspectives on their goals and expectations while participating in the project. This information is vital for community partners and academics to move towards achieving the goals of the project and meeting youth's expectations. Our results provide insight into why Aboriginal youth are interested in projects that promote youth as resources. In turn, we can provide youth with an opportunity to actively develop effective ways to influence change, and subsequently use these opportunities ultimately to empower youth to take an active role in community wellness.

Funded by: Canadian Institute of Health Research, U of A, Arctic Institute North America, Canadian Circumpolar Institute, and Aboriginal Affairs and Northern Development Canada

Abstract #: 28
 Presenter: Kacey C Neely
 Supervisor: Nicholas L Holt
 Title: Families' perceptions of and experiences in a pediatric weight management intervention
 Authors: Kacey C Neely, Nicholas L Holt, Amanda S Newton, Camilla J Knight, John C Spence, Kathryn A Ambler, Geoff D C Ball
 Affiliations: U of A

Introduction

The efficacy and effectiveness of parent-based intervention for managing pediatric obesity have been reported, but little is known about families' perceptions of these interventions, which are often referred to as Parents as Agent of Change (PAC) programs. The purpose of this study was to examine families' (parents' and children's) perceptions of a parent-based intervention for managing pediatric obesity.

Methods

Data were collected from 10 families (n=10 parents; n=9 children) for a total of 51 interviews that were completed before, during, and following a 16-week, lifestyle and behavioral PAC intervention.

Results

Prior to the intervention, families discussed their goals for making lifestyle changes and weight loss. However, they were concerned about their ability to initiate and maintain healthy changes. During the study, families approached making lifestyle changes according to whether they believed the primary responsibility rested with parents, children, or both; children's age and family structure impacted perceptions of responsibility. At the end of the intervention, parents reported that they valued the group setting, weekly goal-setting, and sessions on portion sizes, but recommended including children as active participants, varying session format, and reducing intervention length in the future changes.

Conclusions

PAC interventions designed to build families' self-efficacy, clarify family members' roles and responsibilities in making healthy changes, and engage children in care by including engaging and efficient sessions are likely to be viewed favorably by families.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 29
 Presenter: Chris Novak
 Supervisor: Lonnie Zwaigenbaum
 Title: Are parents' concerns predictive of later ASD diagnosis?
 Authors: Chris Novak, Lori-Ann Sacrey, Lonnie Zwaigenbaum
 Affiliations: U of A

Introduction

Background: An understanding of the development of children later diagnosed with Autism Spectrum Disorder (ASD) during the first three years of life is essential when identifying early risk markers. One method of identifying early differences in the development of ASD and non-ASD infants is by examining prospective parent concerns. **Objective:** Address the limitations of the previous prospective studies by collecting parent concern reports at numerous time points between 6 and 24 months of age, asking specific questions to address several developmental domains, and including a low-risk comparison group.

Methods

The design was a prospective longitudinal examination of parent concerns in infants at high (e.g., have an older sibling with ASD) and low (e.g., no family history of ASD) risk for developing ASD. Our sample included 71 infants placed into 3 groups based on diagnostic outcome at 3 years: low-risk non-ASD (LR, n = 19), high-risk non-ASD (HR-N, n = 31), and high-risk ASD (HR-ASD, n = 21). Infants were assessed at 6, 9, 12, 15, 18, and 24 months and parent reports were collected concerning their child's development of health, sensory, communication, motor, social skills, play and behaviour.

Results

Overall, more concerns were reported in the HR-ASD group than the HR-N and LR groups. Multivariate ANOVA on each domain resulted in significant group differences between HR-ASD and LR in Motor Control ($p = 0.026$), Repetitive Motor ($p = 0.001$), Communication ($p = 0.001$), Social/Play ($p = 0.001$). Cross-sectional analysis found significant differences in the ages in which concerns emerged in each domain. There were qualitative differences in the themes reported between the three groups.

Conclusions

The ASD children were more likely to have concerns in Motor Control, Repetitive Motor, Communication and Social/Play. The results have potential to contribute to our understanding of the early development of ASD and may aid in the development of early screening tools.

Funded by: WCHRI Summer Studentship

Abstract #: 30
 Presenter: Jeffrey Odenbach
 Supervisor: Sarah Curtis
 Title: Posttraumatic stress disorder screening in the pediatric emergency department: a systematic review
 Authors: Jeffrey Odenbach, Craig Courchesne, Sandra Campbell, Rebecca Gokiert, Lisa Hartling, Cathy Falconer, Amanda Newton
 Affiliations: U of A

Introduction

Pediatric injury is highly prevalent and has significant impact both physically and emotionally. The vast majority of pediatric injuries are treated in emergency departments (EDs), where treatment of physical injuries is the main focus. In addition to physical trauma, children often experience significant psychological trauma, which often goes unrecognized. The development of posttraumatic stress disorder (PTSD) is common, sometimes even after seemingly mild trauma. The consequences of failing to recognize childhood PTSD are stark and extend into adulthood. Currently, screening guidelines to identify children at risk for developing for these stress disorders do not exist in the pediatric emergency setting. The goal of this systematic review is to summarize evidence on psychometric properties, diagnostic accuracy, and clinical utility of screening tools that identify or predict posttraumatic stress disorder (PTSD) in children and adolescents.

Methods

Computerized databases including MEDLINE, EMBASE, CINAHL, ISI Web of Science and Psychological Abstracts/PsycINFO were searched and included MeSH headings (posttraumatic stress or acute stress), (pediatric or children) and diagnosis. After duplicate removal, articles were screened by title/abstract by two independent reviewers and potentially relevant articles were retrieved for full text review.

Results

10,415 articles were screened and an interrater reliability (kappa) score of 0.833 was calculated. 228 articles were retrieved for full text review. Screening tool characteristics; including type of instrument, number of items and administration time as well as quantitative diagnostic data (specificity, sensitivity, positive and negative likelihood/odds ratios, as appropriate) were compiled for over 20 PTSD screening tools and are presented here.

Conclusions

Numerous PTSD screening tools exist and span a wide variety of clinical pediatric settings. Although most tools are overly complex and lengthy to be suitable for ED use, a small number of simple/abbreviated tools exist and further research is warranted to determine their efficacy in the ED setting of pediatric injury.

Funded by: WCHRI Innovation Grant|Summer Studentship

Abstract #: 31
 Presenter: Shanon Phelan
 Supervisor:
 Title: Inclusion, participation, and disability: opportunities for engagement in childhood activities
 Authors: Shanon Phelan, Elizabeth Anne Kinsella
 Affiliations: U of A

Introduction

It is well established in the literature that children with disabilities are at risk for limited opportunities to participate in childhood activities. Some factors that limit participation include: parental vigilance, safety risks, lack of social supports, and discriminatory experiences. Limited opportunities to participate may negatively impact health, well-being, participation, and inclusion. The primary objective of this research was to investigate how socio-cultural factors are implicated in opportunities to participate in childhood activities for children with physical disabilities.

Methods

Case study methodology (Stake, 2006) was adopted for this research. Six children (10-12 y.o.) with a physical disability and their mothers participated. Methods included: Pediatric Activity Card Sort assessment (Mandich et al., 2004), photo-elicitation interviews with children, and semi-structured interviews with children and parents. Children took photographs of occupations representing everyday activities. The images served as a basis for photo-elicitation interviews. Each case was analyzed independently, followed by a cross-case analysis (Stake, 2006). Analysis involved the use of concept maps and drew upon grounded theory analysis techniques (Charmaz, 2006).

Results

The findings reveal examples of socio-cultural factors that shape children's opportunities to participate in childhood activities. Five conceptual categories were identified that represent socio-cultural factors implicated in shaping opportunities to participate in childhood activities: (1) Being included, (2) Risk, safety, and protection, (3) Because it's good for you, (4) Disability versus ability, and (5) Negotiating independence and dependence.

Conclusions

The findings have implications for health professionals working with children with disabilities and their families, and those interested in advocacy related to participation and inclusion.

Funded by: the Social Sciences and Humanities Research Council of Canada and the Canadian Occupational Therapy Foundation

Abstract #: 32
 Presenter: Florencia Ricci
 Preceptor: Cara Dosman
 Title: Getting physicians to screen child development: applying knowledge of a developmental screening tool throughout pediatric residency
 Authors: Florencia Ricci, Cara Dosman, Debra Andrews, Keith Goulden, Sheila Gallagher
 Affiliations: U of A

Introduction

Developmental problems are common therefore, surveillance is needed. However, physicians fail to employ sensitive screening instruments despite evidence for under-detection of delays in absence of screener use. Currently if doing any developmental surveillance, clinicians tend to use milestones of undetermined origin with lower sensitivity. This results in failure to address needs of children with developmental disorders when interventions are most effective. An ideal approach would consist of implementing a screener system, with early identification of developmental disorders, and appropriate referrals and treatment in early life. This approach must be taught to all medical trainees but historically has not been done successfully. Our project's goal is that the behavioural change of pediatric residents using a specific developmental screener throughout training will result in attitudinal change upon graduation (planning to screen in office practice).

Methods

All Year-1 pediatric residents are taught to use the PEDS + PEDS:DM screener during their developmental rotation. They have one day of high-volume practice in a general pediatric waiting room, learn how to make referrals to local early intervention services, and encouraged to use this approach throughout training.

Results

Over 26 months (2011-13), 33 residents have screened 275 children with PEDS, resulting in 55 PEDS:DM performed. "Screening Days" are well-accepted by trainees and preceptors, with participation at two sites

Conclusions

Embedding developmental screening throughout training requires collaboration between teaching staff and community pediatricians. Specific teaching, high-volume practice and opportunities for consolidating learning in ambulatory settings have begun to create attitudinal change (increased uptake of "Screening Day", requests for kits). Future evaluation includes ongoing monitoring of resident screener use and comfort level done by e-surveys and direct observation of skills in an OSCE station. Results will be compared to those of former program graduates, who had not used screeners during their training program.





Abstract #: 33
 Presenter: Erica Roberts
 Supervisor: Kate Storey
 Title: Exploring the role of the APPLE School administrator in affecting change in school culture
 Authors: Erica Roberts, Nicole McLeod, Kate Storey
 Affiliations: U of A

Introduction

Given that many chronic diseases associated with obesity develop over several years, it is imperative that healthy behaviours are instilled and sustained in early childhood. School-based health promotion initiatives have shown to be effective in addressing childhood obesity. Further confirmation, however, is needed to move towards evidence-based practice. The proposed research project explores specific aspects of a school-based health promotion initiative, the Alberta Project Promoting active Living and healthy Eating in schools (APPLE Schools). Previous evaluations of the APPLE Schools project revealed that the uncontested support of the school principal was seen as imperative for program success. Further investigation into this area is required to determine the relevance and impact of school leadership practice on the implementation and sustainability of school-based health promotion initiatives, like APPLE Schools.

Methods

Focused ethnography was used as the guiding method in this research. Semi-structured, one-on-one interviews were conducted with APPLE School administrators (n=30) in order to qualitatively explore their role in establishing a healthy school community. Interview transcripts were analyzed using latent content analysis.

Results

Preliminary analysis of administrator interviews highlighted three main findings: 1) Administrators function as key and active 'supporters' in relation to the implementation of the project. This implies that they need to show support regardless of whether they are acting as a project lead; 2) administrators, as school leaders, must value the principles behind the program and actively role-model healthy behaviors; and 3) administrators must enable students and staff to take ownership of the project. This requires that the administrator build relationships and avoid imposing external agendas in pursuit of immediate results.

Conclusions

This research aims to fill a number of gaps in order to better understand the role of the school administrator in establishing a healthy school community. Not only will this research contribute to the overall evaluation of APPLE Schools, but will also add to the evidence-base of school-based health promotion initiatives, informing research and practice. This in turn will allow for the creation of more effective interventions, leading to greater impact and improved health outcomes for children.

Funded by: WCHRI Graduate Studentship, M.S.I. Foundation of Alberta, Allan Markin

Abstract #: 34
 Presenter: Urooj Siddiqui
 Supervisor: Hamdy El-Hakim
 Title: Arytenoid dislocation in CHARGE Infants
 Authors: Hamdy El-Hakim, Farah Chowdhury, Urooj Siddiqui, Ban Tsui
 Affiliations: U of A

Introduction

Arytenoid dislocation / subluxation (AD/S) is a rare clinical problem in general, and especially so in children. There is only one previously reported case in a newborn. We present here two neonates who experienced this complication following routine intubation under general anesthesia for surgical procedures. Objective: To examine the prevalence and predisposing characteristics of children suffering from AD/S from a surgical database to address this condition in the pediatric population.

Methods

A 8.5-year, prospective surgical database of a single surgeon was searched for cases of AD/S at the Stollery Children's Hospital occurring between June 2002 and May 2013. Charts were retrieved for clinical and demographic details. A literature search on PubMed for AD/S AND intubation was completed.

Results

Two cases were identified from a total of 5345 cases. Both were CHARGE syndrome (boys). Both situations occurred after elective intubation for cardiac surgery. In both instances, unilateral partial arytenoidectomy was required to alleviate airway obstruction. From the literature search only level four evidence is available. There are no dedicated series for AD/S in children, and the mixed series do not report the children's data clearly. Repeated, emergent, and difficult intubations seem to be the likely factors which predispose to AD/S, to which children affected by CHARGE syndrome are prone.

Conclusions

Difficult, repeated, and emergent intubations seem to be the only documented predisposing factors that might have played a role leading to AD/S in these cases. It is likely that this condition is under-reported in children.

Abstract #: 35
 Presenter: Osnat Wine
 Supervisor: Alvaro Osornio-Vargas
 Title: Building a multi-stakeholder children's environmental health research agenda in Alberta
 Authors: Osnat Wine, Irena Buka, Alvaro Osornio-Vargas, Alan Day, Kathy Kovacs Burns
 Affiliations: U of A

Introduction

The Children's Environmental Health Clinic (ChEHC), operating since 1999, is engaged in Child Health and the Environment (CHE) research with the intent of optimizing children's health and well-being. As environmental determinants become a source of interest and drivers of change, the need for more focused research themes and questions related to CHE increases. In an innovative activity to develop a research agenda, ChEHC invited stakeholders from various sectors and disciplines to participate in a process where all voices could be heard and from which current and needed research themes and questions could be identified. Our objective: build a research agenda for CHE in Alberta utilizing a multi-stakeholder perspective, taken up into practice and policy.

Methods

Leading stakeholders from academia (clinicians, researchers, students) government, community and NGO's were identified and invited to participate in two stakeholder forums, in November 2012 and March 2013. 35 stakeholders participated in each. The remainder 90 invitees were included in a Global Sounding Board by electronic participation. The forums were designed to capture and prioritize main CHE themes by using engagement models i.e. World café. This process identified relevant topics and questions for research projects.

Results

3 main themes were identified (social determinants of health, environmental exposures and knowledge translation). A list of research projects/questions exploring CHE was generated e.g. how do social determinants of health, environmental changes and exposures affect health outcomes like obesity and respiratory illness? All planned projects will incorporate a knowledge translation component. Two committees were created to support the work ahead: An Advisory Board with a mandate to provide advice and guidance throughout all stages of the process, and a Core Scientific Panel providing scientific expertise. Future steps include further refinement of research questions, prioritization and approval of research projects as well as building research teams.

Conclusions

Multi-stakeholder engagement has proved successful in the initial stages of a CHE research agenda in Alberta. Key elements include building relationships among different stakeholders, giving stage to a variety of voices and most importantly, jointly contributing to building a multi-stakeholder-driven research agenda for CHE. This process could serve as a model for other research initiatives.

Abstract #: 36
 Presenter: Norazah Zahari
 Preceptor: Nee Scze Khoo
 Title: Three-dimensional echocardiography identify mechanisms of early post operative valve failure in pediatric and congenital heart disease
 Authors: Norazah Zahari, Timothy Colen, Somjate Suntratonpipat, Mohammed AlHabdan, Ivan Rebeyka, David Ross, Mohammed AlAklabi, Jeffrey Smallhorn, Nee Khoo
 Affiliations: U of A

Introduction

Three-dimensional echocardiography (3DE) is an accurate and informative imaging modality routinely used in pre-operative assessment for surgical planning. There is however little information on 3DE role in early post-operative valve failure assessment. This is a report on our 5 years experience of 3DE in early post-operative mitral/left atrioventricular valve (MV/LAVV) failure assessment, its impact on our understanding of its mechanism and the clinical decision for returning to the operating theatre for re-repair.

Methods

We retrospectively reviewed all patients chart and echo with MV/LAVV surgery between 2008 and 2012, excluding primary valve replacement. Early valve failure (EVF) is defined as moderate or greater MV/LAVV regurgitation within 30 days post repair.

Results

There were 132 MV/LAVV surgeries consisting of repaired complete AVSD (n=85), congenital MV abnormality (n= 17) and primum AVSD (n= 16). Pre operative moderate or greater regurgitation was present in 55 (42%) and post op EVF in 33 patients (25%). 3DE were performed in 22 (67%) of 33 EVF with 8 patients returning to the operating room for re-repair due to poor progress in intensive care rehabilitation. Six of 8 were infants. 3DE accurately identified mechanism of regurgitation such as suture dehiscence at base of cleft, leaflet tears and patch failure (see Figure). Four of 8 patients improved MV/LAVV regurgitation to mild or less regurgitation at follow-up (median 2 months), 3 remained unchanged and 1 who subsequently died from intractable heart failure despite improved MV/LAVV regurgitation from severe to moderate.

Conclusions

Although patient returning for re-repair of EVF were mainly driven by poor progress in intensive care. 3DE accurately identified the mechanism of early post-operative valve failure and may facilitate surgical planning and decision for re-repair.





Abstract #: 37
 Presenter: Liyan Zhang
 Supervisor: Gary Lopaschuk
 Title: Activating PPAR α prevents post-ischemic contractile dysfunction in hypertrophied neonatal hearts
 Authors: Liyan Zhang Zhang, Victoria Lam, Alda Huqi, Brandon Tanner, Arzu Onay-Besikci, Wendy Keung, Jagdip Jaswal, Ivan Rebeyka, Gary Lopaschuk
 Affiliations: U of A

Introduction

Post-ischemic contractile dysfunction is a contributor to morbidity and mortality following the correction of congenital heart defects (CHDs) in neonatal patients, and may be related to the effects of cardiac hypertrophy on energy metabolism. Increasing fatty acid β -oxidation is cardioprotective in the neonatal heart. In the current study, we investigated mechanisms that stimulating fatty acid β -oxidation with GW7647, a peroxisome proliferator activated receptor- α (PPAR α) activator, improves the post-ischemia functional recovery in neonatal hearts subjected to volume overload-induced hypertrophy.

Methods

Volume-overload cardiac hypertrophy was produced in 7-day-old rabbits, and followed by GW7647 (3 mg/kg/day) treatment for 14 days. Hearts were perfused as biventricular working preparations, subjected to 25 min of global no-flow ischemia, and 30 min reperfusion.

Results

GW7647, did not prevent the development of cardiac hypertrophy, but restored ejection fraction and post-ischemic functional recovery ($84 \pm 6\%$ vs $56.9 \pm 9\%$, $n=11$, $P<0.05$) when compared to vehicle-treated hypertrophied hearts. A decrease in the expression of myocardial CD36, an increase in the fatty acid β -oxidation occurred upon GW7647 treatment, which was concomitant with an ameliorated uncoupling between glycolysis and glucose oxidation. During this process, reduction of nuclear NF- κ B, HIF-1 α and ER stress was evident concomitant with an activation of SERCA2 and citrate synthase activity.

Conclusions

GW7647-mediated metabolic shift results in activation of SERCA2 and citrate synthase that contributes to improved myocardial contractility. Stimulating fatty acid β -oxidation may be a novel cardioprotective intervention to limit post-ischemic contractile dysfunction in neonatal patients requiring the surgical correction of CHDs.

Funded by: WCHRI Graduate Studentship|Trainee Research Grant

Abstract #: 38
 Presenter: Megan Lefebvre
 Supervisor: Maria Mayan
 Title: Adherence amongst chaos: a qualitative study to explore adherence to antiretroviral therapy
 Authors: Megan Lefebvre, Maria Mayan, Christine Hughes, Stan Houston, The Northern Alberta HIV Program
 Affiliations: U of A

Introduction

HIV/AIDS devastates the lives of millions of people worldwide. In 2011, 34 million people were living with HIV/AIDS. Successful treatment of HIV/AIDS demands strict adherence to antiretroviral therapy (ART). The Northern Alberta HIV Program (NAHIVP) has some patients that despite their "chaotic" lives (unstable housing, substance abuse) adhere to their ART. Clinic staff have asked patients how they do this, but nothing formally has been done. Consequently, the purpose of this research was to learn why HIV-positive women and men who have "chaotic" lifestyles are able to achieve consistent ART adherence.

Methods

Following the principles of community-based research, we utilized focused ethnography to interview 14 HIV-positive women and men to understand, from their perspective, why they were able to adhere to their ART. One-on-one interviews involved a 'grand tour question'; "what is your secret for taking your HIV medication?" I worked alongside NAHIVP staff and participants to interpret and analyze the data. I conducted a qualitative content analysis, meaning explanations of the data were derived from systematically identifying, coding, and categorizing patterns in the data. While we hypothesized that there would be a difference between women and men in adherence strategies (and coded from this perspective), we could not find any indications in the data to confirm our hypothesis.

Results

Our data revealed "control" was cornerstone for these individuals to maintain adherence. For some participants the nature of their "chaotic" lifestyle did not allow for control over their life circumstance. These participants saw their "chaos" and their HIV separately; they compartmentalized the two and felt they had no control over their life circumstances. These participants, however, recognized that by taking their ART they could have control over their HIV which enabled them to make additional positive life changes.

Conclusions

Our findings emphasize the relevance of interpersonal factors to adherence in a new light; "control" is not consistent with traditional views of ART adherence. The impact of a person's worldview cannot be ignored; clinicians must be aware of the extent to which patients believe they can control their HIV, which subsequently impacts their ability to appropriately take ART. As a result, clinicians should encourage patients to see adherence as a way to have some control over their lives and as such, adopt a broad perspective of adherence determinants when addressing adherence-related concerns.

Funded by: WCHRI Science Shop grant

Abstract #: 39
 Presenter: Jasdeep Mann
 Supervisor: Ing Swie Goping
 Title: Proliferative function of Bad in breast cancer
 Authors: Tim Buckland, Rachel Montpetit, Shairaz Baksh, Ing Swie Goping
 Affiliations: U of A

Introduction

Breast cancer is the most common disease diagnosed amongst Canadian women with 1 in 9 Canadian women developing it in their lifetime. Currently, taxane-based chemotherapy is provided for early and metastatic breast cancer patients; however, chemotherapeutic resistance is a major clinical problem with an estimated 50-70% of patients withstanding toxic side effects, yet receiving no benefit from treatment. Identification of biomarkers that predict patient response to taxane therapy would be a major advance in the clinical management of breast cancer. Our lab examines the pro-apoptotic protein Bcl-2-associated death promoter (Bad), a BH3-only protein of the Bcl-2 family and we have identified Bad as a strong, independent prognostic indicator for disease-free and overall survival of breast cancer patients after taxane chemotherapy. Therefore, it is critical to understand the function of Bad in breast cancer. Bad is a phospho-protein with conserved serine residues, which have been shown to regulate Bad activity. Its pro-apoptotic activity is apparent when the Ser 118 site is dephosphorylated and has the ability to bind and inhibit inhibitors of the mitochondrial apoptotic machinery. However, previous in vitro and in vivo data in our lab has suggested the Ser 118 site, when phosphorylated, causes Bad to exhibit a proliferative function instead. Understanding what determines the phosphorylation status or opposing functions of Bad is the objective of this project.

Methods

Stable cell lines expressing three Bad mutants (S118A, S118D, and S99A/S118D) in the MDA-MB-231 breast cancer cell background were created to directly test the functional role of phosphorylation at S118. These experiments include cell count assays to examine differences in proliferation, co-immunoprecipitation experiments to examine Bad-binding partners, and western blot analysis of the phosphorylation status of Bad. As well, in vivo tumor growth assays were performed.

Results

Our results indicated that phosphorylation of Ser 118 on Bad is important for proliferation, as well as downstream phosphorylation of other conserved serine residues, Ser 75 and Ser 99. Co-immunoprecipitation experiments indicated that Ser 75 and Ser 99 are important for binding to 14-3-3 proteins; therefore, sequestering Bad into the cytosol and away from the mitochondria. Furthermore, phosphorylation of S99 was necessary for the proliferative function of Bad and this activity is associated with Bad binding to 14-3-3.

Conclusions

In conclusion, understanding the proliferative function of Bad will aid in our understanding of why patients with higher levels of Bad respond better to taxane chemotherapy. Further studies that uncover the mechanism of Bad regulation (e.g. identification of the Bad S118 kinase) and downstream mechanism of Bad proliferative activity (e.g. contribution of 14-3-3 proteins), may contribute to a more rational approach for breast cancer treatment.

Funded by: WCHRI Innovation Grant

Abstract #: 40
 Presenter: Kim-Cuong T. Nguyen
 Supervisor: Lawrence H. Le
 Title: Preferential excitation of ultrasonic guided waves in long bones: in-vitro and in-vivo studies
 Authors: Kim-Cuong T. Nguyen, Lawrence H. Le, Mauricio D. Sacchi, Edmond H.M. Lou
 Affiliations: U of A

Introduction

Around 200 million women worldwide are affected by osteoporosis. Ultrasound uses mechanical waves and is capable to measure the geometrical and mechanical properties of bones. Ultrasound guided-wave (UGW) technology has been studied for the incidence of osteoporosis because of its sensitivity to cortical thickness. UGW propagates in long bones in various modes traveling at different speeds known as phase velocities. The low-order guided modes have been consistently observed in in-vivo studies. Being able to excite these modes alone will facilitate the study greatly. The objective of this study is to investigate the beam steering of a phased array (PA) ultrasound system to selectively excite and illuminate the UGW modes for bone assessment.

Methods

In-vitro experiments on a porcine bone and in-vivo experiments on a human tibia were performed using a 2.25-MHz 64-element PA system with axial transmission configuration. Five elements were considered as an element group to facilitate the beaming at large steering angles and enhance the penetrating power. The first group was used as a stationary transmitter while the rest were used as receivers. The transmitter and receivers were steered in sync at five different angles: 00, 200, 300, 400, and 600.

Results

The excited bandwidth of the UGW phase velocity spectrum changed with steering angle. The 00 beam excited many guided modes and had no discriminating power. When the steering angle increased, the amplitudes of the fast-traveling modes decreased and those of the slowly traveling modes increased.

Conclusions

UGW modal selectivity is possible by choosing larger steering angles. The acquisition time by a PA system is reduced significantly by 100 fold without any mechanical probe movement as compared to a single-transmitter-single-receiver system and problems relating to inaccurate recording transducer's coordination, patient discomfort, and patient motion are minimized if used in clinical settings.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 41
 Presenter: Jodi Wilkie
 Supervisor: Tammy Bungard
 Title: A case series of LMWH use in pregnancy: should trough anti-Xa levels guide dosing?
 Authors: Michelle Berresheim, Jodi Wilkie, Kara Nerenberg, Tammy Bungard
 Affiliations: U of A

Introduction

Pregnancy is a thrombogenic state, placing women at risk for venous thromboembolism (VTE) and increasing the thrombotic risk amongst those with mechanical heart valves (MHVs). While low molecular weight heparins (LMWHs) are dosed based on weight outside of pregnancy, data in pregnant women with MHVs shows that weight-based dosing does not consistently achieve therapeutic levels of anticoagulation. In this high risk group, our practice includes titrating LMWH doses to target both trough and peak anti-Xa levels, while for those with VTE, peak anti-Xa levels guide our dosing.

Methods

This retrospective case series included pregnant women requiring treatment doses of LMWH with a minimum of 3 peak (+/- trough) anti-Xa levels monitored by our clinics. Our primary objective was to describe the actual LMWH dose required to achieve targeted peak/trough anti-Xa levels relative to weight based dosing in patients with MHVs. Secondly, we compared the same for VTE patients (weight vs peak anti-Xa guided), compared actual dosing between those with MHVs and VTE, and reported maternal and fetal outcomes.

Results

Women with MHVs (N=4) required greater than weight-based dosing of LMWH (1.35 mg/kg) to achieve therapeutic anticoagulation during pregnancy, and achieving target peak anti-Xa levels did not ensure maintenance of minimum trough levels (P=0.026). Pregnant women with acute VTE (N=12) did not require increased LMWH dosages to sustain target peak anti-Xa levels. Patients with MHVs received more LMWH than VTE patients (1.35mg/kg vs 0.96 mg/kg, respectively; P<0.001). No bleeding or clotting complications were linked to LMWH administration.

Conclusions

In women with MHV's at high-risk of thromboembolism, our data supports the use of both trough and peak anti-Xa levels over weight based dosing to ensure a minimal level of anticoagulation (via the trough) to reduce thrombotic risk, and a maximum upper level (via the peak) to minimize bleeding. While our data supports standard weight-based dosing in the acute VTE population, we encourage clinicians to apply this evidence on a case-by-case basis with consideration for targeting the mid-point of the wide anti-Xa range of 0.5-1.0U/mL. Larger prospective outcomes studies are needed to provide insight into the optimal dosing and monitoring strategies for these high-risk pregnant women.

Abstract #: 42
 Presenter: Satvinder Ghotra
 Supervisor: Jerome Yager
 Title: Age at stroke onset influences the long term clinical outcome and health related quality of life after pediatric stroke
 Authors: Satvinder Ghotra, Jeffrey Johnson, Weiyu Qiu, Jolene Medynski, Jerome Yager
 Affiliations: U of A

Introduction

Since stroke in pediatrics occurs at different developmental time frames, it may potentially affect the mode and extent of brain injury and possibly, the clinical outcome and recovery. Hence, in this study, we sought to evaluate the influence of age at stroke onset on the long term neurological outcome and health related quality of life (HRQL) of pediatric arterial ischemic stroke (AIS) survivors.

Methods

A cross-sectional study at the Stollery Children's Hospital, Edmonton. Parents of children diagnosed with pediatric AIS since January 2003 were approached. Inclusion criteria: (1) age >2years at the time of follow up, (2) at least 1 year follow up after childhood stroke, and (3) 2 years follow up after perinatal stroke. Exclusion criteria: underlying genetic syndromes. Neurological outcome was assessed using the Pediatric Stroke Recovery and Recurrence questionnaire. HRQL was evaluated using proxy report (2-18 years) versions of the Pediatric Quality of Life Inventory (PedsQL 4.0) and compared to reference population norms.

Results

Ninety AIS patients (Neonatal=40%(36), presumed perinatal=34%(31) and childhood=26%(23)) were enrolled. Median age at the onset of stroke was 0.5days and 3.7years in neonatal and childhood stroke patients respectively. Median time elapsed since stroke was comparable in all the three categories (neonatal=4.2years, presumed perinatal and childhood=4.1years each). The three groups varied significantly in terms of their clinical presentation, underlying risk factors, size and site of stroke and the vascular territory involved. Patients with in-utero stroke demonstrated the worst global (p=0.002) and motor outcome (p=0.001) and least independence in daily activities (p=0.001) compared to the other two groups. Parents reported the best global outcome and overall HRQL (p=0.007) after neonatal stroke.

Conclusions

We conclude that the age at stroke onset has serious and direct implications relating to the long term clinical outcome and HRQL of pediatric stroke survivors. We further conclude that in-utero stroke patients should be considered as high risk groups and further research into this area should be conducted so that the potential morbidity could be averted.

Funded by: WCHRI Graduate Studentship

Abstract #: 43
 Presenter: Stuart Astbury
 Supervisor: Rhonda Bell
 Title: A high fructose diet during pregnancy significantly affects intestinal development in the offspring
 Authors: Aleida Song, Brent Nielsen, Nicole Coursen, Abha Hoedl
 Affiliations: U of A

Introduction

Excess caloric load or a proinflammatory diet may contribute to gut barrier dysfunction, leading to components of the microbiota passing into the systemic circulation. These effects have been linked to the development of obesity and metabolic syndrome. Maternal diet and diabetes in pregnancy have been shown to adversely affect many aspects of offspring development. This study examined the effect of a high fructose diet during gestation on gut permeability in female, pregnant offspring.

Methods

Female Wistar rats were placed on either 10% fructose or distilled water at 8 weeks of age and were mated at 10 weeks, with diet continuing through gestation. Offspring rats were then continued on the same diet as their dams (c, n=10 and f, n=10) starting from 1 week post-weaning, these offspring rats were then mated at 10 weeks of age, with tissue collected at gestational day 20. Body composition was determined by MRI directly prior to euthanasia. Ileum and jejunum sections were taken from the small intestine and snap-frozen. Total RNA was extracted for qPCR. Three epithelial tight junction genes were used as markers of intestinal permeability: occludin (OCLN), claudin-3 (CLDN3) and zonulin-1 (ZO-1). Gene expression was measured relative to GAPDH and RPLP0. Groups were compared using t-test or Mann-Whitney U test as appropriate. All values are mean±SEM.

Results

Birth weight was significantly reduced in the f group (c=4.23g±0.5 vs f=3.94g±0.8, p<0.05). Weights at GD20 were not significantly different between diet groups, however percentage lean and percentage fat mass was significantly affected by diet (percentage lean c=75.8±0.3 vs f=71.4±1.0, p<0.05 and percentage fat c=11.4%±0.5 vs f=16.8%±1.3, p<0.01). Gut length was significantly reduced in the f group (c=128.5cm±1.8 vs f=123.8cm±0.4, p<0.05).

A significant downregulation (p<0.05) in ZO-1 (c=1.64±0.28 vs f=0.64±0.09), OCLN (c=1.27±0.15 vs f=0.51±0.09), but not CLDN3 (c=1.09±0.19 vs f=2.15±0.45), was observed in the jejunum. No differences were seen in the ileum.

Conclusions

A high-fructose diet during pregnancy may adversely affect gut development in the offspring via increasing intestinal permeability, potentially allowing components of the microbiota to pass into the systemic circulation. It is unclear whether this is caused by the fetal growth restriction, an effect of the fructose diet on the microbiota, or a combination of these effects. Further research will examine the role of diet in intestinal permeability in the mother, how the microbiota changes throughout pregnancy, and how a high-fructose diet may modulate these changes.

Abstract #: 44
 Presenter: Raie Bekele
 Supervisor: David Brindley
 Title: Tamoxifen induces tumor regression independent of the estrogen receptor through oxidative stress induced ceramide synthesis
 Authors: Raie Bekele, Xiaoyun Tang, Si Mi, Jonathan Curtis, David Brindley
 Affiliations: U of A

Introduction

Tamoxifen is one of the most effective drugs in combating breast cancer. It has contributed significantly to the reduction in mortality in 75% of breast cancer patients that have estrogen receptor- α (ER α) tumors. However resistance to tamoxifen treatment is common in about 40% of patients. ER α belongs to a class of ligand activated transcription factor and after binding to estrogen, it translocate to the nucleus leading to transcription of genes involved in proliferation. Tamoxifen is thought to act by competing with estrogen for binding to ER α and leading to repression of nuclear translocation. Nevertheless, our studies and those of others show that tamoxifen can exert its effects independently of ER α . Hypothesis: Tamoxifen through induction of oxidative stress and apoptotic lipid ceramide induces cell killing independent of the estrogen receptor.

Methods

MTT reduction assay, phase contrast microscopy, crystal violet staining and PARP cleavage were used to assess tamoxifen-induced killing. Cell proliferation was measured by Countess@Automated Cell Counter. Tamoxifen-induced oxidative stress was assayed by western blotting of proteins conjugated with 4-hydroxyneonal. Mass spectroscopy was used to quantify the levels of the different ceramide species in cells.

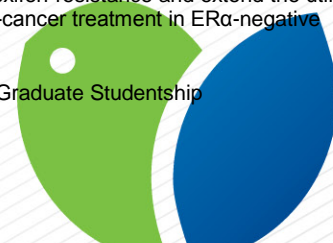
Results

Similar concentrations of tamoxifen, N-desmethyltamoxifen and 4-hydroxytamoxifen killed ER α -positive and ER α -negative human and mouse breast cancer cells to the same extent. Furthermore, tamoxifen increased lipid peroxidation as indicated by production of 4-hydroxyneonal independently of ER α . This led to the activation of stress activated protein kinases (JNK-1 and-2) and increased accumulation of the pro-apoptotic ceramides (C-16, C-18, C-20 and C-22). These ceramides cause cytochrome C leakage from mitochondrial leading to caspase activation, PARP cleavage and apoptosis. We are now determining if tamoxifen produces similar signaling effects leading to tumors regression in a mouse breast cancer model. This involves the orthotopic injection of 4T1 mouse breast cancer cells, which do not express significant ER α , into the mammary fat pad of female mice.

Conclusions

Tamoxifen, in addition to effects on ER α , causes oxidative stress, and increases in ceramide levels, which promote an apoptotic signaling cascade. Implications for Research and Practice: Our work identifies a novel signaling cascade whereby tamoxifen kills cancer cells independently of effects on ER α . We are now determining how changes in this apoptotic signaling cascade contribute to tamoxifen-resistance. We hope to learn how to overcome the development of tamoxifen-resistance and extend the utility of tamoxifen as an anti-cancer treatment in ER α -negative cancers.

Funded by: WCHRI Graduate Studentship





Abstract #: 45
 Presenter: Michael Bording-Jorgensen
 Supervisor: Eytan Wine
 Title: Characterizing the role of IL-1 β in macrophage handling of *Citrobacter rodentium* infection
 Authors: Michael Bording-Jorgensen, Richard Chan, Yuefei Lou, Misagh Alipour, Eytan Wine
 Affiliations: U of A

Introduction

NLRP-3 inflammasome leads to release of interleukin (IL)-1 β , a proinflammatory cytokine, from macrophages through processing by caspase-1. *Citrobacter rodentium* is a Gram-negative bacterium used as a mouse model for studying human Enterohemorrhagic *Escherichia coli* and bacteria-induced intestinal inflammation. We have shown that the inflammasome is protective in mice but mechanisms remain unclear. Our hypothesis is that IL-1 β is required for macrophages to detect, phagocytose, and kill *C. rodentium*.

Methods

RAW 264.7 and J774A.1 macrophages were infected with *C. rodentium* and the gentamicin protection assay was used to determine phagocytosis and bacterial killing. Nigericin (20 μ M; NLRP-3 activator) was utilized to stimulate endogenous IL-1 β production; cytochalasin D (2.5 μ M) was used as a negative control to prevent phagocytosis; and YVAD (25 μ M) as a caspase-1 inhibitor. Peritoneal macrophages from caspase-1 $^{-/-}$ mice were infected to establish effects of IL-1 β on phagocytosis. Polarized epithelial (CMT-93) cells, grown in transwells, were employed for in vitro experiments to study the interplay between macrophages, bacteria, and epithelium, analyzed using fluorescent microscopy.

Results

Macrophage engulfment of bacteria started by 5 minutes (97.5 CFU/ml), and then increases gradually until 60 minutes (3.18 x 10⁵ CFU/ml), after which the number remained constant, indicating early uptake of bacteria. When Nigericin was added the number of bacteria decreased, suggesting improved killing with inflammasome stimulation. IL-1 β appeared to enhance macrophage activity, as in the presence of epithelial cells, IL-1 β (10 ng/ml) treatment increased macrophage migration through the epithelial monolayer.

Conclusions

Our data suggest that phagocytosis of *C. rodentium* by macrophages is an early event and that inflammasome stimulation improves bacterial killing. IL-1 β facilitates the ability of macrophages to traverse the epithelium, further supporting its role in clearance of bacteria. Together, these findings indicate that improving inflammasome and IL-1 β activity in macrophages could reduce infection and microbe-induced intestinal inflammation.

Funded by: AIHS and the IBD Consortium

Abstract #: 46
 Presenter: Stephane Bourque
 Supervisor: Sandra Davidge
 Title: Prenatal hypoxia programs long-term endothelin-1 signaling and hypertension in aged offspring
 Authors: Stephane Bourque, Sandra Davidge
 Affiliations: U of A

Introduction

Prenatal hypoxia is associated with long-term alterations in vascular function in adult offspring, characterized by diminished nitric oxide (NO) signaling and enhanced responsiveness to vasoconstrictors. Here, we tested the hypothesis that prenatal hypoxia would lead to increased endothelin-1 (ET-1) function in the vasculature of adult offspring, and this would underlie a hypertensive phenotype.

Methods

Pregnant Sprague-Dawley rats were exposed to 11% O₂ from gestational day 15-21; controls were maintained at 21% O₂ throughout pregnancy. Hypoxia in maternal, fetal and placental tissues was assessed by immunofluorescence on gestational day 20. At 14 months of age, offspring vascular responses to bET-1 and ET-1 were assessed by wire myography; vascular tissue levels of bET-1 and ET-1 were assessed by immunofluorescence; blood pressures were assessed by tail-cuff plethysmography and indwelling arterial catheters.

Results

Maternal exposure to 11% O₂ during the last week of gestation caused increased expression of placental and fetal HIF-1 α , as well as increased pimonidazole (hypoxyprobe-1) staining. Fetal hypoxia caused asymmetric growth restriction in the offspring (-11%, P<0.05), concomitant with reduced placental weights (-15%, P<0.05). At 14 months of age, male, but not female, IUGR offspring had increased bET-1 conversion to active ET-1 (+179%, P<0.01), and this enhanced constriction was normalized by nitric oxide synthase inhibition with L-NAME. Vascular tissue expression of bET-1 and ET-1 were elevated in both male and female IUGR offspring (P<0.05 for all parameters). Finally, male, but not female, IUGR offspring had elevated blood pressure (+18 mmHg, P<0.01), and had greater hemodynamic responsiveness to the ET_{A/B} receptor antagonist tezosentan (10mg/kg; control: -3.58 mmHg; IUGR: -9.32 mmHg; P<0.01).

Conclusions

These results suggest bET-1 conversion to active ET-1 is altered by prenatal hypoxia, and underlies a hypertensive phenotype. Furthermore, these results implicate ET-1 in the sexually dimorphic effects of prenatal hypoxia on long-term cardiovascular function.

Funded by: WCHRI Retention Funding|Trainee Travel Grant

Abstract #: 47
 Presenter: Silvia Pagliardini
 Supervisor:
 Title: Cholinergic modulation of paraFacial respiratory group neurons
 Authors: Rozlyn Boutin, Silvia Pagliardini
 Affiliations: U of A

Introduction

Breathing is an essential behavior for mammalian life that is controlled by neuronal networks located in the brainstem. The brainstem region of the paraFacial Respiratory Group (pFRG) has been proposed to be critical for expiratory rhythm generation. The major expiratory muscles in mammals are the abdominal (ABD) muscles that, if active during expiration, force air out of the lungs below its resting level (i.e., active expiration), facilitate the subsequent INS phase and thereby promote ventilation. We previously demonstrated that active recruitment of expiratory muscle activity occurs during periods of REM in natural sleep and in REM-like states under urethane anesthesia. In this study, we tested the hypothesis that cholinergic transmission, which is potentiated in periods of REM sleep, is involved in the generation of expiratory activity in urethane anesthetized rats. Since brain activation during REM epochs and REM-like states is characterized by an increase in acetylcholine release we hypothesized that ABD recruitment is elicited by cholinergic mechanisms at the level of the pFRG.

Methods

Adult rats were anesthetized with urethane (1.5mg/kg), vagotomised, and EMG electrodes were implanted in the diaphragm, genioglossus and ABD muscles. Tracheotomy was performed to measure inspiratory and expiratory airflow.

Results

Local application into the pFRG of the Acetylcholinesterase enzyme inhibitor Physostigmine (1mM and 5mM), which increases endogenous Acetylcholine levels, increased ABD EMG activity as well as tidal volume. Local application into the pFRG of carbachol (10mM), a muscarinic agonist, induced potent recruitment of ABD EMG activity, expiratory flow and consequent tidal volume. This effect was completely inhibited by pre-application of the muscarinic antagonist scopolamine (10mM) and reversed by a 2hr washout.

Conclusions

These results demonstrate that cholinergic muscarinic transmission contributes to excitation of pFRG neurons and promotes active recruitment of ABDEMG activity and expiratory flow.

Funded by: WCHRI and NSERC

Abstract #: 48
 Presenter: Alison Care
 Supervisor: Sandra Davidge
 Title: Effect of advanced maternal age on pregnancy outcomes in the rat
 Authors: Alison S. Care, Stephane L. Bourque, Sandra T. Davidge
 Affiliations: U of A

Introduction

The age at which women deliver their first child has increased steadily in recent years, particularly in Western societies. Today, 18.3% of total live births in Canada are from women of an advanced maternal age (≥ 35 years), which are associated with increased maternal and perinatal morbidity and mortality. Little is known about the impact of aging on vascular adaptations to pregnancy that might compromise pregnancy outcome. We hypothesize that maternal cardiovascular adaptations to pregnancy will be impaired in rat dams of advanced maternal age.

Methods

Female Sprague Dawley rats aged 9 months (approximately equivalent to a 35 year old woman), and 4 months (young controls) were mated, and systolic blood pressure was measured using tail cuff plethysmography in mid- and late-gestation (gestational day (GD)14 and 19). On GD20, fetal biometrics were taken and uterine artery function was assessed using wire myography.

Results

Systolic blood pressure was increased on GD19 in aged rats compared to young rats (young= 108.8 ± 5.1 vs. aged= 131.4 ± 5.8 mmHg, P0.05). Aged dams had a reduced capacity to carry viable pregnancies (young=90% vs. aged=50%), and had reduced litter sizes (young= 15.0 ± 0.57 vs. aged= 8.5 ± 1.6 pups, P0.01) on GD20. Fetuses from aged dams had a reduced body weight at GD20 (young= 3.78 ± 0.1 g vs. aged= 3.19 ± 0.2 g, P0.05) as well as an increased crown-rump length:abdominal girth ratio – indicative of asymmetric fetal growth restriction (young= 0.97 ± 0.0 vs. aged= 1.04 ± 0.0 , P0.05). Moreover, fetal:placental weight ratios in aged dams were reduced (young= 7.32 ± 0.3 vs. aged= 5.65 ± 0.3 , P0.01), indicating a reduced placental efficiency. Uterine arteries showed a reduced maximal response to phenylephrine in aged dams (EMAX young= 14.38 ± 0.9 mN/mm vs. aged= 11.44 ± 0.5 mN/mm, P0.05), although there were no changes in endothelium-dependent relaxation.

Conclusions

Advanced maternal age was associated with elevated maternal blood pressure and a reduced contractile capacity in uterine arteries. Litter size was reduced and fetal growth restricted. Future studies will address the impact of such perturbations on the health of offspring later in life.

Funded by: WCHRI Retention Grant





Abstract #: 49
 Presenter: Eric Chalmers
 Supervisor: Edmond Lou
 Title: Predicting the outcome of brace treatment for Scoliosis: a machine learning approach
 Authors: Eric Chalmers, Edmond Lou, Vicky Zhao
 Affiliations: U of A

Introduction

Adolescent Idiopathic Scoliosis (AIS) is a spinal deformity affecting 2-3% of adolescents, with 70% of patients being girls. Brace treatment attempts to prevent progression (worsening) of the condition, and is the most common non-surgical treatment. Health care providers must estimate patient's risk of progression when making treatment decisions. Established guidelines for estimating this risk focus on untreated Scoliosis; less work has been done to estimate risk for braced patients. We present two computer models for predicting progression in braced patients, and evaluate their performance.

Methods

Records were obtained for 62 AIS patients who finished brace treatment, each including 14 clinical measurements. These records were labelled 'progressive' if the patient's Scoliotic curve had progressed 6° or more, and 'non-progressive' otherwise. The data was used to develop two prediction models: a logistic regression model and a custom fuzzy-logic-based model. 28 additional braced patient records were used to test the models' predictions: prediction accuracy, correlation between predictions and actual outcome, sensitivity, and specificity were measured.

Results

The best logistic regression model used 2 of the 14 clinical measurements to predict progression. The fuzzy logic model used 4. The logistic regression and fuzzy models had prediction accuracies of 75% and 82% respectively. The correlations between predicted and actual progression were 0.52 and 0.70. Sensitivity and specificity were 83% and 69% for the logistic regression, and 100% and 69% for the fuzzy model.

Conclusions

This work revealed some interesting facts. One of the clinical measurements (not previously viewed as having much prognostic value) was an important predictor in both models. Also, the fuzzy model showed better aptitude for this task, suggesting typical linear statistical analyses may be too simple to investigate this domain. Future work will further develop the fuzzy model to include patient's brace wear habits as well as clinical measurements.

Funded by: WCHRI Graduate Studentship, Alberta Innovates and TD Bank

Abstract #: 50
 Presenter: Heather Edgell
 Supervisor: Joanna MacLean
 Title: Cardiovascular responses to hypoxia or hypercapnia are attenuated in children with bronchopulmonary dysplasia
 Authors: Heather Edgell, Kristie DeHaan, Desi Fuhr, Lawrence Richer, Michael Stickland, Joanna MacLean
 Affiliations: U of A

Introduction

Bronchopulmonary dysplasia (BPD) is a respiratory disorder which affects children born prematurely and defined by the need for oxygen support at 36 weeks gestational age (GA). BPD is associated with altered lung development, greater risk respiratory illness and reduced long term lung function. Less is known about cardiovascular control in BPD. Adults with chronic respiratory conditions, such as chronic obstructive pulmonary disease, are known to have impaired autonomic and cardiovascular control.

Methods

Twenty-four children aged 8-12 years were recruited for this study; 9 were born extremely preterm (28 weeks GA; preterm group), 8 were born extremely preterm and had BPD (BPD group), and 7 were healthy and born at term (control group). Blood pressure, ECG, pulse-oximetry (SpO₂), and end tidal respiratory gases (PETO₂ and PETCO₂) were monitored during testing while subjects were breathing through a mouthpiece. Oxygen concentration was dropped to lower the SpO₂ to 85% for 3 minutes. After a brief rest, participants were asked to hyperventilate for 5 minutes to reduce PETCO₂ to 30mmHg. Participants then were switched to breathe a gas mixture from a bag to gradually increase PETCO₂ to >45mmHg while PETO₂ was maintained at 50mmHg. The slope of the relationship between PETCO₂ to blood pressure and heart rate was determined by graphing breath-by-breath averages during the rebreathe protocol.

Results

Blood pressure and heart rate responses to hypoxia differ by group: control (Δ BP: $+3.8 \pm 1.4$ mmHg, $p=0.03$; Δ HR: $+9.6 \pm 3.0$ bpm, $p=0.02$) and preterm children (Δ BP: $+6.1 \pm 1.8$ mmHg, $p=0.01$; Δ HR: $+15.8 \pm 2.9$ bpm, $p=0.001$) showed a significant increase of both blood pressure and heart rate in response to hypoxia which was absent in BPD children (Δ BP: $+0.2 \pm 2.2$ mmHg, $p=0.9$; Δ HR: $+4.2 \pm 3.0$ bpm, $p=0.2$). Similarly, the relationship between change in PETCO₂ and blood pressure was significantly reduced in BPD children compared to pre-term and control children (Control: 2.1 ± 0.8 ; Preterm: 1.1 ± 0.2 ; BPD: 0.1 ± 0.3 mmHg MAP/mmHg PETCO₂; $p=0.03$). The heart rate response to hypercapnia did not differ by group.

Conclusions

Cardiovascular control is impaired in children with BPD compared to both preterm and control children. Attenuated sympathetic output as a result of reduced chemosensitivity may be responsible for the impaired blood pressure response in children with BPD.

Funded by: WCHRI Innovation Grant, CIHR

Abstract #: 51
 Presenter: Eun-Young Lee
 Supervisor: John Spence
 Title: Does pubertal timing matter? The association between pubertal timing and health indicators in adulthood
 Authors: Eun-Young Lee, John C. Spence
 Affiliations: U of A

Introduction

Early Maturation or Early Timing hypothesis suggest that early maturers are at particular risk for psychological problems and engagement in unhealthy weight control behaviours compare to average- or late-maturer, particularly among females. Nonetheless, there is a positive relationship between early maturation and percent of body fat. The experience of earlier maturation compared their peers in adolescence may also have an impact on health indicators including Body Mass Index (BMI), weight perception (WP), weight control behaviours, physical activity (PA) level, and Quality of Life (QoL) in adulthood.

Methods

The current study aimed to examine the association between pubertal timing, BMI, WP, weight control behaviours, PA level, and QoL among 1,886 female Korean adults aged between 19 to 50 year old who participated in the 2010 Korea National Health and Nutrition Examination Survey (KNHNES).

Results

Adults who experienced advanced maturation in adolescence showed higher BMI ($p = .029$), negative WP ($p = .000$), unhealthy WCB such as skipping meals ($p = .014$), lower moderate PA level ($p = .414$), and lower QoL compared to adults who experienced puberty on average time. Interestingly, adults with advanced maturation perceived their weight as overweight more often than average- or late-matured adults while the highest average BMI score were observed in late maturers.

Conclusions

The study results suggest that the biological maturation may be a strong determinant of health indicators not only in adolescence but also in adulthood. Special attention on adolescents with different pubertal timing is warranted to help address the issues related to puberty and psychological weight-related coping mechanisms in this particular population.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 52
 Presenter: Emma Hjartarson
 Supervisor: Sandra Davidge
 Title: Mechanisms for impaired cardiovascular adaptations to pregnancy at an advanced maternal age
 Authors: Emma Hjartarson, Alison Care, Jude Morton, Sandra Davidge
 Affiliations: U of A

Introduction

The average age at which women deliver their first child is increasing. Advanced maternal age (≥ 35 years) is associated with increased maternal and fetal mortality. It is an independent risk factor for preeclampsia, which is characterized by hypertension and proteinuria. Effects of aging include reduced cardiovascular compliance and impaired endothelial-dependent function. Thus, normal vascular adaptations to pregnancy may be impaired in the aged maternal cardiovascular system. We have shown that lectin-like oxidized low-density lipoprotein (LDL) receptor-1 (LOX-1), a membrane receptor that binds oxidized LDL, is increased in the systemic vasculature of preeclamptic women. We hypothesized that elevated LOX-1 expression may be a mechanism for increased oxidative stress and impaired vascular adaptations to pregnancy at advanced maternal age.

Methods

Sprague Dawley rats were mated at either 9 months (~ equivalent to 35 year old women) or 4 months (young controls) of age. On gestational day (GD) 20 systolic blood pressure and fetal biometrics were measured. LOX-1 abundance in thoracic aortae was quantified by Western blot. In addition, oxidative stress was measured by nitrotyrosine (a peroxynitrite marker) immunohistochemistry and dihydroethidium (a superoxide probe) staining. Pressure myography was used to assess differences in mesenteric artery stiffness between groups.

Results

Aged dams carried viable pregnancies to GD 20, but litter sizes and fetal weights were reduced. Systolic blood pressure was elevated. LOX-1 expression was elevated in aortae from aged dams (young= 0.25 ± 0.01 vs. aged= 0.30 ± 0.02 arbitrary units, $P < 0.05$). Nitrotyrosine and superoxide expression were not different between groups. Preliminary myography data shows no difference in the passive responses of arteries from young and aged dams.

Conclusions

The significant increase in LOX-1 from aged dams in late gestation is a novel finding. We will now investigate the ramifications of this increase and how other factors that cause oxidative stress interact with LOX-1. Further studies will elucidate the passive characteristics of mesenteric arteries from young and aged dams.

Funded by: WCHRI Retention Funding, WCHRI Summer Studentship Grant





Abstract #: 53
 Presenter: Sandra Hodgetts
 Supervisor:
 Title: Profile and predictors of service needs in autism spectrum disorders
 Authors: Sandra Hodgetts, Lonnie Zwaigenbaum, David Nicholas
 Affiliations: U of A

Introduction

The rising prevalence of autism spectrum disorders (ASD) is straining health, education and community service systems. Tailoring supports and services to best meet families' needs could decrease burden on these systems, yet little is known about service needs from the perspective of families. This study identified: (1) overall, best and worst met service needs, and (2) predictors of total and unmet needs, for families of children with ASD.

Methods

143 parents of a child with ASD (mean age = 9.8 years) completed a survey including demographic information, the Family Needs Survey-Revised, and an open-ended question about their 'single greatest service need'. Descriptive statistics were calculated to characterize the sample, and determine the degree to which items were identified as needs and those needs were met. Linear regression was used to determine predictors of total and unmet needs. Qualitative responses were content analyzed.

Results

The most frequently identified overall needs were for information on current (82%) and future (79%) services and handling disruptive behaviours (77%), and support to find personal time (74%). The greatest unmet needs were for information on services available (61% unmet), support to find personal time (43% unmet), and locating respite care (39% unmet). Most participants reported positive experiences with the funding available for services (73-85% needs met across items) and quality of professional support (68-94% needs met across items). The most frequently identified 'single greatest service needs' were respite care (26%), planning for and availability of adult services (20%) and transparent information about services (19%). Decreased child's age and household income, disruptive behaviours, and increased maternal age predicted more total and unmet needs.

Conclusions

Information on services, handling disruptive behaviours, and parent and child respite support were key needs. However, the most frequently identified overall needs were often the greatest unmet needs. Age, disruptive behaviour and income, but not language and intellectual abilities, predicted overall and unmet needs.

Funded by: WCHRI and Canadian Child Health Clinician Scientist Program

Abstract #: 54
 Presenter: Xiaoming Jia
 Supervisor: Catherine Field
 Title: Estimated intake and sources of omega-3 long chain polyunsaturated fatty acids in a prospective cohort of pregnant and lactating Albertan women
 Authors: Xiaoming Jia, Jamie Wildgrube, Stephanie Sontag, Murphy Andrews, Nour Wattar, Fatheema Begum Subhan, Linda McCargar, Catherine Field
 Affiliations: U of A

Introduction

Maternal intake of the omega-3 long-chain polyunsaturated fatty acids (n-3 LCPUFAs) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been found to positively impact maternal and fetal outcomes. Current recommendations for n-3 LCPUFAs include Health Canada's recommendation of two servings of fish/week and the International Society for the Study of Fatty acids and Lipids (ISSFAL) recommendation of ≥ 300 mg/day DHA and ≥ 220 mg/day EPA during pregnancy and lactation. Although Food Processor, the common nutrient analysis program, has n-3 LCPUFA data on most food, the accuracy is questionable.

Objective: To develop a dietary database for EPA, DHA and docosapentaenoic acid (DPA) containing foods reported in the 24-hour recalls of the Alberta Pregnancy Outcomes and Nutrition (APrON) study and to use this database to estimate the intake and sources of n-3 LCPUFAs during pregnancy and postpartum.

Methods

24-hour dietary recalls and a supplement questionnaire were collected from 599 women in the first cohort of the APrON study at each trimester of pregnancy and three months postpartum. The created database, based on data from United States Department of Agriculture (USDA) nutrient database and the Canadian Nutrient File (CNF), was linked to the food records and combined with supplement data to estimate daily total n-3 LCPUFA intakes at each time point.

Results

Only 20% of women during pregnancy and 17% during postpartum met or exceeded the ISSFAL recommendation for EPA+DHA. When dietary intake was considered alone, only 10% of women met the ISSFAL recommendation during pregnancy and postpartum. Intakes of EPA and DHA did not change significantly throughout pregnancy, yet mean intakes (303 ± 596 mg) during pregnancy were significantly higher than at three month postpartum (256 ± 491 mg). Estimated DPA intake from Food Processor was 20-30% lower than using the created database at different time point. Seafood and seaweed products contributed to 79% of overall n-3 LCPUFA intake from foods, with the majority from salmon.

Conclusions

The majority (80% in pregnancy and 83% in postpartum) of women in the APrON cohort were not meeting the ISSFAL recommendation. Due to the small percentage of women meeting the recommendation through dietary intake alone, our results suggest that a natural health product or fortification of the food supply may be needed to help women meet current n-3 LCPUFA recommendations during pregnancy and lactation.

Abstract #: 55
 Presenter: Maysoon A. Mahmoud
 Supervisor: Monika M. Keelan
 Title: Antisense DNA: a novel approach to treat *Helicobacter pylori* infection
 Authors: Maysoon A. Mahmoud, Jelena L. Holovati, Karen J. Goodman, Monika M. Keelan
 Affiliations: U of A

Introduction

Helicobacter pylori is a bacterial infection usually acquired early in childhood, likely through fecal-oral or gastro-oral transmission. The usually asymptomatic *H. pylori* infection persists for life if left untreated, and is associated with the development of peptic ulcers and gastric cancer. Standard therapies have a >20% failure rate. Northern Aboriginal people are concerned about their families and gastric cancer because the prevalence of *H. pylori* is high (>55%) in their communities. *H. pylori* colonization of the acidic stomach environment is dependent on the production of urease, which hydrolyzes urea to CO₂ and NH₃. Antisense DNA targeted against urease gene expression is a novel strategy to inhibit the production of urease. Cationic liposomes can enhance the delivery of antisense DNA into bacterial cells. We investigated the ability of urease antisense DNA to impair *H. pylori* urease expression in the presence and absence of cationic liposomes.

Methods

Antisense DNA oligo (UBA) was designed based on the ureB gene sequence of *H. pylori* 26695, along with a scrambled sequence (scrUBA, negative control). *H. pylori* A64 (strong urease producer) was cultured on brain heart infusion-yeast extract media (pH 7.4) with 5% horse serum at 37°C under microaerobic conditions, first on agar for 24 h, then in broth for 24 h at 100 rpm with 20 nM UBA or 20 nM scrUBA ± 1.6 µM DOTAP® cationic liposomes added at 0, 6 and 10 hr. At 24 h, aliquots were taken to assess *H. pylori* growth (OD₆₀₀, cfu/mL) and cell lysate urease activity (OD₅₆₀/cfu), and to extract RNA for assessment of urease mRNA expression (real-time PCR). Urease activity was also assessed over a range of UBA and DOTAP® concentrations.

Results

UBA+DOTAP® suppressed urease activity by 40% versus untreated control, UBA or, scrUBA ± DOTAP® but did not affect *H. pylori* growth. At 4 µM UBA, urease activity was maximally inhibited by 59%. Increasing the DOTAP® concentration beyond 1.6 µM did not further increase urease inhibition.

Conclusions

Cationic liposomes successfully deliver ureB gene antisense DNA to *H. pylori* and impair urease expression at pH 7.4 without affecting growth. Impairing urease expression may decrease *H. pylori* survival under the acidic conditions of the stomach and offer a novel approach for treatment.

Funded by: CIHR, Queen Elizabeth II Graduate Student Scholarship

Abstract #: 56
 Presenter: Daniel Kerage
 Supervisor: Denise Hemmings
 Title: S1P-mediated regulation of vascular tone involves the balance between increased endothelial permeability and activation of NO pathway
 Authors: Daniel Kerage, Randi Gombos, Denise Hemmings
 Affiliations: U of A

Introduction

Cardiovascular disorders like atherosclerosis and hypertension are associated with increased endothelial (EC) permeability and vascular tone. Sphingosine-1 phosphate (S1P), a bioactive lipid, regulates EC permeability by enhancing EC barrier through S1P1 receptors, but also disrupts the barrier at high concentrations through S1P3 receptors. S1P/S1P1/3 interaction also generates nitric oxide (NO), a potent vasodilator. However, how the balance between EC permeability and bioavailable vasodilators is regulated to generate vascular tone is unknown.

HYPOTHESIS: S1P signalling will increase EC permeability but also generate NO. Permeability will permit leakage of circulating vasoconstrictors to the vascular smooth muscle cells (VSMC) increasing vascular tone that will be regulated by available NO.

Methods

A novel functional assay was used to simultaneously measure EC permeability and vascular tone using pressure myography. In this assay, a permeability factor was co-infused with a known vasoconstrictor in the presence of a 3kDa fluorescent dextran into uterine arteries from female mice. EC permeability was measured from dextran leakage to the vessel bath by fluorescence corrected by vessel length. Diameter change was used as a measure of vascular tone. S1P (0.01-10µM) was infused inside arteries with or without constrictors U46619 (5nM), in the presence of S1P1/3 antagonist 1µM VPC23019 or into arteries from S1P3 KO and wildtype mice. Experiments were also conducted in the presence of L-NAME, a NO synthase inhibitor. Constriction was compared to that obtained by adding these agents directly to VSMC in the vessel bath.

Results

Infusion of S1P (0.01-1µM), U46619 had no effect on endothelial permeability or arterial tone. However, S1P (10µM) increased both endothelial permeability and vascular tone. S1P (0.1-10µM) or U46619 added extraluminally increased constriction. Interestingly, co-infused 1-10µM S1P and U46619 increased constriction that was attenuated by VPC23019 or using arteries from S1P3 KO mice, suggesting S1P-induced permeability is S1P3-mediated. Infusion of S1P (0.01-1µM) into uterine arteries in the presence of L-NAME in the vessel bath increased endothelial permeability but also dose-dependently increased constriction, in a manner comparable to extraluminally added S1P. S1P, U46619 or a combination co-infused into uterine arteries increased permeability and vascular tone in the presence of L-NAME. However, extraluminal additions only increased constriction in response to S1P but not U46619 or a combination.

Conclusion

We have for the first time, identified a unique mechanism whereby increased vascular tone is decided by the balance between increased endothelial permeability and bioavailable NO. Uniquely, this mechanism can be mediated by S1P itself or through induced permeability allowing leakage of vasoconstrictors to the underlying smooth muscle cells. It is however promising that endothelial permeability and vascular tone can be abrogated by targeting S1P3 receptors. These results will be invaluable to the efforts needed in finding therapeutic solutions not only against cardiovascular-related complications, but also in pregnancy-related disorders such preeclampsia and IUGR.

Funded by: CIHR, NSERC and WCHRI





Abstract #: 57
 Presenter: Christen Klinger
 Supervisor: Joel Dacks
 Title: Comparative genomic and functional analysis of the fifth adaptin complex in apicomplexan parasites
 Authors: Christen Klinger, Joel Dacks
 Affiliations: U of A

Introduction

The Apicomplexa are a group of unicellular Eukaryotes, which includes organisms of medical and economic significance such as *Plasmodium falciparum* (cerebral malaria) and *Toxoplasma gondii* (congenital toxoplasmosis). Central to their pathogenic mechanism as obligate intracellular parasites is the apical complex, a set of specialized secretory organelles mediating host cell invasion and egress. We recently published a review outlining these organelles as highly derived late endocytic compartments. Thus, the biogenesis and maintenance of these organelles should bear similarities to that of lysosomes found in other taxa. These processes rely on the machinery of the membrane trafficking system, including the adaptins. Adaptins are heterotetrameric protein complexes that select cargo for packaging into transport vesicles at organelles. Traditionally there was thought to be only four adaptins, though we recently reported the existence of a fifth such complex. In the two apicomplexans studied in this initial report, one lacked the complex and the other possessed it. In this study we further investigated the conservation and function of adaptin complexes in the Apicomplexa.

Methods

Comparative genomic analysis of 16 apicomplexan genomes, as well as the genomes of six close outgroup taxa, was performed utilizing the BLAST and HMMer algorithms. Subunit identity was further assessed utilizing phylogenetic programs in the maximum-likelihood and Bayesian frameworks. Primers were designed to amplify C-terminal regions of several adaptin subunits for subsequent ligation into vectors for the LIC cloning method and transfection into *T. gondii*.

Results

Comparative genomic analysis of 16 apicomplexan genomes, as well as the genomes of six close outgroup taxa, was performed utilizing the BLAST and HMMer algorithms. Subunit identity was further assessed utilizing phylogenetic programs in the maximum-likelihood and Bayesian frameworks. Primers were designed to amplify C-terminal regions of several adaptin subunits for subsequent ligation into vectors for the LIC cloning method and transfection into *T. gondii*.

Conclusions

Apicomplexa encode a number of adaptin complexes, though specific lineages have undergone reduction from a complete ancestral set. Importantly, many organisms encode at least some subunits of the AP5 complex, which is poorly conserved in close outgroups and across Eukaryotes. This suggests that the complex plays an important role in these lineages, and prompts further study.

Funded by: WCHRI Summer Studentship

Abstract #: 58
 Presenter: Christina MacKay
 Supervisor: Margie Davenport
 Title: Exercise and brain blood flow during pregnancy
 Authors: Christina MacKay, Margie Davenport
 Affiliations: U of A

Introduction

Current guidelines emphasize the importance of exercise during pregnancy in promoting maternal and fetal health. Although exercise has clear metabolic and cardiovascular benefits, the influence of exercise during pregnancy on the cerebral circulation is virtually unknown. Our primary aim is to examine the influence of pregnancy on cerebrovascular function. In non-pregnant individuals exercise and carbon dioxide (CO₂) are potent stimulators of cerebral blood flow. We will compare cerebrovascular reactivity to exercise and CO₂ in pregnant and non-pregnant women. In addition, we will evaluate the effect of sex hormones (estrogen, progesterone and testosterone), lipids, cytokines, insulin, and glucose on the observed responses. We hypothesize that resting cerebral blood velocity will not be affected by pregnancy. Further, we hypothesize that pregnancy will increase cerebrovascular reactivity to CO₂ and exercise.

Methods

Following medical pre-screening, non-pregnant (n=10) and pregnant women, in the third trimester, (n=10) will undergo: (1) an incremental exercise test to volitional fatigue on a recumbent bike; and (2) a hyperoxic CO₂ rebreathing test. Throughout these tests participants will be instrumented for continuous measures of heart rate (electrocardiography), blood pressure (finometer), middle and posterior cerebral artery blood velocity (trans-cranial Doppler ultrasound), carotid artery diameter and flow (Doppler ultrasound) and end tidal oxygen and CO₂.

Results

A recent pilot test (n=1) demonstrated no change in resting cerebral blood velocity between pre-pregnancy and the third trimester. Further, the results showed an increase in cerebrovascular reactivity to CO₂ in the third trimester compared to the non-pregnant state. Based on these preliminary data we also expect that pregnant women will have a more robust cerebrovascular response to exercise.

Conclusions

Previous examinations of exercise induced blood flow redistribution in pregnant women have focused on blood flow to the fetal/placental unit; however, changes in blood flow distribution to other vascular beds such as the cerebral circulation during pregnancy are poorly understood. Results of this study could aid in understanding cerebrovasculature and its responses to exercise (and CO₂) during pregnancy.

Abstract #: 59
 Presenter: Hunter McColl
 Supervisor: David Eisenstat
 Title: Developmental regulation of the intestinal stem cell marker Bmi1 by the DLX2 homeobox transcription factor
 Authors: Hunter McColl, Marino Novel, Mario Fonseca, Jamie Zagozewski, David Eisenstat
 Affiliations: U of A

Introduction

Colorectal cancer is responsible for the second most deaths attributed to cancer. Mutations in the genes responsible for regulating cellular proliferation in the GI tract account for increased susceptibility to this cancer type. Within the intestinal crypts of Leiberkuhn there are two stem cell populations: a dividing set marked by the Wnt signalling receptor LGR5, and a stable, non-dividing group marked by the oncogene BMI1. The role of these cells is to maintain the epithelial cell lining of the intestine, which undergoes rapid turnover and cannot replace itself mitotically. Unpublished work from the Eisenstat lab has shown co-expression of BMI1 and the homeobox transcription factor DLX2 in the intestinal crypt. We investigated the potential for a regulatory effect of DLX2 on Bmi1, with the expectations that DLX2 suppresses Bmi1 expression throughout development and the interaction is due to direct binding of Bmi1's promoter by DLX2.

Methods

We investigated interactions between DLX2 and Bmi1 promoter regions in vivo through Chromatin Immunoprecipitation (ChIP) using a high-affinity DLX2 antibody. Electrophoretic mobility shift assays (EMSAs) in combination with Site Directed Mutagenesis of DLX2 binding sites were used to determine the direct binding of the Bmi1 promoter by recombinant DLX2 in vitro. Ongoing reporter gene assays are being used to determine the effect that DLX2 has on Bmi1 expression in vitro

Results

We demonstrated that DLX2 interacts with the Bmi1 promoter in several regions of interest in vivo. EMSA results demonstrate specific binding of DLX2 to the promoter of Bmi1 in vitro.

Conclusions

ChIP results confirm occupancy of the Bmi1 promoter by DLX2 while EMSAs demonstrate direct binding of DLX2 to the promoter of Bmi1 in vitro. Our ongoing gene expression studies will clarify the effect of this binding in vitro. Future studies, including in vivo gene expression studies comparing wild type expression in the Dlx1/Dlx2 double knockout mouse to the wild type will confirm the biological relevance of the in vitro results.

Funded by: WCHRI Start-up Funding, WCHRI Graduate Studentship

Abstract #: 60
 Presenter: Antoinette Nguyen
 Supervisor: Jerome Yager
 Title: The use of broccoli sprouts to prevent neurodevelopmental delay caused by the fetal inflammatory response
 Authors: Antoinette Nguyen, Edward Armstrong, Ashley Bahry, Jerome Yager
 Affiliations: U of A

Introduction

The Fetal Inflammatory Response (FIR), results in adverse neurological consequences such as Cerebral Palsy (CP). Epidemiological studies have suggested that FIR during late pregnancy can result in a 4-fold increase risk of CP. No therapeutic interventions exist to prevent the onset of brain injury due to difficulties targeting the fetus in utero. My research project investigates a natural health product, broccoli sprouts (BrSp), as a therapeutic intervention to prevent fetal brain injury when exposed to FIR. Broccoli sprouts contain the precursor that forms sulforaphane, a potent phase II enzyme inducer. Thus, the objective of this study is to determine whether BrSp is able to attenuate the developmental delay and reduce the inflammation and oxidative stress seen in our model of FIR.

Methods

Pregnant Long-Evans rats (dams) will be given an intra-peritoneal injection of lipopolysaccharide (LPS, 200 µg/kg in 100 µl saline) on gestational day 19 and 20, every 12 hours. Control dams will receive 100 µl of saline. Dams receiving BrSp in addition to their diet will be fed 200 mg/day beginning on gestational day 14 – post natal day 21. A total of four groups were investigated: 1) saline, 2) LPS, 3) saline + BrSp, and 4) LPS + BrSp. Rat pups born from these dams will undergo a series of neurodevelopmental reflex testing between postnatal day 3-21. Rat pups will be euthanized on postnatal day 1 and 21 for analyses in neuropathological alterations.

Results

Rat pups born from LPS exposed dams are born significantly ($p \leq 0.05$) lower in birth weights, suggesting intrauterine growth restriction. The rat pups from the LPS group also had a significant delay in several newborn neurodevelopmental reflexes tested compared to control rat pups born from saline exposed dams. Furthermore, BrSp supplementation in LPS exposed dams gave rise to rat pups were no longer significantly delayed in neurodevelopmental reflexes compared to their controls.

Conclusions

In conclusion, the study has shown that rat pups born from dams exposed to LPS have a delay in neurodevelopmental reflexes, similar to children with CP. Dietary supplementation with BrSp in dams exposed to LPS were able to prevent significant growth restriction. BrSp were able to hinder most of the neurodevelopmental delay seen in rat pup with in utero exposure to LPS. This study may be able to show that BrSp supplementation during pregnancy may be a potential neuro-protective primary prevention against the FIR.

Funded by: WCHRI Trainee Travel Grant, NCE NeuroDevNet, Alva Foundation, Heart & Stroke Foundation





Abstract #: 61
 Presenter: Katherine Pohlman
 Supervisor: Sunita Vohra
 Title: Validation of a patient safety attitudes survey for spinal manipulation therapy providers
 Authors: Katherine Pohlman, Sana Ishaque, J David Cassidy, Maeve O'Beirne, Sunita Vohra
 Affiliations: U of A

Introduction

Most patient safety initiatives take place in hospitals and other medical settings. Yet, the majority of patients seek spinal manipulation therapy in chiropractic and physiotherapy clinics. The aim of this project is to develop and implement a plan to revise and validate a medical office patient safety attitudes survey for spinal manipulation providers.

Methods

A four-stage approach was taken to develop and validate our survey for the target population: 1) Literature Review; 2) Expert Review; 3) Initial Validity Testing; and 4) Advance Validity Testing.

Results

Stage 1: Literature Review) There were approximately eight instruments/surveys in the literature that rigorously assessed patient safety attitudes that were found appropriate for our purpose. Stage 2: Expert Review) All eight surveys were reviewed by the investigators (n=5) and team members (n=19). Discussion occurred through teleconferences, e-mails, and in-person meetings over eight months until one instrument was chosen, the Agency for Healthcare Research and Quality (AHRQ) Medical Office Survey on Patient Safety Culture. This instrument was first developed as a Hospital Survey on Patient Safety Culture and was then revised and reassessed for allopathic medical offices, as well as Nursing Homes and Pharmacies. Stage 3: Initial Validity Testing) The survey was revised for our target population. This included the removal of the word "medical" and adding a specific spinal manipulation therapy section to the list of patient safety and quality issues. Based on investigators' opinions, questions regarding developing and implementing a reporting and learning system were also added. Stage 4: Face and Content Validity Testing) The revised survey was assessed by all team members (physiotherapy, chiropractic, and medical physician experts; n=22) and a small sample of our target population (n=10). This is a five-year project in which this survey will be conducted yearly and will be further tested for reliability, internal consistency, and construct validity. Later on, we intend to use the survey to document changes and responsiveness in patient safety attitudes and potential changes in culture necessary to evaluate overall performance of the project. The protocols for the other stages of study are currently being developed.

Conclusions

Creating a patient safety culture for spinal manipulation therapy is important; however, to know if this culture exists or has been enhanced, there is a need to have a reliable and valid instrument to measure it. The validation of a patient safety attitudes survey for spinal manipulation therapy constitutes a first step toward measuring the patient safety culture in spinal manipulation therapy.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 62
 Presenter: Sarah Post
 Supervisor: Denise Hemmings
 Title: A novel pathway through which 17β -estradiol effects dilation in uterine vasculature
 Authors: Sarah Post, Daniel Kerage, Denise Hemmings
 Affiliations: U of A

Introduction

Estrogen is essential to a healthy pregnancy, playing a critical role in vascular adaptations that increase dilation capacity. Lack of appropriate adaptation can result in hypertension and reduced blood flow to the fetus, leading to pathologies such as preeclampsia and intrauterine growth restriction. Sphingosine 1-phosphate (S1P), a bioactive lipid, is an important regulator of angiogenesis, cardiovascular development and vascular tone, all of which are important in pregnancy. S1P is produced by sphingosine kinase (SK) intracellularly and is then translocated from the cell into the blood stream, where it binds to cell surface S1P1/S1P3 receptors in an autocrine/paracrine manner. This binding activates endothelial nitric oxide synthase (eNOS) and increases production of nitric oxide (NO), a potent vasodilator. Studies in cancer cells report signaling by 17β -estradiol (E2) through the GPR30 receptor, activating the S1P pathway leading to cell migration and angiogenesis. What we don't know is if E2 uses this same pathway in the uterine vasculature. We hypothesized that E2 activates SK through GPR30 to increase S1P and induce dilation through S1P receptors in uterine arteries.

Methods

A pressure myograph system was used to measure change in uterine artery diameter after infusion of E2 with and without inhibitors inside a pressurized artery precontracted with U46619, a thromboxane mimetic. We used S1P3 knockout (KO) mice and their littermate controls to determine the importance of S1P in this pathway.

Results

E2 infused into the KO uterine artery produced greater dilation (90.8 ± 3.6) compared to the control (65.0 ± 11.9). Co-infusion of E2 with VPC23019 to block S1P1/S1P3 receptors, significantly inhibited dilation in the control (-1.9 ± 5.1), compared to the KO (58.3 ± 11.0).

Conclusions

These data suggest that E2 mediates at least some of its dilation effects through the S1P pathway. Further studies of the mechanisms by which E2 induces dilation through this novel pathway and its role in pregnancy will provide new targets for therapeutic interventions.

Funded by: CIHR

Abstract #: 63
 Presenter: Joel Strautman
 Supervisor: Francois Bolduc
 Title: The *Drosophila* gene spastin is necessary for unimpaired locomotor behaviour
 Authors: Joel Strautman, Surya Madabattula, Adam Magico, Francois Bolduc
 Affiliations: U of A

Introduction

Hereditary Spastic Paraplegia (HSP) is a rare and diverse group of heritable neurodegenerative disorders. These disorders are predominantly characterized by progressive weakness and spasticity of the legs, resulting in impaired locomotion. There is no known cure for HSP. Mutations in the gene spastin (SPG4) are the most common genetic cause of pure HSP (Reid, 2003). Several genes associated with HSP, including spastin, are evolutionarily conserved between humans and the fruit fly *Drosophila melanogaster*. In addition, locomotion defects are observed in *Drosophila* spastin null mutants that are similar to the motor impairments exhibited by human HSP patients (Sherwood et al., 2004).

Methods

We tested flies with loss of function genetic mutations-i.e., null and hypomorphic-in spastin to assess motor performance using a modified version of an established climbing assay (Palladino et al., 2002). For each 2 min. trial, the proportion of a sample of 20 flies that climb past a target height inside a 250 ml graduated cylinder is recorded. We also employed the Gal4-UAS system by using transgenic flies either overexpressing spastin or expressing RNAi against the gene, allowing us to further probe the role of spastin in *Drosophila* locomotion. Statistical analyses were performed using a one-way ANOVA and Tukey's post hoc multiple comparison test.

Results

Flies with both a deleted and disrupted spastin allele displayed a significant climbing defect. Furthermore, we demonstrate for the first time that flies pan-neuronally expressing spastin RNAi or overexpressing spastin, each with the Elav Gal4 driver, have detectable and substantial climbing defects.

Conclusions

Our results replicate previous evidence implicating the key role of spastin in *Drosophila* locomotion (Sherwood et al., 2004). Notably, we provide the first evidence that each of RNAi-based knockdown and genetic overexpression of spastin also cause a significant motor deficit. Future similar experiments will involve mutations in different HSP genes, such as atlastin. We will also employ immunofluorescence microscopy to visualize the localization of important HSP proteins.

Abstract #: 64
 Presenter: Fatheema Begum Subhan
 Supervisor: Rhonda Bell
 Title: Pre-pregnancy BMI and physical activity predict body composition in pregnancy
 Authors: Fatheema Begum Subhan, Ian Colman, Linda McCargar, Rhonda Bell
 Affiliations: U of A

Introduction

A high proportion of women exceed gestational weight gain (GWG) recommendations. Evidence from literature indicates that overweight and obese women are at an increased risk of excessive GWG; however more recently women in normal weight ranges are also showing an increased trend in gaining excessive GWG. Limited longitudinal data have examined body composition changes during pregnancy and factors influencing these changes are not explicit. The study objective was to describe the association between pre-pregnancy body mass index (BMI), physical activity and fat mass (FM) accretion during pregnancy.

Methods

This study is a part of the longitudinal cohort, the Alberta Pregnancy Outcomes and Nutrition (APrON) study. Pregnant women (n=600) were measured 2-3 times during pregnancy; data on weight, body composition (skin folds), diet (24 hour recall) and physical activity (Baecke questionnaire) were collected. Body density was calculated using sum of biceps, triceps, subscapula and suprailiac skinfold thicknesses using the Durnin and Womersley equation (1971). Fat mass was calculated from body density and body weight using a pregnancy specific equation (Van Raaij, 1988). Physical activity was assessed using Baecke questionnaire. Work, sports, leisure and total physical activity scores were determined. Data was analysed by linear mixed regression.

Results

Women with normal and overweight BMI gained similar amounts of total FM (3.5 ± 2.2 and 2.5 ± 3.0 respectively), while obese women gained less FM (1.5 ± 3.4) ($p < 0.01$). In longitudinal analyses, overweight and obese women had lower total physical activity and sports scores compared to women with normal BMI ($p < 0.05$). In a multilinear mixed-method analysis adjusted for time of study visit, maternal physical and demographic characteristics, energy and macronutrient intake and gestational age at term; sports score was inversely associated with FM accretion during pregnancy ($p < 0.01$).

Conclusions

There was a significant decline in physical activity especially sports activity among all women during pregnancy, which was associated with increased fat mass accretion. Remaining physically active during pregnancy could reduce the risk of higher fat mass accretion during pregnancy. Intervention studies promoting optimal gestational weight gain should address the importance of physical activity to optimize maternal health.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 65
 Presenter: Mona Alasmi
 Preceptor: Hien Q. Huynh
 Title: Incidence of eosinophilic esophagitis in pediatric in northern Alberta
 Authors: Amr Abdelradi, Aldrich Leung, Mordachai Slae, Rabin Persad, Hien Q. Huynh
 Affiliations: U of A

Introduction

Eosinophilic esophagitis (EoE) is recognized as a significant cause of dysphagia. The escalating incidence of EoE in pediatric as seen in the literature has been credited to be more than increased awareness of the disease. The incidence rates of EoE in children vary by geographic regions in developed countries and continue to rise from >0.91 per 10,000 in 2000 to 1.7 in 10,000 in 2004. To determine whether the incidence EoE in children age 0 to 14 years in northern Alberta has increase over the last 5 years (2008 to 2012).

Methods

Northern Alberta was defined to include the capital region and all the health regions north of as well as the northern half of David Thompson and East central. Annual population for children 0 to 14 years for each of the region from 2008 to 2012 was obtained from Statistics Canada and Alberta health services. The Stollery children's hospital is the only pediatric hospital that provides endoscopy service for children in this region. Cases of EoE were identified from our EoE clinic database from 2008 to 2012. All charts, endoscopy and biopsy were reviewed to confirm the diagnosis EoE according the recent consensus guideline. Their postal code and age and sex at the time of diagnosis were collected.

Results

Total patients identified with EoE were 86 from 2008 till 2012 (67 males). Patient's number according the age group 0-4 years, 5-9 years and 10-14 years are 20, 29, 37 respectively. The incidence of pediatric EoE was 3.47 in 2008, 6 in 2009, 5.65 in 2010, 4.55 in 2011 and 2.46 per 100000 in 2012. The incidence of EoE varied from 5.73 patients per 100,000 people per year in the capital, to 2.06 patients per 100,000 people per year in the other areas of northern Alberta.

Conclusions

In this study, we found annual incidence of pediatric EoE in the past five years has not changed and is staying at 4.2 to 4.4 per 100,000 children per year which is similar to the incidence in the literature.

Abstract #: 66
 Presenter: Lauren Albrecht
 Supervisor: Shannon Scott
 Title: Information needs and preferences of healthcare providers and healthcare consumers in general emergency departments in Canada: data from the Translating Emergency Knowledge for Kids (TREKK) needs assessment
 Authors: Shannon Scott, Lauren Albrecht, TREKK Team Research
 Affiliations: U of A

Introduction

In Canada, the majority of children requiring emergency care are treated in general emergency departments (EDs). Evidence shows that up to 40% of children treated in general EDs do not receive treatments for which clear evidence exists and up to 20% of these children receive a treatment that has been shown to provide no benefit or even causes harm. Simultaneously, there is a growing trend in healthcare towards increased consumer participation, leading to an unprecedented demand for consumer friendly, research-based health information and family-centred care. The Translating Emergency Knowledge for Kids (TREKK) project is a multi-year, multi-phase, pan-Canadian project aimed at ensuring that the latest research in pediatric emergency medicine is applied in general EDs across the country. In the first phase of TREKK (Needs Assessment), we partnered with 32 general EDs in nine provinces and one territory to determine the knowledge needs and preferences of health care providers working in these EDs, as well as parents seeking care for their children (healthcare consumers) in this setting.

Methods

To accomplish this, we developed and deployed two electronic surveys to collect asynchronous data in via a customized and interactive iPad 'app'.

Results

Data collection took place from May 2012 to July 2013 and resulted in 1,740 healthcare provider surveys and 1,069 healthcare consumer surveys. Data analysis using SPSS is currently underway. Healthcare provider variables to be presented are: demographics; length of time spent looking for job-related information; how/where healthcare professionals look for this information; information needed (i.e., clinical, patient ; family support, hospital environment, etc.); clinical information gaps (i.e., assessment, diagnosis, and treatment of specific clinical conditions, etc.) and; preferences for receiving job-related information. Healthcare consumer variables to be presented are: demographics; reason for child's ED visit; whether parents searched for information prior to coming to the ED; type of information parents searched (i.e., medical/health information; information about the ED; affective concerns; 'life' concerns, etc.); where/how they looked for this information and; who/where they would prefer to receive this information from.

Conclusions

The findings from this study will be of value to Canadians and will enable us to offer evidence-based information and interventions to ensure the best quality care for all Canadian children.

Funded by: WCHRI Partnership

Abstract #: 67
 Presenter: Misagh Alipour
 Supervisor: Eytan Wine
 Title: A balanced IL-1 β activity is required for host response to *Citrobacter rodentium* infection
 Authors: Misagh Alipour, Yuefei Lou, Daniel Zimmerman, Michael Bording-Jorgensen, Consolato Sergi, Julia Liu, Eytan Wine
 Affiliations: U of A

Introduction

Microbial sensing plays essential roles in the innate immune response to pathogens. In particular, NLRP3 forms a multiprotein inflammasome complex responsible for the maturation of interleukin (IL)-1 β . Our aim was to delineate the role of the NLRP3 inflammasome in macrophages, and the contribution of IL-1 β to the host defense against *Citrobacter rodentium* acute infection in mice.

Methods

Nlrp3^{-/-} and background C57BL/6 (WT) mice were infected by orogastric gavage, received IL-1 β (0.5 μ g/mouse; ip) on 0, 2, and 4 days post-infection (DPI), and assessed on 6 and 10 DPI.

Results

Infected Nlrp3^{-/-} mice developed severe colitis; IL-1 β treatments reduced colonization, abrogated dissemination of bacteria to mesenteric lymph nodes, and protected epithelial integrity of infected Nlrp3^{-/-} mice. In contrast, IL-1 β treatments of WT mice had an opposite effect with increased penetration of bacteria and barrier disruption. Microscopy showed reduced damage in Nlrp3^{-/-} mice, and increased severity of disease in WT mice with IL-1 β treatments, in particular on 10 DPI. Secretion of some pro-inflammatory plasma cytokines was dissipated in Nlrp3^{-/-} compared to WT mice. IL-1 β treatments elevated macrophage infiltration into infected crypts in Nlrp3^{-/-} mice, suggesting that IL-1 β may improve macrophage function, as exogenous administration of IL-1 β increased phagocytosis of *C. rodentium* by peritoneal Nlrp3^{-/-} macrophages in vitro. As well, the exogenous administration of IL-1 β to WT peritoneal macrophages damaged the epithelial barrier of *C. rodentium*-infected polarized CMT-93 cells. Treatment of Nlrp3^{-/-} mice with IL-1 β seems to confer protection against *C. rodentium* infection by reducing colonization, protecting epithelial integrity, and improving macrophage activity, while extraneous IL-1 β appeared to be detrimental to WT mice.

Conclusions

Together, these findings highlight the importance of balanced cytokine responses as IL-1 β improved bacterial clearance in Nlrp3^{-/-} mice but increased tissue damage when given to WT mice.

Funded by: WCHRI Innovation Grant

Abstract #: 68
 Presenter: Liliana Alvarez
 Supervisor: Albert Cook
 Title: The neurophysiology of augmentative manipulation: a method for technical implementation
 Authors: Liliana Alvarez, Sandra Wiebe, Kim Adams, Albert Cook
 Affiliations: U of A

Introduction

The most well-known form of infant learning is motor experience. The strong relationship between motor and cognitive development suggests that the limited motor experience of children with physical disabilities can impact their cognitive and perceptual development. The assessment of cognitive skills of infants with physical disabilities is also compromised due to limited verbal communication and motor gestures. Robots have been used to give children with disabilities an opportunity to independently manipulate objects around them and to reveal their cognitive skills when they use the robots. However, little is known about the neural correlates that subtend robotic augmentative manipulation and its impact on the underlying mechanisms of neuroplasticity.

Methods

Several technical considerations pose a challenge to such studies. This paper presents a methodology for the implementation of neurophysiological exploration of robot-augmented manipulation. An adult pilot study was conducted in order to test the instrumentation method. The same set up designed for the child participants was tested to ensure applicability. EEG data from 10 healthy adult participants performing a robot mediated cognitive was recorded.

Results

Preliminary results of the adult pilot study designed to test the instrumentation process are presented. Switch closure was identified as causing a particular waveform artifact in the EEG signal. The use of independent component analysis and edited segmentation was implemented as a solution. The robot mediated task and the designed instrumentation constitute a feasible and safe method for the study of infant cognition.

Conclusions

Currently, the technical implementation method is being used in a study with typically developing children and children with severe physical disabilities. Advantages and disadvantages of this method for technical implementation are discussed. Following steps to apply this method for the study of cognition in infants with severe physical disabilities are also presented.

Funded by: WCHRI Trainee Travel Grant





Abstract #: 69
 Presenter: Abeer Alzaben
 Supervisor: Diana Mager
 Title: Interrelationships between high fructose corn syrup intake (HFCS) and markers of liver dysfunction, insulin resistance and inflammation in children and adolescents with non-alcoholic fatty liver disease (NAFLD)
 Authors: Abeer ALzaben, Irene Kim, Ingrid Iñiguez, Vera Mazurak, Susan Gilmour, Jason Yap, Diana Mager
 Affiliations: U of A

Introduction

Children with non-alcoholic fatty liver disease (NAFLD) have diets characterized by high intakes of fructose, particularly from foods containing commercially added sweeteners such as high fructose corn syrup (HFCS). The study purpose was to examine the interrelationships between HFCS intake and laboratory markers of liver dysfunction, cardio-metabolic risk and lipid metabolism.

Methods

Children and adolescents with NAFLD (13.2 ± 2.9 yr; $n=14$) and healthy age-matched lean (13.8 ± 2.4 yr; $n=16$) children were recruited. Fasting blood work for the analysis of ALT, AST, total cholesterol, LDL-and-HDL-cholesterol, triglycerides (TG), glucose, insulin, non-esterified free fatty acids (NEFA), inflammatory markers (IL-6, IL-10, TNF- α , CRP), and Apolipoproteins (B-100, B-48). Insulin resistance (IR) was assessed using the homeostasis model of IR (HOMA-IR >3 ; abnormal) and HFCS intake by three-day intake records.

Results

Lean children were significant lower in weight (47.0 ± 12.5 vs 86.2 ± 25.6 kg) and BMI (18.5 ± 2.3 vs 31.8 ± 5.9 kg/m²) than children and adolescents with NAFLD ($p<0.01$). Children with NAFLD had significant higher intakes of HFCS than lean children (16.4 ± 16.4 vs 0.9 ± 1.7 g/d; $p<0.01$). HFCS was positively correlated with ALT ($p<0.01$; $R^2=0.26$), HOMA-IR ($p=0.04$; $R^2=0.13$), TNF- α ($p<0.01$; $R^2=0.43$), Apolipoprotein B-100 ($p=0.04$; $R^2=0.32$) and negatively correlated with IL-10 ($p<0.01$, $R^2=0.25$). An inverse relationship was found between HFCS and HDL (above and below 1 mmol/L) ($p<0.01$, $R^2=0.27$). No other significant interrelationships between HFCS and NEFA, IL-6, and Apo B-48 were found ($p>0.05$).

Conclusions

High intakes of HFCS are associated with increased markers of liver dysfunction, insulin resistance and inflammation in children/adolescents with NAFLD. Dietary interventions focused on HFCS reduction may be an important therapeutic strategies in children and adolescents with NAFLD.

Abstract #: 70
 Presenter: Jillian Avis
 Supervisor: Geoff Ball
 Title: Developing the readiness and motivation interview for families (RMI-Family) in managing pediatric obesity: a pilot study
 Authors: Jillian Avis, Arnaldo Perez, Allison Rasquinha, Katie Dartnell, Bailey Scheuerman, Joanna Zelichowska, Suja Srikameswaran, Geoff Ball, Josie Geller
 Affiliations: U of A

Introduction

Clinical practice guidelines recommend that clinicians should determine families' motivation prior to initiating treatment for pediatric obesity. Most clinicians use their clinical acumen to assess families' motivational constructs, largely due to a lack of validated tools. To address this gap, the objective of this cross-sectional study was to pilot-test the Readiness and Motivation Interview for Families (RMI-Family) in pediatric weight management.

Methods

Youth (10–17 years; body mass index [BMI kg/m²] ≥ 85 th percentile) and their parents were recruited from the Pediatric Centre for Weight and Health (Stollery Children's Hospital, Edmonton, AB). Structured interviews were administered separately to youth and parents by trained research assistants. The interviews explored several motivational constructs (e.g. importance, perceived control, self-efficacy) to change nutrition and physical activity habits. Demographic and anthropometric data were also collected.

Results

Interviews were completed with 11 youth and parent dyads ($n=22$ participants). Youth had a mean BMI z-score of 2.2 ± 0.4 and were 12.4 ± 1.3 years old; parents had a mean BMI of 34.5 ± 9.9 kg/m² and were 46.8 ± 3.8 years old. Overall, (i) parents placed greater importance on healthy nutrition and physical activity habits for youth than youth did themselves, (ii) parent-youth concordance regarding motivation to change was higher for physical activity than for nutrition, and (iii) girls tended to possess higher levels of motivation to change lifestyle habits vs boys.

Conclusions

These preliminary data revealed important insights to further validate and evaluate the RMI-Family. A larger study ($n=200$ families) is planned to complete psychometric analyses (e.g. criterion validity, test-retest reliability) and apply motivational data to predict clinically-relevant outcomes (e.g. program attrition, treatment engagement).

Abstract #: 71
 Presenter: Ross Ballantyne
 Supervisor: Andrew Mackie
 Title: Examining the relationship between quality of life and illness perception in adults with congenital heart disease to inform the care of children and adolescents with congenital heart disease
 Authors: R. Ballantyne, A. Mackie, C. Norris, I. Vonder Muhll, D. Taylor, J. Windram, P. Heggie, K. Rankin, G. Rempel
 Affiliations: U of A

Introduction

Significant healthcare needs and the necessity for lifelong specialist care can negatively affect the quality of life (QOL) of those with congenital heart disease (CHD). The relationship between illness perception (IP) and QOL may offer a potential approach for transition programs (TPs) to address QOL in children and adolescents transitioning from pediatric to adult care. This study's aim was to examine associations between IPs and QOL in adults with CHD, while controlling for complexity of CHD, to determine potential approaches for TPs to address IPs and subsequently QOL in transitioning individuals.

Methods

This cross-sectional comparative study used The Brief Illness Perception Questionnaire (Brief-IPQ) to measure IPs and the Satisfaction with Life Scale (SWLS) to appraise QOL. Patients were identified through random sampling of the Western Canadian Children's Heart Network or through convenience sampling in an adult congenital cardiology clinic. Descriptive statistics, correlations, and multiple linear regression were used to examine the relationship between IPs and QOL. Using linear regression, complexity of CHD was controlled through examining the effect of this variable on the independent predictability of all eight IPs.

Results

Four-hundred questionnaires were mailed out with sixty-two returned. Fifty-two questionnaires were completed in clinic for a total of 114 respondents. The following Brief-IPQ scales were significantly ($p < .01$) correlated with SWLS score: consequences ($r(111) = -.61$), emotional representation ($r(111) = -.60$), concern ($r(111) = -.53$), and identity ($r(110) = -.45$). The results of multiple regression with all eight IPs indicated the IPs explained 42.7% of variance in SWLS score (Adjusted $R^2 = .427$, $F(8, 93) = 10.41$, $p < 0.001$). Furthermore, complexity of CHD did not significantly affect the independent predictability of any IP; perceived consequences, personal control, timeline, identity and concern continued to be independently significantly predictive of QOL.

Conclusions

Specifically addressing IPs through interventions may improve the QOL of transitioning individuals and requires further research. The findings indicate that TPs should focus on perceived consequences, personal control, timeline, identity, and concern. Knowledge of CHD was not independently predictive or correlated to SWLS and suggests that TPs, now currently focusing on patient education, may not adequately influence QOL.

Funded by: WCHRI Summer Studentship

Abstract #: 72
 Presenter: Deryk Beal
 Supervisor:
 Title: A strategic plan for gene discovery in childhood stuttering
 Authors: Deryk Beal, Christopher Bartlett, Jason Bohland
 Affiliations: U of A

Introduction

Developmental stuttering is a communication disorder that starts in children aged 2-5 years old and is characterized by involuntary speech sound repetitions, prolongations and silent blockages of airflow that interrupt fluent speech. The cause and cure are unknown. Neuroimaging studies of children who stutter have identified abnormalities in the neural networks governing speech production that contribute to speech fluency impairment. However, susceptibility to stuttering is heritable and a comprehensive understanding necessitates complementary investigations at the neurological and genetic levels. This poster highlights a strategic research program that is the first step towards the identification of genetic variation associated with stuttering phenotypes and a future understanding of how these variations impact brain development.

Methods

We are currently investigating the family aggregation of developmental stuttering and its co-occurrence with other developmental and genetic disorders via collection of family health history, a speech assessment and saliva DNA. Based on family history, we are strategically classifying probands into three pedigree categories (i) rare single-gene, high penetrance de novo mutation cases, (ii) familial forms that segregate a single mutation across generations and (iii) the remaining idiopathic cases. The first two groups of interest are prioritized for next-generation DNA sequencing for identification of rare genetic variants.

Results

In 3 months we have collected saliva DNA samples from 63 stuttering probands. Data collection is ongoing and analysis of family aggregation of the disorder is in progress.

Conclusions

Via our strategic plan we are establishing a database of DNA from stuttering and control probands as a necessary requirement to pursue investigation of the common genetic variants that contribute to the broader population of idiopathic stuttering using emerging techniques for characterizing disorder etiology, including genome-wide association and imaging-genetics. We are also working to identify and understand the developmental impact of rare variants.

Funded by: WCHRI Innovation Grant





Abstract #: 73
 Presenter: Prashant Bobhate
 Supervisor: Ian Adatia
 Title: QRS duration reflects abnormal right ventricle to pulmonary artery coupling in children with pulmonary hypertension
 Authors: Prashant Bobhate, Chodchanok Vijarnsorn, Long Guo, Shreepal Jain, Jennifer Rutledge, Yashu Coe, Ian Adatia
 Affiliations: U of A

Introduction

Pulmonary vascular resistance (PVR) and right ventricular-pulmonary artery (RV-PA) coupling are the major determinants of functional class and prognosis in patients with pulmonary artery hypertension (PAH). RV-PA coupling is reflected by pulmonary capacitance index (PAC) measured at cardiac catheterization. QRS duration reflects RV size, however, it is unknown if it is related to RV-PA coupling. We sought to determine the relationship of QRS duration and RV-PA coupling.

Methods

Clinical records of all patients (age < 17 years) with PAH defined as mean PA pressure > 25 mm Hg and PVR > 3 Woods units.m2 undergoing cardiac catheterization over period from January 2009 to April 2013 were reviewed. Children with congenital cardiac shunts were excluded. All patients had an electrocardiogram (ECG) within 1 week of the cardiac catheterization. QRS duration was measured using the ECG view application (Philips). PVR and PAC were calculated using standard formula.

Results

32 patients (17 M), median age 4 years (range 0.25 to 17), median weight 13.9 kg range 3.3 to 77) underwent 46 cardiac catheterization procedures. Diagnostic groups included idiopathic PAH (58%), left heart disease (14%) and bronchopulmonary dysplasia (28%). The mean PA pressure was 43 ± 18 mm Hg; mean pulmonary vascular resistance indexed was 9.6 ± 6 Woods units.m2. PAC was 0.13 ± 0.08 ml/mmHg/m2, QRS duration was 85 ± 17 msec. QRS duration correlated with the PACI ($r = -0.45$)

Conclusions

We found a correlation between QRS duration increased PVR and decreased PAC, both reflect increased disease severity and progression in children with PAH. QRS duration may be a useful non invasive marker reflecting impaired RV-PA coupling in children with PAH.

Funded by: WCHRI Trainee Research Grant

Abstract #: 74
 Presenter: Daniel Chambers
 Supervisor: Francois Bolduc
 Title: De-regulation of AKT pathway proteins in a Drosophila melanogaster model of fragile x syndrome
 Authors: Daniel Chambers, Adam Magico, Cory Rosenfelt, Francois Bolduc
 Affiliations: U of A

Introduction

Intellectual disability (ID) represents a group of disorders in which the development of intelligence and memory is impaired. Fragile X (FX) syndrome is the most common genetic cause of ID. FX is caused by methylation of the Fragile X Mental Retardation-1 (FMR1) gene, which results in a lack of the Fragile X mental retardation protein (FMRP). FMRP inhibits protein translation, and thus in FX, the level of overall protein synthesis is elevated in the brain. It has been found that a major regulator of protein synthesis, the AKT pathway, is dysregulated in mammalian models of FX. This pathway is a positive regulator of translation. The fruit fly (*Drosophila melanogaster*) has a FMR1 orthologue (*dfmr1*), and flies mutant for this gene have memory and social interaction defects similar to those found in FX patients. Thus, we predict that the AKT pathway generally, and phosphorylated form of AKT (p-AKT) specifically, is also dysregulated in FX flies.

Methods

Utilizing classical conditioning we tested FX flies ability to learn to avoid a smell paired with a shock to assess their learning capabilities compared to WT flies. We decided to investigate if both the phosphorylated and unphosphorylated form of AKT by using western blot analysis on brains of 1-3 days old adult *Drosophila*. We compared wild-type (WT) and *dfmr1* mutant flies. We quantified band intensities using imageJ, and statistical comparisons between bands from wild-type and *dfmr1* mutants were performed using Student's t-test.

Results

We show that FX flies have diminished learning capabilities compared to WT flies. This is consistent with previous studies that demonstrated that FX flies have impaired learning and memory capabilities. We show that expression levels of p-AKT are dysregulated in FX flies than in WT controls.

Conclusions

Our findings show that, at least one component of the AKT pathway, p-AKT, is dysregulated in the heads of FX flies. Higher levels of p-AKT are predicted to lead to higher levels of protein synthesis, which is consistent with what is normally observed in Fragile X syndrome. These results expand what is seen in other models, for example in the FX mouse models and will help design future treatments that could be tested in *Drosophila*.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 75
 Presenter: Amanda Chan
 Supervisor: Edmond Lou
 Title: Can ultrasound determine the optimum pad pressure during brace casting for scoliosis?
 Authors: Amanda Chan, Eric Chalmers, Doug Hill, Andreas Donauer, Douglas Hedden, Marc Moreau, Jim Mahood, Edmond Lou
 Affiliations: U of A

Introduction

Scoliosis is a three-dimensional spinal deformity that occurs most in adolescent females. The Cobb angle, measured from a standing radiograph, is the gold standard used to assess severity. A brace is recommended when the Cobb angle is between 20 to 45°. Studies report that high initial in-brace correction is an important factor in successful brace outcome. To design braces, orthotists rely on their experience and judgment to apply pressure pads to obtain the best in-brace correction. Too much pressure may cause discomfort while too little will not control the curve. However, the traditional method cannot evaluate the brace correction in real-time, which may delay the proper brace usage. The objective of this study is to investigate if real-time ultrasound can determine the optimum applied pressure to provide a maximum in-brace correction.

Methods

A medical ultrasound and a wireless pressure measurement system were used in this study. A 14 year old boy with a double curve (16° right thoracic [RT]; 22° left thoracolumbar [LTL]) participated in this study. Prior to the orthotist applying the brace pads to simulate a brace, a baseline ultrasound was scanned. Axilla, apical and lumbar pressure pads were then applied, primarily to treat the LTL curve. A new ultrasound and pressure values were recorded (T1). The orthotist then adjusted the applied pressure and a third scan (T2) was taken. The proxy Cobb angles from the ultrasound images were measured and the orthotist used the best simulated in-brace correction configuration to cast the brace.

Results

The proxy Cobb angles measured from the baseline, T1 and T2 scans of the RT and LTL were (17°, 23°), (13°, 11°), and (24°, 13°), respectively. The pressures applied at the axilla, apical and lumbar pads in T1 and T2 were (80, 50 and 110) mmHg and (70, 90 and 100) mmHg respectively. The severity of the RT curve increased when the apical pressure was increased in T2. The orthotist then decided to use the T1 configuration to cast the brace.

Conclusions

The use of the ultrasound and pressure measurement system has the potential to determine the optimum pad pressure level during brace casting.

Funded by: WCHRI Graduate Studentship, the Edmonton Civic Charitable Funds, Alberta Innovates Health Solutions and the Glenrose Rehabilitation Hospital Foundation

Abstract #: 76
 Presenter: Tamya Chowdhry
 Supervisor: Joanna MacLean
 Title: Obesity, breathing and sleep in children and adolescents: defining the spectrum of sleep disordered breathing
 Authors: Tamya Chowdhry, Evelyn Constantine, Glenda Bendiak, Sherri Katz, Hans Pasterkamp, Joanna MacLean
 Affiliations: U of A

Introduction

The prevalence of childhood obesity is increasing worldwide, which highlights the need for understanding the associations of obesity and its comorbidities. Sleep disordered breathing (SDB) is an important comorbidity, however there is little research regarding the full spectrum of sleep and breathing changes in children with obesity. The aim of this study is to describe the clinical features and specific risk/protective factors associated with SDB in obese children and adolescents undergoing sleep study.

Methods

A retrospective chart review was conducted to identify all children who underwent diagnostic sleep studies from January 2011 to December 2012 between the ages of 8 to 16 with a BMI greater than the 95th percentile. Sleep laboratory records, sleep study results and medical records were reviewed.

Results

A total of 71 subjects were identified. The mean age at the time of sleep study was 13.5±2.5 years with an average BMI of 36.8±7.1 kg. Males comprised the majority (61.1%) of the group. Apnea hypopnea index (AHI) was not related to BMI ($r^2=0.063$, $p=0.60$). The mean AHI was 9.7±12.1 events/hour with a range of 0-64.7 events/h. AHI was normal (AHI1.0) in 12.9% of the group. Based on AHI classification, 38.9% had mild SDB (AHI=1.0-4.9), 16.7% had moderate SDB (AHI=5.0-9.9) and 31.9% had severe SDB (AHI≥10). Comorbidities found in this cohort included asthma (25.0%), rhinosinusitis (20.8%), and ADHD (13.9%). Family history was positive for OSA (33.3%), breathing problems (22.2%) and obesity (19.4%). Percentage of slow wave sleep was positively correlated to BMI ($n=71$, $r^2=0.24$; $p=0.05$). Systolic blood pressure was negatively correlated with mean O₂ saturation during REM sleep ($r^2=0.49$, $p=0.01$) and total sleep time ($r^2=0.42$; $p=0.02$).

Conclusions

The results from this study demonstrate that changes in BMI correlate with changes in sleep quality more than AHI. This reinforces the importance of examining sleep in addition to breathing concerns in children and adolescents with obesity. Sleep quality may have an independent effect on morbidity in this population.

Funded by: WCHRI Start-up Funding





Abstract #: 77
 Presenter: Nathan Chu
 Supervisor: Gregory D. Funk
 Title: The role of adenosine in the hypoxic ventilatory response
 Authors: Nathan Chu, Tucaauê Alvares, James D. Young, Carol E. Cass, Gregory D. Funk
 Affiliations: U of A

Introduction

The ventilatory response to hypoxia (low oxygen) is characterized by an initial increase followed by a secondary depression, during which ventilation remains above control in adults, but falls below baseline in newborn and premature animals. This depression can be life-threatening. Hence there is great clinical interest in identifying underlying mechanisms. Extracellular adenosine (ADO) levels increase during hypoxia, via transport from intracellular stores by equilibrative nucleoside transporters (including ENT1 and ENT2), or degradation of ATP by enzymes. ADO is inhibitory and has long-been hypothesized as a mediator of the respiratory depression, but data are equivocal. ATP is released during hypoxia where its excitatory actions attenuate the secondary depression. However, ATP could also contribute indirectly to inhibition when degraded into ADO. We tested the hypotheses: i) that ADO contributes to hypoxic respiratory depression and ii) that the ADO underlying this inhibition derives from degradation of extracellular ATP.

Methods

We measured, via whole-body plethysmography, the hypoxic ventilatory response of wild-type, and ENT1 and ENT2 knockout (KO) mice. Breathing was recorded for 10 minutes each in control (room air), hypoxia (8% O₂), and recovery (room air). The magnitude of depression was calculated by comparing ventilatory parameters at the peak of the initial increase with the steady-state level during the secondary depression.

Results

ENT2 KO mice were similar to wild-type controls. However, in ENT1 KOs the secondary depression of minute ventilation (and breathing frequency) was significantly greater than wild types (44.0±4.8%, n=6 vs. 30.3±2.7%, n=8) and ENT2 KOs (44.0±4.8% vs. 26.6±6.1%, n=7).

Conclusions

These data suggest that ADO is a major contributor to the secondary hypoxic respiratory depression and that its removal by ENT1 normally attenuates the depression. Finally, data suggest that the extracellular ADO underlying the inhibition derives from the degradation of ATP.

Funded by: WCHRI Summer Studentship, CIHR, WCHRI, AIHS

Abstract #: 78
 Presenter: Kristie DeHaan
 Supervisor: Joanna MacLean
 Title: Cardio respiratory function in pre-adolescent children born extremely preterm
 Authors: Kristie DeHaan, D Fuhr, L Hendson, B Kamstra, M Stickland, B Thebaud, Joanna MacLean
 Affiliations: U of A

Introduction

Infants born extremely preterm (<28 weeks GA) are at an increased risk of health complications. Problems associated with respiratory and cardiovascular function persist throughout childhood. Bronchopulmonary Displasia (BPD), a lung disease associated with mechanical ventilation and oxygen use in preterm infants, is associated with poor lung development. The aim of this study is to compare respiratory and exercise function in children born extremely preterm with and without BPD to otherwise healthy children born at term (>36 weeks GA).

Methods

Case children were recruited from a cohort born extremely preterm who were cared for at the Royal Alexandra Hospital. This group was subdivided into two groups: children born preterm who developed BPD (BPD group) and children born preterm who did not develop BPD (preterm group). Children born at term with no significant respiratory illness also participated (control group). All children performed standard Pulmonary Function Testing and a graded Cardiopulmonary Exercise Test. Parents completed questionnaires on health and well being prior to the activity day.

Results

Testing has been completed in 48 children with BPD, 50 preterm and 54 control children. The mean age of children at testing was 11.5±1.7 years. Group differences were seen for forced expired volume in 1 second (FEV₁; BPD 83±15%; preterm 88±14%; control 92±13%, p0.05), forced vital capacity (FVC; BPD 97±19%; preterm 103±15%; control 103±10%; p0.05) and FEV₁/FVC ratio (BPD 92±12%, preterm 91±7%; control 97±9%; p0.05). Lungvolume measures did not differ by group with the exception o residual volume/total lung capacity (RV/TLC; BPD 121±33%; preterm 112±4%; control 107±4%, p

Conclusions

Pre-adolescent children born extremely preterm have lower lung function compared to control children. BPD additionally lowers lung function. Despite these differences, children born extremely preterm have lung function within a normal range. As a group, children with BPD show significant impairment in exercise capacity.

Funded by: WCHRI Start-up Funding

Abstract #: 79
 Presenter: Tamara Germani
 Supervisor: Lonnie Zwaigenbaum
 Title: A scoping review of participation-based assessments for children with autism spectrum disorder
 Authors: Tamara Germani, Lori Sacrey, Joyce Magill-Evans, Lonnie Zwaigenbaum
 Affiliations: U of A

Introduction

Participation is the involvement in a life situation (WHO, 2007). The majority of participation-based assessments for children with disabilities have been primarily created, developed and standardized for children with physical disabilities or is diagnosis specific, such as acquired brain injury. A scoping review was performed to determine what assessments are available to assess participation in children with Autism Spectrum Disorder.

Methods

Search started with electronic databases of CINAHL, ERIC and PUBMED for years 1990 and onwards. Assessments were compiled into chart format for comparison of psychometric properties, administration time, child age, diagnostic groups, and constructs assessment. Other sources reviewed included OTSeeker, CanChild, rehabilitation/ health measurement textbooks and clinician recommendations.

Results

A total of 24 assessments were identified and 17 met inclusion criteria. Most assessments focused on children between ages 7-12 years old, based on parent or caregiver reports and included additional constructs such as activities or environment.

Conclusions

This review provides information about available assessments for measurement of participation in ASD, as well as existing gaps in the field.

Abstract #: 80
 Presenter: Marilyn Gordon
 Supervisor: Shairaz Baksh
 Title: The tumor suppressor RASSF1A links inflammation and cancer via a novel regulation of tyrosine phosphorylation of YAP
 Authors: Marilyn Gordon, Yahya Fiteih, Marius Sudol, Shairaz Baksh
 Affiliations: U of A

Introduction

The link between chronic inflammatory diseases and cancer later in life is known, however, the molecular mechanisms are largely unexplored. Ras association domain family 1A (RASSF1A or 1A) has roles in multiple signaling pathways including modulating apoptosis, the cell cycle, DNA damage, and microtubule organization. It is established by our group and others that the loss of 1A results in cell cycle dysregulation and tumor formation. 1A is also thought to regulate the transcriptional activity of Yes-associated protein (YAP) by activation of MST1 upon cell death, resulting in activation of LATS1 and phosphorylation of YAP on serine 127. pS127-YAP is sequestered in the cytoplasm by association with 14-3-3, restricting the ability of YAP to promote proliferation.

Methods

A mouse model of colitis-like inflammation induced by addition of dextran sodium sulfate in the drinking water was utilized. Colonic tissues/cells were collected for protein analysis and histology.

Results

We reveal a novel role for RASSF1A in restricting inflammation through the nuclear factor kappa B pathway. Genetic loss of 1A resulted in exacerbated colitis symptoms, increased rectal bleeding, colonic shortening, and decreased survival in a dextran sodium sulfate induced colitis model. Loss of 1A also resulted in a novel tyrosine phosphorylation of YAP on tyrosine 357 (pY357-YAP) to drive an aberrant transcriptional up-regulation of pro-apoptotic genes. This resulted in increased epithelial cell death, inefficient epithelial repair, and poor survival of *Rassf1a*^{-/-} mice following inflammation induced injury.

Conclusions

We propose a possible use of pY357-YAP as a biomarker of colitis to indicate disease appearance/severity. The use of tyrosine kinase inhibitors to restrict pY357-YAP and the abnormal up-regulation of pro-apoptotic genes in the absence of 1A may be beneficial in treating inflammatory diseases. Furthermore, our observations may help explain the link between intestinal inflammation and colon cancer in the absence of the 1A tumor suppressor. .

Funded by: WCHRI Trainee Travel Grant, Stollery Children's Hospital Foundation/Hair MassaCure Donation Fund, CBCF, AIHS





Abstract #: 81
 Presenter: Lyndsey Hahn
 Supervisor: David McConnell
 Title: Wellbeing outcomes of children being raised by a parent with a disability
 Authors: Lyndsey Hahn, David McConnell
 Affiliations: U of A

Introduction

There is little published on the wellbeing outcomes of children being raised by a parent with a disability. The available data suggests that outcomes are diverse. The aim of this study is to determine if there is a relationship between parental disability and child wellbeing outcomes and to investigate the social conditions in which these families live.

Methods

Secondary data analysis of Cycle 1 of the National Longitudinal Survey of Children of Youth (NLSCY). The NLSCY includes parent report data and self-report youth data. This data includes a sample of 22,831 children between the ages of 0 to 11 years old.

Results

Children were more likely to be living in lower-income households and unsafe neighborhoods if they were being raised by a parent with an activity restriction. Parents with an activity restriction were less likely to report that their child's health was excellent. No differences between children with and without a parent with an activity restriction were found in relation to indicators of educational wellbeing or family and peer relationships.

Conclusions

Continued research involving the social conditions and wellbeing of children being raised by a parent with a disability is needed in order to develop research informed policies and programs that meet the needs of these families.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 82
 Presenter: Janine Halayko
 Supervisor: Joyce Magill-Evans
 Title: "Use your brakes and slow down": Teaching two-wheeled cycling to children with a cognitive delay
 Authors: Janine Halayko, Joyce Magill-Evans, Helene Polatajko, Veronica Smith
 Affiliations: U of A

Introduction

Individuals with disabilities frequently have difficulty learning to ride a two-wheeled bicycle, limiting their participation in an important leisure activity. The Edmonton Bicycle Commuters Society (EBC) has been supporting a "You Can Ride Two" (YCR2) class since 2003 and is seeking to improve their use of research to guide this curriculum. The Cognitive Orientation to Occupational Performance (CO-OP) approach has been used by YCR2 and other programs to teach cycling to children with a developmental coordination disorder. A key component of the CO-OP approach is the child's involvement in determining the progression of teaching. It is not yet clear if CO-OP can be used to teach children with cognitive delays.

Methods

Principles of community-based research were used to guide a multiple baseline single subject design. A modified CO-OP approach was implemented and all sessions were videotaped. Primary outcome measures were distance and time cycled, and secondary measures included cycling skills mastered and performance and satisfaction (by parent report) using the Canadian Occupational Performance Measure. Seven individuals (Intelligence Quotient: 41-54) aged 10-19 who were unable to ride a two wheeler more than 2 metres were recruited. Six participants (86%) had a diagnosis of Down syndrome. Intervention consisted of up to 8 sessions (M=7.4) held over a period of up to 7 weeks (M=4.9).

Results

Following intervention six of the children (86%) rode more than 100 meters (range 103m-1756m) and demonstrated improvements in all subjective measures of motor skill acquisition. Five children (71%) were able to participate in group or family bike rides.

Conclusions

The positive results across measures and participants suggest a modified CO-OP approach may be effective for teaching two wheeled cycling to children with mild to moderate cognitive delays. A key to the effectiveness of the intervention lies in its participatory nature; children's feedback throughout the process was instrumental in finding the most effective strategies for several skills including bicycle launch. The YCR2 curriculum is being modified as a result of this research and the findings are being shared on their website. The results are helpful for determining best practice for teaching cycling to children with intellectual disabilities and to build the evidence base for CO-OP and the types of children for whom it is useful.

Funded by: WCHRI Summer Studentship

Abstract #: 83
 Presenter: Lisa Hartling
 Supervisor:
 Title: Scoping reviews: a valuable first step in knowledge synthesis
 Authors: Lisa Hartling, Michele Hamm, Andrea Milne
 Affiliations: U of A

Introduction

Scoping reviews identify, collect and summarize knowledge in broad topics. We conducted a scoping review on the use of social media in healthcare to identify the extent and nature of available evidence. The objective of this presentation is to discuss the information we gained from the review and its value in delineating the focus and methods for more in-depth systematic reviews.

Methods

We conducted a comprehensive search and identified 371 studies. We mapped these according to user groups, types of evidence, clinical areas, purpose of social media, and outcomes examined.

Results

This process was valuable for: 1) defining the search strategy; 2) defining the intervention and its scope; 3) identifying areas where in-depth synthesis is appropriate; and 4) providing a foundation to specify the focus and methods of subsequent systematic reviews. Given the newness of this area, MeSH headings for searching were limited. We iteratively identified studies and examined their indexing to build a list of key words. We identified sources of grey literature and specific journals to hand-search. We found that research in this area is emerging at a rapid pace; therefore, timing of the search and updates is critical. Social media encompasses a number of different online applications, is not consistently defined, and is constantly evolving. This work allowed us to more clearly define terms and identify challenges that may be encountered in conducting a SR. Mapping identified the types of evidence available and areas where there is sufficient evidence to warrant further in-depth systematic reviews. The scoping work provided a solid basis for successful grant applications to conduct systematic reviews in specific clinical areas.

Conclusions

A scoping review allowed us to map the evidence for a broad topic. This exercise has been valuable in terms of delineating the search, defining terms, and identifying topic areas where further SRs are appropriate and worthwhile.

Abstract #: 84
 Presenter: Priya Jaggi
 Supervisor: Alvaro Osornio-Vargas
 Title: Content validation of a questionnaire specifically designed to identify pediatric environmental risk factors
 Authors: Priya Jaggi, Alvaro Osornio-Vargas, Irena Buka, Jesus Serrano
 Affiliations: U of A

Introduction

Evidence is growing that the environment plays a large role in various pediatric conditions. Questionnaires are the predominant tools that assist clinicians to assess environmental health. Without being tested for their validity and reliability before application, they can lead to clinical error and biased interpretations. Despite the abundance of questionnaires used in clinical settings, very few have had a formal validation. Also, a lack of training in environmental health prevents physicians from exploring environmental risk factors other than routine ones, i.e. tobacco smoke and lead. The Pediatric Environmental Health History (PEHH) questionnaire developed by us for clinical use is no exception and underwent content validation.

Methods

Environmental health experts were identified mainly through Pediatric Environmental Health Specialty Units. Their opinion on question relevancy was required for 200 questions spanning 9 sections (version 1), through an online survey. A second version (248 questions) was then generated based on their suggestions and reiterated in anticipation of content improvement. Percent Agreement (PA) (average percent of experts rating an individual question as relevant per section) and Universal Agreement (UA) (percent of questions per section that has been agreed upon by all of the experts) were determined as measures of content improvement. A third version (262 items) was then created in part by their reiterated feedback and applied to Parents/Guardians (P/G) to assess its usability based on ten questions, rated on a scale of 1 to 4 (strongly disagree strongly agree).

Results

For the first round involving ten experts, the PA and UA ranged 79%-94%, and 14%-64%, respectively, indicating good reviewer consensus, but low UA due to highly subjective responses. The reiteration included only eight of the original experts, in which the PA and UA changed to 91%-98% and 47%-85%, respectively. All of the sections had a PA above 90%, rendering them as having excellent content validity. Average ratings for each usability question for 43 P/G was between 3 and 4, indicating high satisfaction with question understandability, ease of answering, ability of the PEHH to explore the environment, PEHH length, and their overall experience.

Conclusions

After two survey iterations, the PEHH reached more expert response homogeneity and therefore content improvement. P/G indicated satisfaction with the PEHH usability. We are awaiting comments from Pediatricians about the PEHH usefulness.

Funded by: WCHRI, Hair Massacure (Division of Oncology/Haematology and Palliative Care), Emerging Research Team Grant (ERTG)





Abstract #: 85
 Presenter: Jawad Alzamil
 Supervisor: Todd Alexander
 Title: Identification of Claudin-14 promoter and calcium sensing receptor (CaSR) signaling sensitive elements
 Authors: Jawad Alzamil, Wanling Pan, Todd Alexander
 Affiliations: U of A

Introduction

A kidney stone can develop when certain chemicals in our urine form crystals that stick together. Most stones form in the kidneys. Most stones (70 to 80 percent) are made of calcium oxalate. A smaller number are made of uric acid or cysteine. One out of ten Canadians will have a kidney stone at some point in their life. The greatest risk factor for kidney stones is hypercalciuria (i.e. urine with excess calcium), for which the etiology is unknown. A recent GWAS study linked hypercalciuria to Claudin-14. Moreover, data support the existence of a mechanism whereby activation of the CaSR in the TAL increases Cldn14 expression, which in turn blocks the paracellular reabsorption of Ca(2+). This molecular mechanism likely facilitates renal Ca(2+) losses in response to elevated serum Ca(2+).

Aims: 1-To Identify Claudin 14 promoter. 2-To Identify (CaSR) signaling sensitive elements.

Methods

1. Regular PCR on sequence of mcln14 V1, V2 and V3 to show the coding region and 5'UTR. 2- Identify the claudin-14 transcript that is regulated by CaSR by doing RT PCR on different 5' untranslated regions of the 3 variants using Kidney cDNA(RNA & oligo-dT) from mice treated with Cinacalcet. To demonstrate that transcript X is regulated by the calcium sensing receptor: by cloning 500-1500bp 5' of the 5' UTR and express it in a PGL3 basic vector to demonstrate if we have a promoter. 4- Examine luciferase expression of the above in the presence and absence of increased calcium concentration in the medium (i.e. more light with more calcium)

Results

RT-PCR results showed a significant increase of mRNA expression of V1 in the Cinacalcet treated group compare to control group but only a slight increase of mRNA expression of V2 and V3. Cloning of mcln14 V1 and V2 and then examining it using luciferase expression of the above in the presence of CaCl₂ in the medium didn't show increase expression when we compare it to a negative control PGL3-basic.

Conclusions

mcln14 V1 is regulated by activation of CaSR. This need to be further investigated by cloning multiple fragments 100 and 1500bp 5' of the 5' UTR of mcln14 V1 and then examine the luciferase expression to identify the promoter which may help us to identify (CaSR) signaling sensitive elements.

Abstract #: 86
 Presenter: Katrina Kully-Martens
 Supervisor: Carmen Rasmussen
 Title: Mathematics intervention for children with prenatal alcohol exposure and fetal alcohol spectrum disorder
 Authors: Katrina Kully-Martens, Jacqueline Pei, Julie Kable, Clare Coles, Gail Andrew, Carmen Rasmussen
 Affiliations: U of A

Introduction

Individuals with fetal alcohol spectrum disorders (FASD) experience deficits in behavior, cognition, and academic functioning resulting from congenital alcohol-induced brain damage. Although receiving intervention for developmental disabilities is a strong protective factor against negative outcomes in FASD, research on interventions in this population is in its infancy. Recently, a mathematics intervention for children with FASD was developed and piloted in the United States. The intervention—called the Math Interactive Learning Experience (MILE) program—aims to habilitate underlying disabilities common in FASD (e.g., impairments in executive functioning, working memory, and visuospatial processing) that contribute to difficulties in mathematics. MILE has been shown to have long-term effectiveness in improving mathematical ability in American children with FASD. The purpose of the present study was to replicate and extend this intervention in a school setting in Edmonton.

Methods

Seventeen children aged 4-10 with confirmed prenatal alcohol exposure or a diagnosis of an FASD were assigned to either the math intervention or a contrast intervention. Following pre-testing, children in both intervention groups received 10 half-hour individualized and one-on-one tutoring sessions once or twice per week over the course of 6 to 8 weeks. Several changes were made to the math intervention, most notably excluding a significant parental component and conducting the intervention in an ecological setting instead of a laboratory.

Results

At pre-test, both groups were found to generally exhibit below-average math, executive function, working memory, and visual-spatial skills. Following a relatively brief, individualized, one-on-one intervention, children in the math group exhibited significantly greater changes in math achievement than the contrast group. Specifically, the math group improved their performance by 14.27 raw score points, compared to 1.5 points in the contrast group. Significant changes in other cognitive functions were not observed. Older age, lower IQ, and lower SES were associated with increased treatment change in the math group.

Conclusions

The replication of MILE in a school setting with minimal parental involvement appears to have a significant, positive impact on mathematics achievement scores of children with prenatal alcohol exposure. The findings of this project will innovatively impact intervention research, service delivery, and basic understanding of children with FASD and how to best meet their complex (and often unmet) health, psychological, and educational needs.

Funded by: WCHRI Graduate Studentship|Trainee Travel Grant

Abstract #: 87
 Presenter: Rotem Lavy
 Supervisor: Fred Berry
 Title: FOXC1 regulation of MESP2 expression during somitogenesis
 Authors: Rotem Lavy, Katherine Eaton, William Allison, Fred Berry
 Affiliations: U of A

Introduction

The vertebral column develops from segmented structures called somites. Disruption of somite formation can lead to deformities of the axial skeleton. The transcription factor MESP2 has a central role in regulating somite formation, and mutations in MESP2 lead to misshapen or fused vertebrae in humans. The transcription factor FOXC1 is a key regulator of somitogenesis. Loss of *foxc1* function in zebrafish and loss of *Foxc1*; its paralogue *Foxc2* in mice leads to defects in somite formation and loss of *Mesp2* expression. Our aim is to determine whether expression of *Mesp2* is directly regulated by *Foxc1*.

Methods

We evaluated the expression of *mespba*, the zebrafish MESP2 orthologue, in *foxc1* morphants using whole mount in situ hybridization. We then quantified *mespba* expression in the developing tailbud by quantitative PCR. We also assessed whether *foxc1* could activate a *mespba* promoter construct consisting of a 2.4kb fragment upstream of the *mespba* transcription initiation site cloned onto a luciferase reporter.

Results

In control embryos we observed *mespba* expression in the newly formed somite and in the tissue of the next to be formed somite. This expression pattern was observed at various time points during somitogenesis (starting at the 3-somite stage, and every 2 hours up to completion of somitogenesis). However, in the *foxc1* morphants *mespba* expression was either absent or reduced. Additionally, the anterior most somites were not formed in the *foxc1* morphants, with a recovery in posterior somite formation later in development. RT-qPCR also showed a decrease of *mespba* expression in *foxc1* morphants compared to control animals at 22 and 24 hours post fertilization. In the luciferase reporter gene assay we observed an increased activation of the *mespba* promoter when co-transfected with *foxc1*.

Conclusions

We demonstrate that *mespba* is a target for *foxc1* transcriptional regulation. Our results indicate that FOXC1 functions in a common regulatory network as MESP2 to control somite patterning and development.

Abstract #: 88
 Presenter: Joshua Lee
 Supervisor: Toshifumi Yokota
 Title: Dystrophin exons 45-55 skipping with antisense oligonucleotide cocktail.
 Authors: Joshua Lee, Yusuke Echigoya, Joshua Kim, Toshifumi Yokota
 Affiliations: U of A

Introduction

Duchenne muscular dystrophy (DMD) is the most prevalent lethal genetic disorder in children, arising from mutations in the dystrophin (DMD) gene. There is currently no cure for DMD. Recently, exon skipping has been investigated as a potential therapy for DMD. Exon skipping uses short, synthetic DNA-like molecules called antisense oligonucleotides (AOs) to interfere with exon inclusion signals during the process of pre-mRNA splicing. As a result, the mutation-carrying portion of the gene is not incorporated into the final mRNA product, restoring the open reading frame and facilitating production of functional protein. Although promising, exon skipping faces two challenges: 1) limited applicability, and 2) unknown protein stability/function. Multiple exon skipping of exons 45-55 in the DMD gene would address both issues. The purpose of the present study is to test the feasibility of restoring dystrophin protein expression via multiple exon skipping of exons 45-55 in vitro.

Methods

Primary fibroblasts were obtained from DMD patients, transduced with a GFP-expressing retroviral vector containing the muscle differentiation gene *MyoD*, and differentiated to myotubes. Immortalized DMD muscle cell lines were obtained from our collaborators. We employed a cocktail of AOs called phosphorodiamidate morpholino oligomers targeting exons 45-55 in the DMD gene. RT-PCR products from AO-treated DMD myotubes were electrophoresed and bands of interest were excised and sequenced. Immunocytochemistry was performed on *MyoD*-transduced human myotubes and immortalized myoblasts to confirm expression of muscle-specific proteins and to analyze dystrophin expression.

Results

Electrophoresis of RT-PCR products from AO-treated DMD cells showed distinct bands corresponding with the expected length of exon-skipped products. Sequencing analysis confirmed the presence of exons 45-55 skipped products. We confirmed the restoration of dystrophin protein in AO-treated DMD cells and expression of muscle-specific proteins *MyoD*, desmin, and myosin heavy chain by immunostaining.

Conclusions

Based on the observation of exons 45-55 skipped products and dystrophin staining in AO-treated cells, we conclude that multiple exon skipping of exons 45-55 in the DMD gene and restoration of dystrophin protein is feasible in vitro. This is the first demonstration of successful exons 45-55 skipping in the human DMD gene.

Funded by: WCHRI Graduate Studentship





Abstract #: 89
 Presenter: Anra Lee
 Supervisor: Karin Olson
 Title: Screening and assessing adolescents with cancer for a major depressive episode
 Authors: Anra Lee, Kathleen Hegadoren, Fiona Schulte, Gwen Rempel, Karin Olson
 Affiliations: U of A

Introduction

Cancer is the leading cause of death from disease among adolescents. Over 2,000 Canadian adolescents are diagnosed annually. The typical challenges of adolescence can be complicated by a cancer diagnosis and its treatment, disrupting developmental processes and increasing risk of depression. Nevertheless, depression in adolescents with cancer remains understudied. Existing literature suggests that the validity and clinical utility of screening tools for assessing depression in pediatric oncology has not been established. The purpose of this study is to establish the psychometric properties of a depression screening tool that is often used in pediatric oncology, and to explore possible predictors of a major depressive episode in this population.

Methods

A cross-sectional design will be used with adolescents who: (a) were diagnosed with cancer between January 2011 and December 2013; (b) are 13 to 17 years old at the time of recruitment; (c) have received treatment at the Alberta Children's Hospital or the Stollery Children's Hospital; and (d) have no previous history of a major depressive episode or other psychiatric or developmental disorders. Data collection will occur between October 2013 and April 2014. Participants will complete two standardized screening tools: the Children's Depression Inventory (CDI) and the Multidimensional Anxiety Scale for Children (MASC), and undergo a structured diagnostic interview, the Diagnostic Interview for Children and Adolescents (DICA). Results of the CDI will be compared to the DICA, using sensitivity and specificity analysis. Multiple regression will also be employed to measure the extent to which age, sex, and anxiety predict a DICA score that is diagnostic of depression.

Results

This proposed study is currently undergoing ethical review. Once ethics approval has been obtained, recruitment and data collection will begin.

Conclusions

This proposed study will address a significant gap in our knowledge about mood symptoms and their assessment in adolescents diagnosed with cancer. A validated diagnostic tool would provide an important preliminary step in accurately assessing this population for depression and thus aid in the provision of early proactive interventions. These findings may also give rise to future studies on routine comprehensive psychosocial assessments.

Funded by: WCHRI Graduate Studentship

Abstract #: 90
 Presenter: Chloe Luck
 Supervisor: Rachel Wevrick
 Title: Feeding pathways in a mouse model of Prader-Willi Syndrome
 Authors: Chloe Luck, Rachel Wevrick
 Affiliations: U of A

Introduction

Prader-Willi Syndrome (PWS) is a genetic disorder caused by the deletion of several genes on chromosome 15. Children with PWS suffer from an initial failure to thrive followed by constant hunger, reduced activity and intellectual delay. The abnormal motivation to eat suggests the involvement of the dopamine reward system. Abnormal activation of this pathway has been shown in binge eating disorders including PWS leading to the inappropriate feeding behaviour. This suggests a role for one or more of the inactivated genes on dopamine production or transmission within the mesolimbic dopamine pathway. Magel2 is one of the genes inactivated in PWS.

Methods

Immunohistochemistry (IHC) will be used to compare the number of dopaminergic neurons in various mesolimbic nuclei including the substantia nigra, the ventral tegmental area, and the arcuate and paraventricular nuclei in the hypothalamus. IHC will also be used to measure any differences in leptin receptor activation in Magel2-null animals compared to wildtype littermates. The biochemical responses initiated by chronic exposure as well as withdrawal from drugs of abuse as well as palatable food will be compared between genotypes.

Results

Mice lacking Magel2 have a PWS-like phenotype including increased fat mass and a decreased voluntary activity. These mice also have a reduced concentration of dopamine in whole brain lysates and a reduced locomotor response to cocaine, which suggests Magel2's involvement in the dopamine-reward system.

Conclusions

These results will pinpoint where in the neural reward pathway Magel2 acts and how the deletion of this gene contributes to the eating disorder in PWS. This will provide a better understanding of the molecular mechanisms involved in the abnormal feeding and locomotive observed in PWS and other forms of obesity.

Funded by: WCHRI Graduate Studentship, U of A Department of Medical Genetics

Abstract #: 91
 Presenter: Joanna MacLean
 Supervisor:
 Title: Ventilatory response in pre-adolescents born extremely preterm
 Authors: Joanna MacLean, Kristie DeHaan, Des Fuhr, Michael Stickland, James Duffin
 Affiliations: U of A, Stollery

Introduction

Experimental studies in animals show that newborn animals exposed to abnormal exposures, including oxygen and drugs that alter ventilatory response, have altered response to subsequent respiratory challenge even after return to breathing room air. This altered response persists into adulthood. Infants born extremely preterm have exposure to both abnormal levels of oxygen as well as medications that alter ventilatory response. The aim of this study was to assess ventilatory response in preadolescents born extremely preterm.

Methods

Children with a history of extreme preterm birth and healthy children born at term were recruited at 8-12 years of age. Ventilatory response was measured using a modified rebreathe technique (Duffin method). After a baseline period, children were coached to hyperventilate for 5 minutes to bring end tidal CO₂ (ETCO₂) 10mmHg below baseline. At the end of 5 minutes, a 2 way valve was switched so the children were rebreathing from a reservoir containing 5% O₂ and 6% CO₂. Oxygen was titrated in to maintain end tidal O₂ (ETO₂) at 50 mmHg. Measures of ventilatory response included ventilatory response threshold (ETCO₂ at which ventilation increased) and the initial slope of the ventilation response to CO₂ (S1 slope).

Results

Ventilatory response testing was successful in 39 children; 13 control children, 17 children born preterm, and 9 children born preterm with a history of bronchopulmonary disease (BPD) at a mean age of . Children with a history of BPD were born earlier (27.0±0.9 vs 25.9±1.6 GA, p<0.001) and had lower birthweight (1059±143 vs 837±170 g, p<0.001) than preterm infants. Baseline ventilation and VRT did not differ between groups. S1 slope was higher in children with a history of BPD (3.89±1.29 L/min/mmHg) compared to both control (3.51±1.87 L/min/mmHg) and children with a history of preterm birth (2.44±1.05 L/min/mmHg, p<0.05).

Conclusions

Ventilatory response is altered at 8-12 years of age in children with a history of BPD. This may be the result of early exposures and could impact subsequent response to respiratory challenge including respiratory infections.

Funded by: WCHRI Innovation Grant, Start-up Funding

Abstract #: 92
 Presenter: Qaasim Mian
 Supervisor: Po-Yin Cheung
 Title: Excessive tidal volumes administered through positive pressure ventilation in preterm infants may cause brain damage
 Authors: Qaasim Mian, Georg Schmölder, Khalid Aziz, Megan O'Reilly, Gerhard Pichler, Po-Yin Cheung
 Affiliations: U of A

Introduction

International resuscitation guidelines recommend positive pressure ventilation (PPV) if infants fail to initiate spontaneous breathing. The purpose of PPV is to deliver an adequate tidal volume (V_T), establish functional residual capacity, achieve gas exchange, and initiate spontaneous breathing, while minimizing lung injury. High V_T delivery during PPV in the delivery room (DR) is common and has been associated with brain injury in animal models. The aim of the study was to examine if high V_T delivery during PPV cause brain injury in preterm infants.

Methods

Infants <36 weeks gestational age receiving PPV through facemasks were included. At the Royal Alexandra Hospital physiological parameters including V_T are routinely monitored during the initial stabilization in the DR. A breath-to-breath analysis for V_T was performed during mask PPV. The median values of V_T delivery were compared with recently described reference ranges for V_T in spontaneously breathing preterm infants at birth (Schmölder et al, 2013). Infants were divided into two groups according to V_T delivery < or > 5.8 mL/kg (low and high V_T, respectively). Significant brain injury with major intraventricular hemorrhage (IVH) or periventricular leukomalacia was assessed based on routine ultrasound imaging.

Results

From March through June 2013, 32 preterm infants were included with a mean gestational age of 29±(SD)2 weeks and a mean birth weight of 1355±117g. Of 25 infants with high V_T, 10 (40%) developed significant brain injury, with 5/10 having parenchymal extension in IVH. Of seven infants with low V_T, none had significant brain injury (P=0.045 vs. 40% in 25 infants with high V_T, z-test).

Conclusions

High V_T delivery in preterm infants during mask PPV at birth potentially causes brain injury.

Funded by: WCHRI Summer Studentship





Abstract #: 93
 Presenter: Devlin Morrison
 Supervisor: Edmond Lou
 Title: Correlation between Cobb angle, spinous process angle (SPA) and apical vertebrae rotation (AVR) on posteroanterior (PA) radiographs in AIS
 Authors: Devlin Morrison, Amanda Chan, Doug Hill, Edmond Lou
 Affiliations: U of A

Introduction

Adolescent idiopathic scoliosis (AIS) is a three-dimensional deformity of the spine which affects 2-4% of the adolescent population. The Cobb angle is the 'gold standard' measurement method used to assess the severity of scoliotic curves on posteroanterior (PA) radiographs, and is indicative of the anterior deformity of the spine. The spinous process angle (SPA) and apical vertebral rotation (AVR) have been proposed by researchers as alternative measurements. The SPA measures the deformity of the posterior structures of the spine, and the AVR is indicative of the axial rotation of vertebrae along the transverse plane. We theorize that the rotation of apical vertebrae towards the center of curvature results in a more conservative SPA measure compared to the Cobb angle, and thus the inclusion of AVR should improve the correlation between the Cobb angle and the SPA. This study aims to investigate the correlations between the Cobb angle, SPA, and AVR from the radiographic measurements in AIS patients.

Methods

A retrospective study of 59 AIS patients' standing PA radiographs was performed. The Cobb angle, AVR and SPA of each curve was measured twice by 3 observers of varying experience with one week between measurements in order to eliminate memory bias. The mean absolute difference (MAD), standard deviation (SD), and consistency of each measurement was examined. The Pearson correlation coefficients between any of the two parameters were reported. A multiple regression model was used to examine the correlation between the Cobb angle and the combination of the SPA and AVR.

Results

The Pearson correlation coefficients (r) between Cobb angle and SPA, Cobb angle and AVR, and SPA and AVR were 0.84, 0.47, and 0.31, respectively. These values indicated a strong correlation between Cobb angle and SPA. Using a multiple regression model, the correlation of the Cobb angle and the combined SPA and AVR was 0.87, which was a marginal improvement over the correlation between Cobb angle and SPA. An equation describing this relationship was developed: $\text{Cobb Angle} = 7.10 + 0.72 \text{ SPA} + 0.33 \text{ AVR}$.

Conclusions

The SPA shows a high correlation with the Cobb angle, and including the AVR marginally improves the correlation for the moderate curves which were measured. We hypothesize that the combined SPA and AVR correlation should provide much better correlation with the Cobb angle in severe cases. Further investigation is needed to improve the correlation between the measurements.

Abstract #: 94
 Presenter: Dana Olstad
 Supervisor: Linda McCargar and Kim Raine
 Title: Nudging healthy eating in recreational sports settings
 Authors: Dana Olstad, Linda McCargar, Laksiri Goonewardene, Kim Raine
 Affiliations: U of A

Introduction

Emerging evidence indicates that eating is largely an automatic behaviour governed by environmental cues. Nudging, in which subtle environmental changes are used to shift behaviour in positive, self-interested directions, may therefore support healthier dietary behaviours. This study assessed the comparative and additive efficacy of two nudges and an economic incentive in supporting healthy food purchases by patrons at a recreational swimming pool.

Methods

An initial baseline was followed by three successive and additive interventions that promoted sales of healthy items through: descriptive menu labels, free samples, and 30% price reductions; concluding with a return to baseline conditions. Each period was 8 days in length. Itemized cash register sales data were collected for all items sold. Data were analysed using ANCOVA and adjusted for covariates. Qualitative process observations provided context for quantitative findings.

Results

Healthy items represented 46.2% of menu items and 40.2% of sales. Sales of healthy items were significantly lower than sales of unhealthy items ($p < 0.0001$) and did not differ across periods.

Conclusions

Sales of healthy items mirrored their availability, whereas subtle nudges and price reductions had no impact on sales of healthy items. Increased availability of healthy foods in community recreational sports settings is important because concurrent changes within multiple environments will be needed to improve population-level dietary behaviours. .

Funded by: WCHRI Graduate Studentship, Canadian Foundation for Dietetic Practice and Research

Abstract #: 95
 Presenter: Megan O'Reilly
 Supervisor: Bernard Thebaud
 Title: Using mesenchymal stem cells to treat lung injury: effects in a rat model of bronchopulmonary dysplasia
 Authors: Megan O'Reilly, Marius Moebius, Farah Eaton, Lavinia Ionescu, Saima Rajabali, Rajesh Anthuvan, Arul Vadivel, Bernard Thebaud
 Affiliations: U of A

Introduction

Many preterm infants develop a chronic lung disease known as bronchopulmonary dysplasia (BPD), which interrupts lung development and results in long-term pulmonary complications that reach into adulthood. Mesenchymal stem cells (MSCs) prevent lung injury in experimental BPD in newborn rats. Whether MSCs can restore normal lung growth after established lung injury is clinically relevant, but unknown. Our aim was to determine if administration of MSCs offers any therapeutic benefit to the adult BPD lung.

Methods

Experimental BPD was achieved by exposing newborn rats to 95% O₂ from postnatal day 4-14. Animals were then housed in room air (RA) until adulthood. Controls were exposed only to RA. MSCs were isolated from human umbilical cord and intra-tracheally administered to rats (1x10⁶ cells/kg). Three time-points were investigated: MSC-treatment at 1, 3, and 6 months (mo) followed by harvest at 2, 5, and 8mo respectively.

Results

Adult O₂-exposed rats exhibited persistent lung injury characterized by arrested alveolar growth with air-space enlargement. MSC-treatment at 1 and 3mo partially attenuated injury, but not at 6mo. Lung function parameters were not significantly different between treatment groups at all ages. O₂-exposed rats ran a shorter distance at 1 and 6mo, demonstrating lower exercise capacity, but not at 3mo. Exercise capacity was not significantly different after MSC treatment.

Conclusions

Treatment of the adult BPD lung with MSCs has the potential to improve lung injury if administered at an early stage of adulthood. Further studies are required to determine if cell-based strategies can be optimized to achieve therapeutic benefit later in adulthood.

Funded by: WCHRI Trainee Travel Grant, WCHRI Retention award, U of A, FoMD

Abstract #: 96
 Presenter: Joseph Pagano
 Supervisor: Richard Thompson
 Title: Cardiac magnetic resonance imaging based fat-water myocardial T1 mapping using IDEAL-T1
 Authors: Joseph Pagano, Kelvin Chow, Ray Yang, Richard Thompson
 Affiliations: U of A

Introduction

Myocardial T1 mapping is a powerful tool cardiac magnetic resonance (CMR) technique that allows for quantitative tissue characterization and has been used to study many disease states including heart failure, aortic stenosis, and several cardiomyopathies. The presence of intramyocardial or epicardial fat can lead to unintentional inclusion during analysis, particularly in areas of infarct and/or thin wall myocardium. This may be especially important when studying the thin walled right ventricle, an important structure in many forms of congenital heart disease.

Methods

We developed a novel CMR pulse sequence that combines fat-water separated imaging, based on the "iterative decomposition of water and fat with echo asymmetry and least squares estimation" (IDEAL) method, with a saturation-recovery method for T1 mapping (IDEAL-T1). Validation was performed using Bloch equation simulations of the pulse sequence, as well as evaluation against a reference standard T1 mapping sequence (SASHA) in phantoms and healthy controls at 1.5T.

Results

Simulations reveal T1 accuracy is dependent on absolute T1, flip angle, and saturation pulse efficiency, while being independent of T2 dephasing and off resonance. Phantom studies show excellent T1 correlation between IDEAL-T1 and SASHA over a wide range of T1 values (R² = 0.9998, p < 0.0001), with an average difference between sequences of -8.3 ms on the fat-water combined images and -8.7 ms on the water only images. In vivo evaluation shows generally good agreement between IDEAL-T1 and SASHA on a small set (n = 6) of healthy individuals, with an average difference of -47.2 ms on the fat-water combined images (1143.9 vs. 1191.2 ms), and -40.2 ms on the water only images (1151.0 vs. 1191.2 ms), however the correlation was not statistically significant.

Conclusions

IDEAL-T1 provides a novel method for T1 mapping allowing for fat-water separated analysis. This should allow for analysis in areas where epicardial fat may interfere with the ability to obtain reliable data, including thin walled myocardium such as the right ventricle.

Funded by: WCHRI Graduate Studentship, AIHS Clinician Fellowship Award





Abstract #: 97
 Presenter: Annie Pentney
 Supervisor: Shannon Scott
 Title: Data presentation for national prioritization in a pan-Canadian study
 Authors: Annie Pentney, Lauren Albrecht, Shannon Scott
 Affiliations: U of A

Introduction

Determining health professionals' perspectives on how to feedback research findings is an important research issue. One of the key aspects of knowledge translation is to present research findings using approaches that inform and engage the audience. Translating Emergency Knowledge for Kids (TREKK) is a 4-year nationally funded, multiphase study spanning 35 sites across Canada. The purpose of TREKK is to mobilize specialized pediatric health care knowledge by sharing it with general emergency departments, with the aim of improving pediatric health outcomes. Over the past year, the Health Care Professional Needs Assessment (Phase 1 of TREKK) has collected survey data from approximately 1700 health professionals regarding clinical knowledge needs and preferences for finding clinical information. The results from the survey data are shared with the Prioritization Committee, a board of health professionals who determine national knowledge priorities and allocate resources for knowledge mobilization efforts in TREKK. The purpose of my summer studentship project was to determine the most effective method to present this feedback data to a multidisciplinary team charged with determining national priorities for pediatric emergency care.

Methods

Two methods of presenting the TREKK survey data (traditional bar graphics/tables, and infographics) were produced and an anonymous online survey was conducted with members of the Prioritization Committee (n=17) to assess their perceptions of the data presentation formats. The online survey assessed the perceived clarity, comprehensibility, and aesthetic appeal of each format.

Results

There was a 94% response rate to the survey. 81% of participants preferred the infographic format overall, and infographics were rated higher in all categories (clarity, comprehensibility and aesthetic appeal).

Conclusions

This study set out to understand health professionals' views on which method of presenting feedback was the most effective in the context of determining national priorities for pediatric emergency care. In this project, the infographic format was found to be more effective than the traditional method for presenting feedback data to a multidisciplinary team. The findings reported here are from one project within a team of 17 multidisciplinary health professionals, therefore they cannot be generalized. However, these findings provide future considerations for feeding back data regarding the preference for the infographic format in data presentation.

Funded by: WCHRI Partnership

Abstract #: 98
 Presenter: Todd Radostits
 Supervisor: Lesley Mitchell
 Title: ABO blood group genotype and factor VIII plasma levels are risk factors for thrombosis in pediatric cancer patients
 Authors: Todd Radostits, Kevin Dietrich, Ketan Kulkarni, Lesley Mitchell
 Affiliations: U of A

Introduction

Thirty percent of pediatric cancer patients develop a thrombosis while undergoing treatment for cancer. In adult populations constitutively elevated factor VIII plasma levels and blood group genotype have been shown to be risk factors for venous thrombosis. We used a case-control cohort of pediatric cancer survivors to determine if constitutively elevated factor VIII plasma levels and blood group genotype could identify patients at risk of developing a thrombosis during cancer treatment. Identifying these children would allow targeted anticoagulation therapy at only this patient population because pediatric cancer patients as a group do not receive primary prophylaxis with anticoagulation due to the increased risk of bleeding.

Methods

Factor VIII plasma levels were determined using a functional coagulation assay and blood group was genotyped using 3 SNPs: rs8176719, rs505922, and rs8176746. Two hundred and twenty four patients: 68 cases and 156 controls, were genotyped for blood group and assayed for plasma FVIII levels.

Results

Plasma FVIII levels were 1.3 (± 0.5) U/ml in cases and 1.1 (± 0.4) U/ml in controls. Among the cases, 21 patients (30.9%) had blood type OO. In the control population, 76 patients (48.7%) had blood type OO ($p=0.0142$). Patients with non-OO blood type had a 2.1 fold increased odds (OR: 2.12, 95% CI: 1.16-3.88) of VTE as compared to patients with OO blood type. FVIII levels were correlated to blood type for all patients with a range of 0.99 (± 0.28) U/ml for OO genotype to 1.5 (± 0.79) U/ml for AA genotype.

Conclusions

In this case control study, 2 risk factors were identified for pediatric cancer patients at risk for VTE: FVIII levels and blood type. Patients with non-OO blood type had over two fold increased odds of VTE. Future research will focus on identifying other thrombotic markers in the two populations.

Funded by: WCHRI Summer Studentship

Abstract #: 99
 Presenter: Seema Rajani
 Supervisor: Justine Turner
 Title: Exploring ethnic differences in children diagnosed with celiac disease at a Canadian pediatric celiac clinic
 Authors: Seema Rajani, Abeer Alzaben, Jessica Sawyer-Bennett, Leanne Shirton, Rabindranath Persad, Hien Huynh, Diana Mager, Justine Turner
 Affiliations: U of A

Introduction

Celiac Disease (CD) is a common autoimmune disorder with an increasing prevalence seen in ethnic minorities. Such groups may be disadvantaged, in regards to education for the gluten free diet (GFD), given language barriers. The purpose of this study was to report the frequency of ethnic minorities diagnosed with CD in a Canadian pediatric Multidisciplinary Celiac Clinic. Our aim was to determine if differences were present between the main ethnicities during one year of follow up on a GFD.

Methods

Patients with biopsy proven celiac disease diagnosed at the Multidisciplinary Celiac Clinic at the Stollery Children's Hospital from 2008-2011 were identified through the clinic database. Baseline and follow up data at 6 months and 1 year were collected. This data included demographics, symptoms, anthropometrics and laboratory investigations, including serum IgA anti-tissue transglutaminase (aTTG). Ethnicity was determined through self-report during medical interviews.

Results

272 patients were identified, 80% (n=218) were Caucasian (Group 1) and 20% (n=54) were other ethnicities. South Asians (Group 2) made up 81% (n=44) of the minority population. No differences in age or gender were found between the groups. Group 1 presented more often with GI symptoms (71% vs 43%; $p < 0.001$) and less often with growth concerns (21% vs 68%; $p < 0.001$) than Group 2. Both groups reported symptom improvement at 6 months and 1 year. At diagnosis, serum aTTG was consistently lower in Group 1 compared to Group 2 (367 IU/ml vs 834 IU/ml; $p < 0.001$). The percentage decline in aTTG over six months was significantly greater for Group 1 (86% vs 60%; $p < 0.001$). At the end of one year, more Group 1 patients had a normal aTTG compared to Group 2 (64% vs 29%; $p < 0.001$).

Conclusions

Even though they represent a minority group, South Asian children are a significant portion of CD patients in a Canadian Celiac Clinic. Presenting symptoms of South Asian children are different to Caucasian children and this has implications for a timely diagnosis in this population. In this regard, it is noteworthy that aTTG is higher at presentation in this subgroup, and levels are slower to normalize over one year on a GFD. This suggests that careful follow up and culturally aware educational supports should be developed for South Asian children with CD.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 100
 Presenter: Ann Revill
 Supervisor: Gregory Funk
 Title: Towards a greater understanding of airway control: do Dbx1-derived neurons give rise to XII inspiratory premotoneurons?
 Authors: Ann Revill, Andrew Kottick, Victoria Akins, Paul Gray, Christopher Del Negro, Gregory Funk
 Affiliations: U of A

Introduction

The control of upper airway muscle activity must be understood to make advances in treating obstructive sleep apnea (OSA), which affects ~5% of adults and 2-5% of the pediatric population. Rhythmic activation of the genioglossus muscle (GG), a tongue protruder, plays a key role in maintaining airway patency during inspiration. Reduced tonic and inspiratory activity in XII motoneurons (MNs) that innervate the GG is strongly implicated in OSA. During sleep, this reduced activity is hypothesized to result from loss of excitatory modulation as well as glutamatergic inspiratory drive, which derives from the preBöttinger Complex (preBötC; generates the drive) via inspiratory XII preMNs (transmit drive from preBötC to XII MNs). Reduced excitability and output of glutamatergic inspiratory preMNs may contribute significantly to the reduced activity of XII MNs during sleep. Unfortunately, little is known about inspiratory preMNs as they are sparsely distributed in the medullary intermediate reticular formation (IRt) and are difficult to distinguish from other neurons. Transcription factor analysis has revealed a subpopulation of Dbx1-derived neurons in the IRt that are largely glutamatergic. We hypothesize that ipsilaterally-projecting XII inspiratory preMNs are derived from Dbx1 progenitors.

Methods

Rhythmic, transverse medullary slices (550 μ m) were generated from Dbx1^{ERC}CreT2; R26tdTomato neonatal mice (postnatal day 0-4). Inspiratory-related activity was recorded from the XII nerve. Dbx1 neurons in the IRt were examined for inspiratory activity using calcium-imaging, on-cell and whole-cell recording techniques.

Results

Rhythmic calcium oscillations (n=2) and synchronous bursts of action potentials (on-cell recording, n=1) recorded from IRt Dbx1 neurons were in phase with XII motor output. Whole-cell recordings also revealed inspiratory-modulated Dbx1 neurons in the IRt. Nine Dbx1 neurons depolarized or fired volleys of action potentials in phase with inspiratory-related XII nerve activity. Antidromic stimulation of a non-rhythmic Dbx1 neuron from the XII nucleus demonstrated that some Dbx1 neurons have ipsilateral projections to the XII nucleus.

Conclusions

Our data indicate that ~20% of Dbx1-derived neurons in the IRt receive inspiratory drive. Additional anatomical and electrophysiological measurements will be required to determine whether these neurons are XII inspiratory preMNs.

Funded by: WCHRI Innovation Grant, CIHR, NSERC, WCHRI, AIHS, CFI, ALA, NIH





Abstract #: 101
 Presenter: Laura Reyes
 Supervisor: Sandra Davidge
 Title: Vascular effects of aerobic exercise training in an animal model of hypoxia-induced intrauterine growth restriction
 Authors: Laura Reyes, Jude Morton, Raven Kirschenman, Amin Shah, Sandra Davidge
 Affiliations: U of A

Introduction

Hypoxia is a critical insult causing intrauterine growth restriction (IUGR) in many pregnancy complications. Adult offspring born with hypoxia-induced IUGR have a decrease in cardiac performance after ischemia and a reduction in nitric oxide (NO)-mediated vasodilation. We used aerobic exercise as a possible intervention to prevent hypoxia-induced cardiovascular complications. We hypothesized that aerobic exercise training will improve vascular function in offspring born from a hypoxic environment in utero by increasing NO bioavailability and decreasing oxidative stress.

Methods

We used a model of hypoxia-induced IUGR. Pregnant Sprague Dawley rats were exposed to control (21% oxygen) or hypoxia (11% oxygen) conditions from gestational day 15 to 21. Male and female offspring from normoxic (control) and hypoxic (IUGR) pregnancies were randomized at 10 weeks of age to either an exercise-trained or sedentary group. Rats were acclimatized to treadmill running then exercised for 6 weeks; 5 consecutive days/week, 30 min/day at 20 m/min. After a recovery period of 24 hours, animals were euthanized and second order mesenteric arteries were isolated and mounted on a wire myograph. Cumulative concentration response curves to methacholine (MCh) were performed in the presence of the NO synthase inhibitor (L-NAME, 100 μ M/L) or the superoxide dismutase mimetic (MnTBAP, 10 μ M/l).

Results

Exercise enhanced vasodilation in mesenteric arteries from control female offspring (pEC₅₀ in sedentary 7.25 \pm 0.11 vs. exercise 7.53 \pm 0.08; p<0.05) and control male offspring (pEC₅₀ in sedentary 7.32 \pm 0.08 vs. exercise 7.69 \pm 0.07; p<0.05). Exercise also enhanced vasodilation in IUGR female (p<0.05) but not male IUGR offspring (p= 0.8). Area under the curve (AUC) analysis from arteries incubated with and without L-NAME, showed that exercise improved NO-mediated vasodilation in only female control offspring (AUC in sedentary 50.28 \pm 10.45 vs. exercise 90.23 \pm 12.72; p<0.05) but not male control or either IUGR groups. No differences were found in vasodilation to MCh in the presence of MnTBAP.

Conclusions

Our data suggest that exercise improves vasodilation in female but not male IUGR offspring. Contrary to our hypothesis, exercise did not improve NO-mediated vasodilation in IUGR offspring. In IUGR females, however, there appeared to be a compensatory vasodilatory pathway that was absent in IUGR males.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 102
 Presenter: Taylor Rocque
 Supervisor: Lori West
 Title: A mouse model for ABO-incompatible transplantation (ABOi tx): study of hyperacute rejection following ABOi heart tx
 Authors: Taylor Rocque, Fahim Rahman, Sheila Wang, KeSheng Tao, Thuraya Marshall, Jean Pearcey, Banu Sis, Michael Mengel, Anthony d'Apice, Bruce Motyka
 Affiliations: U of A

Introduction

ABOi heart Tx (HTx) results in rapid graft loss by hyperacute antibody-mediated rejection (HAR) when accidentally performed in adults. In contrast, ABOi HTx can be performed in infants safely and results in tolerance to the donor blood group antigen(s). A mouse model would be useful for the study of antibody-mediated rejection (AMR) and tolerance in the setting of ABOi Tx. We developed transgenic mice [A-Tg, C57BL/6 (B6) background] that express human A-antigen on the vascular endothelium. 'A into O' Tx can be approximated using A-Tg mice as donors and B6 wild-type (WT) mice as recipients. We hypothesize that administration of high levels of anti-A antibody (Ab) to young WT recipients with A-Tg heart grafts will result in HAR.

Methods

Young B6 mice with undetectable anti-A titres were heterotopically transplanted with A-Tg hearts (n=6) and 6-8 days later injected intravenously with mouse anti-A monoclonal IgM Ab plus rabbit complement. Heart grafts were monitored by palpation [score of 4 (strongest) to 0 (absence of pulsation)] and harvested 24 hr post-injection. Grafts were assessed for AMR by H&E staining and by immunohistochemistry for the deposition of complement C4d. Anti-A Ab titre was determined by hemagglutination.

Results

In all of the A-Tg heart recipients, anti-A Ab titres increased from \leq 1:2 just prior to anti-A antibody injection to \geq 1:1024 60 min post-injection. Heart palpation scores were 4 prior to injection and ranged from 1-4 post-injection. There was histological evidence of AMR in the A-Tg heart grafts and preliminary studies confirmed deposition of C4d.

Conclusions

These findings are indicative of HAR following passive anti-A Ab treatment. This model will prove useful for the study of AMR in the setting of ABOi Tx.

Funded by: WCHRI, Heart and Stroke Foundation of Canada, Northern Alberta Clinical Trials and Research Centre (NACTRC) Summer Studentship

Abstract #: 103
 Presenter: Ian Rodger
 Supervisor: Eytan Wine
 Title: Secretory immunoglobulin-A/G and the intestinal microbial composition of pediatric Inflammatory Bowel Disease
 Authors: Ian Rodger, Yuefei Lou, Eytan Wine
 Affiliations: U of A

Introduction

Inflammatory bowel diseases (IBD) are a group of chronic gut illnesses that commonly present in childhood. IBD is caused by a deregulated immune response to gut microbes in genetically predisposed individuals. IBD is also associated with changes in intestinal microbial composition. Two key players in the intestinal immune system are secretory immunoglobulin-A (IgA) and IgG, which bind and neutralize gut microbes. The goal of this study was to better understand the relationship between intestinal IgA/G and resident microbes in the context of pediatric IBD.

Methods

Samples were collected from the terminal ileum (TI) of patients undergoing endoscopy by a staff gastroenterologist. Fresh samples were centrifuged and the resulting bacterial pellet was fixed in PFA. Detection of IgA and IgG: Western blotting was used to detect the presence of IgA and IgG in intestinal samples. Briefly, filtered TI aspirate was run on a SDS-polyacrylamide gel (10%) and subsequently incubated with a primary antibody (Rabbit-anti-human IgA or rabbit-anti-human IgG) and then a fluorescent secondary antibody (Goat-anti-human, IRDye cw600). Detection of IgA/G-Bound Bacteria: Bacteria were stained for the presence of IgA and IgG using rabbit-anti-human IgA/G antibodies and a fluorescently labelled secondary antibody (FITC). Microbial Composition: FISH was used to determine microbial composition. Known bacterial were fixed and incubated with fluorescently labelled oligonucleotide probes for key bacteria genera (Total bacteria, *E. Coli*, *Clostridium*, *Bifidobacterium*, *Bacteriodes*).

Results

The presence of free IgA/G in the mucosal samples was confirmed by western blot, and the presence of IgA/G-bound bacteria was confirmed by immunofluorescent staining. Taken together, these results demonstrated that our method of sample collection yields high levels of IgA/G-bound bacteria suitable for downstream analysis. FISH probes for *Clostridium* and *E. Coli* were shown to be specific using known bacterial species; however no obvious difference in composition of these microbes was seen between the IBD sample and healthy control sample in our preliminary study.

Conclusions

These preliminary results demonstrate that our method of collecting TI aspirates is effective in recovering IgA/G antibodies along with IgA/G-bound bacteria. I have also demonstrated that FISH can be used to analyze microbial samples collected from ileal washes.

Funded by: WCHRI Summer Studentship, NASPGHAN Mentored Summer Studentship

Abstract #: 104
 Presenter: Lori-Ann Sacrey
 Supervisor: Lonnie Zwaigenbaum
 Title: Visual attention in infants at high-risk for autism: A longitudinal study from 6-to-36-months-old
 Authors: Lori-Ann Sacrey, Susan Bryson, Lonnie Zwaigenbaum
 Affiliations: U of A

Introduction

Regulation of visual attention is essential to learning about one's environment. Children with Autism Spectrum Disorder (ASD) exhibit impairments in regulating their visual attention, but little is known about how such impairments develop over time. This prospective longitudinal study is the first to describe the development of components of visual attention, including engaging, sustaining, and disengaging attention, in infants at high-risk of developing ASD (each with an older sibling with ASD).

Methods

Non-sibling controls and high-risk infant siblings were filmed at 6, 9, 12, 15, 18, 24, and 36 months of age as they engaged in play with small, easily graspable toys. Duration of time spent looking at toy targets before moving the hand towards the target and the duration of time spent looking at the target after grasp were measured. At 36 months of age, an independent, gold standard diagnostic assessment for ASD was conducted for all participants.

Results

As predicted, infant siblings subsequently diagnosed with ASD were distinguished by prolonged latency to disengage ('sticky attention') by 12 months of age, and continued to show this characteristic at 15, 18, and 24 months of age. The results are discussed in relation to how the development of visual attention may impact later cognitive outcomes of children diagnosed with ASD.

Conclusions

Infants who go on to receive a diagnosis of ASD show an impairment in latency to disengage by 12 months of age. This latency may be useful as a biomarker for the early identification of ASD in infants at-risk.





Abstract #: 105
 Presenter: Amber Savage
 Supervisor: David McConnell
 Title: The subjective well-being of Canadian youth with parent report disability: a structural equation modeling analysis
 Authors: Amber Savage, David McConnell
 Affiliations: U of A

Introduction

There is growing evidence of disability-based disparities in the life conditions and well-being of youth in high income countries. Compared with their non-disabled peers, youth with disabilities tend to report lower levels of happiness, lower overall life satisfaction, and higher rates of suicidal ideation. This study provides a snapshot of ongoing research exploring disability-based disparities in the subjective well-being of Canadian adolescents. The global aim of this research is to enhance our understanding of disability-based inequities in the distribution of well-being in Canada, and identify mechanisms linking disability, disadvantage and subjective well-being.

Methods

The primary methodology of this study was secondary data analysis of the National Longitudinal Survey of Children and Youth (NLSCY). A sample of 14 to 15 year olds (n=5,940) was drawn from the original NLSCY cohort; of this sample 750 youth were reported by their parent to have a disability. Structural equation modeling techniques were employed to investigate inter-relationships between disability, life circumstances and well-being, from middle childhood into adolescence.

Results

Based on preliminary analysis of the NLSCY data (Savage & McConnell, 2012) as well as a growing body of research literature, we expected to find a significant difference in the SWB of youth with parental report disability. Interestingly, we found few differences based on disability as identified prior to adolescence. These youth were indeed more likely to report lower life satisfaction as well as previous suicidal ideation. However, differences in indicators of positive and negative affect were negligible.

Conclusions

These findings suggest that Canadian youth with parent report disability, in the most general terms, are faring well relative to their same age peers. While promising, the results are somewhat inconsistent with recent research in similar populations from other high income countries. Implications and future research directions are discussed.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 106
 Presenter: Shubham Shan
 Supervisor: Patricia Massicotte
 Title: Thrombosis in children: Further evaluation of incidence and resolution
 Authors: Patricia Massicotte, Mary Bauman, Aisha Bruce, Shubham Shan, Laszlo Bajzar, Michelle Bauman
 Affiliations: U of A

Introduction

Thrombosis in children most often occurs in children with life-threatening health conditions. The incidence of thrombosis in children is reported to be highest among infants ≤ 1 year of age and is associated with severe sequelae including loss of venous access. Thrombus resolution has not been adequately explored in children and is reported to be only 22% among adults. In these children central vascular access is essential to their survival. Consequently, anticoagulation is commonly used to prevent extension thereby allowing fibrinolysis. Determination of thrombus resolution may influence duration of therapy.

Methods

This single centre, quaternary care children's hospital, retrospective study included all pediatric patients objectively diagnosed with arterial or venous thrombosis from 2003-2012. Children with thrombosis, and available for follow-up, underwent repeat imaging to evaluate thrombus resolution at 2, 4 and 12 weeks post diagnosis. Intracerebral and intracardiac thrombi were excluded. Thrombosis was treated in 91% of this population. For analysis, children were divided into age groups consistent with developmental hemostasis (≤ 3 months 3.1-12 m, 1-5 years, 6-18 years). Thrombotic events were further subdivided into arterial and venous. Resolution was evaluated through objective diagnostic imaging to determine when complete resolution (CR) occurred. Medical records were reviewed to determine patient characteristics, first thrombotic event, and degree of resolution when available. Ethics approval was obtained.

Results

504 children were diagnosed with arterial or venous thrombosis. 284(56%) were male. 234 (46%) had congenital heart disease. 232 (46%) infants were ≤ 3 months of age, 97 (19.2%) were aged $>3-12$ months of age, 90 (17%) and 85 (17%) 1-5 years and $\geq 5-18$ years respectively. Follow up imaging was available in 78% of all children. In infants ≤ 3 months of age full resolution occurred in 42/63(67%) and 57/117(49%) for arterial and venous thrombosis. Of those, CR at 2, 4, 12 weeks was 14/42 (33%), 27/42(64%), 42/42 (100%) and 17/57 (30%), 29/57(51%), 52/57(91%), for arterial and venous thrombi respectively. In infants, $>3-12$ months CR occurred in 18/22(82%) and 27/55(49%), for arterial and venous, respectively. Of those, CR at 2,4,12 weeks was 9/18(50%), 13/18(72%), 18/18(100%) and 8/55(15%), 12/55(22%), 24/55(44%) for arterial and venous thrombi, respectively. CR was not different between 1-5 and 6-17 years and was therefore combined. Of those, CR occurred in 15/21(71%) and 63/116(54%) by 12 weeks 14/15(93%) and 49/63(77%) for arterial and venous thrombosis, respectively.

Conclusions

This is the first report which defines the population with the highest incidence of thrombosis as infants' ≤ 3 months of age. Unlike older children and adults, CR occurred at 4 weeks for 64% and 41% of arterial and venous thrombosis for infants' ≤ 3 months, respectively. CR occurred at 4 weeks in 72% of arterial thrombi in infants' ≤ 12 months. Given this incidence of CR of thrombi at 4 weeks, imaging at 4 weeks should be considered if anticoagulation is ongoing. These findings validate the need for studies evaluating thromboprophylaxis. Well designed studies evaluating duration of therapy of are urgently needed.

Abstract #: 107
 Presenter: Mordechai Slae
 Preceptor: Hien Q Huynh
 Title: Role of air pollution in Eosinophilic Esophagitis
 Authors: Mordechai Slae, Aldrich Leung, Amr Abdel-Radi, Jesus Serrano Lomelin, Alvaro Osornio-Vargas, Rabin Persad, Hien Q Huynh
 Affiliations: U of A

Introduction

Eosinophilic Esophagitis (EoE) is a chronic disease, characterised by swallowing difficulties and stricture formation. Not much is known about risk factors; however allergic diseases are common among patients. The recent emergence of the disease and the increase in the incidence implicate a role for environmental factor. A role for air born particles is supported by mouse models and by the seasonal variation in clinical symptoms and mucosal eosinophil counts. We aimed to examine whether there is a role for air pollution in the development of EoE.

Methods

Children (1 to 18 years) were recruited through pediatric GI clinics at the Stollery children's hospital. Apart from demographic and medical background, we collected 6-digits postal codes which were translated into geocodes by reverse geocoding resource. We co-located emitting points' coordinates using data from the National Pollutant Release Inventory (NPRI), which follows up on air pollution emitting facilities in Canada. The distance of each subject residency location to the nearest emitting facility was measured using a Geographic Information System Software.

Results

A total of 85 patients and 100 controls were recruited. The average distance from each subject's residency to the nearest emitting facility was significantly smaller among patients as compared to controls (2.3 vs. 3.3 km respectively, $p=0.001$). A subgroup analysis of participants who have only had one postal code for their entire life revealed similar results. Cumulative frequency analysis revealed that EoE patients live closer to air pollution releasing facilities. This effect wanes at about 4.5 km, which is generally considered the radial area covered by an emitter in its center. No more cases are identified behind this distance mark, while controls continue naturally to appear.

Conclusions

The average distance between EoE patients' residency and air pollution emitters is shorter as compared to controls. As the next step, we would like to analyze the distance to specific air pollutants emitters as well as to major roads, and plan to test collected urine samples for specific air pollution markers.

Abstract #: 108
 Presenter: Tara Stach
 Supervisor: Ordan Lehmann
 Title: Identification of the superior ocular fissure
 Authors: Tara Stach, Jakub Famulski, Jennifer Hocking, Ordan Lehmann, Andrew Waskiewicz
 Affiliations: U of A

Introduction

We have identified five patients who possess superior ocular colobomata, a novel birth defect associated with eye morphogenesis. Morphological and immunohistochemical examination of zebrafish eye development have revealed the presence of a transient fissure within the dorsal (superior) retina, indicating the presence of an evolutionarily morphogenetic conserved structure. Our goal is to understand the molecular causality of superior colobomata disorders.

Methods

To identify the genetic causality of superior colobomata, we employed Sanger and Exome sequencing. To examine the role of genes in the dorsal retina, we employed Morpholino-based gene knockdown, in situ hybridization and immunohistochemistry.

Results

Sequence analysis of a patient with unilateral superior coloboma revealed biallelic mutations in CYP1B1, with functional assays showing significantly reduced enzymatic activity. Restricted expression of zebrafish *cyp1b1* to the dorsal retina, and prior research demonstrating enzymatic activity in synthesizing retinoic acid (RA) led us to suspect a role for RA in the closure of the superior ocular fissure. Knock-down of zebrafish *cyp1b1* results in a loss of RA-dependent signaling and an increase in the duration of ocular fissure opening. The dorsal retinal expression of *cyp1b1* mRNA is dependent on the Bone Morphogenetic Protein (BMP), *Gdf6a*. Consistent with this finding, zebrafish *gdf6a* mutants fail to close their superior fissures. Supplementation of zebrafish superior coloboma models with RA rescues these phenotypes. We next investigated the mechanisms that specify the position of the superior fissure. The expression boundaries of the forkhead box transcription factors *foxd1* (nasal retina) and *foxd1* (temporal retina) precisely align with the locations of the superior fissure. We find that knock-down of *Foxd1* or *Foxg1* results in aberrant superior fissure formation.

Conclusions

We have identified a novel transient fissure in the developing superior retina, a structure that is conserved over 450 million years of evolution. Closure of the transient, superior ocular fissure during development is controlled by BMP signaling, CYP1B1 and retinoic acid. The position of the superior (dorsal) retinal fissure is specified by the combined activation of the forkhead box genes, *foxd1* and *foxd1*.

Funded by: WCHRI Graduate Studentship





Abstract #: 109
 Presenter: Sarah Treit
 Supervisor: Christian Beaulieu
 Title: White matter correlates of behavioural inhibition in healthy childhood development
 Authors: Sarah Treit, Carmen Rasmussen, Christian Beaulieu
 Affiliations: U of A

Introduction

Inhibitory control and cognitive inhibition are key executive functions that develop in childhood and adolescence, increasing one's capacity to respond dynamically to changing demands and refrain from impulsive behaviours. These gains evolve in concert with significant brain development. Functional MRI studies have identified frontal and cingulate areas associated with performance on inhibition tasks, but less is known about the role of underlying white matter connectivity.

Methods

Diffusion tensor imaging (DTI) was used to examine correlations between fractional anisotropy (FA; a measure of white matter 'integrity') and performance on the NEPSY-II Inhibition test (Naming, Inhibition and Switching conditions) in 49 healthy 5-16 year olds (20 girls, 29 boys). Whole brain voxel-wise analysis was performed to identify clusters where FA correlates with NEPSY-II scaled scores. Tractography through each cluster was then carried out in native space for each individual, and step-wise regression was used to test the relationship between NEPSY-II scores and FA of these white matter tracts.

Results

Voxel-wise analysis revealed a cluster in the splenium of the corpus callosum where higher FA correlated with lower inhibition scores, and two clusters in the frontal lobes where higher FA correlated with lower Switching scores (voxel-wise $p < 0.001$, cluster-wise $p < 0.001-0.034$). Step-wise multiple regression of tractography revealed negative correlations between temporal and posterior parietal projections of the corpus callosum with Inhibition scaled scores and total errors, respectively, whereby higher FA was associated with poorer performance. Several FA-by-gender interactions were also observed for Inhibition and Switching completion times.

Conclusions

White matter FA, known to change with age during development, is shown to correlate with standardized measures of inhibitory control in 49 healthy children and adolescents. Gender differences in white matter maturation are also shown to influence these emerging executive functions. These findings will help broaden our understanding of the development of inhibition and cognitive control, the underlying role of white matter, and may help to identify deviations of neurobiology in adolescent psychopathology.

Funded by: WCHRI Graduate Studentship

Abstract #: 110
 Presenter: Conrad Tsang
 Supervisor: Amanda Newton
 Title: First Nations children demonstrate higher rates of emergency department visits for suicide-related behaviours and longer times to mental health care follow-up in Alberta
 Authors: Conrad Tsang, Rhonda Rosychuk, Amanda Newton
 Affiliations: U of A

Introduction

Suicide is the second highest cause of mortality in youth aged 15-24 in Canada, with First Nations adolescent suicide rates consistently higher than the general population. Youth engaging in suicide-related behaviours (SRBs) who seek medical care are at higher risk for suicide completion, and those who present to emergency departments (EDs) for medical care may not receive necessary mental health care after discharge.

Methods

In this study, we examined trends in ED visits by children <18 years for SRBs and post-ED health care utilization. A 6-year (2002-2008), population-based cohort of all ED visits by children for SRBs in Alberta was constructed to establish directly standardized visit rates (DSVRs) and median estimated times to post-discharge physician follow-up. Data were analyzed among First Nations children and three other socio-demographic groups based on government subsidy levels: regular plan participants (no subsidy), welfare recipients, and government-sponsored program recipients (low income).

Results

During the study period, DSVRs for First Nations children increased slightly but decreased for all other groups. In 2007/2008, First Nations children aged 15-17 years had the highest DSVRs for girls (1510/100,000) and boys (750/100,000), whereas children from families without subsidy had the lowest rates (girls 371/100,000; boys 125/100,000). Although First Nations children represented 17.8% of the post-ED discharge cohort, they had disproportionately fewer physician follow-up visits by 7 days (7.7%) compared to children from families without subsidy, who represented 54.0% of the cohort and made 60.0% of the visits. The median time to physician follow-up for First Nations children was 34 days (95% CI: 20-85) versus 19 days (95% CI: 11-31) for children from families receiving subsidy from government-sponsored programs.

Conclusions

Our results suggest that health care resources currently available for First Nations children are not sufficient in addressing SRBs. Strengthening culturally-based interventions may reduce crises presenting to EDs and expedite post-discharge care.

Funded by: WCHRI Summer Studentship CIHR, AIHS

Abstract #: 111
 Presenter: Megan Ure
 Supervisor: Todd Alexander
 Title: Hypercalciuria is caused by a mutation in a 5' URE of Claudin-14 that introduces a novel INSM1 transcription factor binding site
 Authors: Megan Ure, Jawad Alzamil, Wanling Pan, Todd Alexander
 Affiliations: U of A

Introduction

Kidney stones are prevalent and painful. The greatest risk factor for kidney stones is hypercalciuria (i.e. urine with excess calcium), for which the etiology is unknown. A recent GWAS study linked hypercalciuria to Claudin-14, however it failed to identify the molecular mechanism mediating the disease. Our lab recently determined a role for CLDN14 in inducing calcium excretion when plasma calcium levels are elevated. We hypothesized therefore that children with kidney stones may have a mutation in CLDN14 increasing its expression.

Methods

Genetic sequencing of the terminal region of CLDN14 was performed on DNA from 16 children with idiopathic hypercalciuria. Dual luciferase assays were used to test for the presence of a regulatory region. Stable cell lines were created by placing the potential regulatory region in front of the SV40 promoter and the CLDN14 coding sequence. Quantitative real-time PCR and western blotting were used to examine genomic DNA, mRNA, and protein levels. In silico studies were used to predict transcription factor binding sites.

Results

We found an intronic SNP that occurred with greater frequency in children with kidney stones relative to ethnically matched controls (from the 1000 genome project). Using dual luciferase assays we found the mutant sequence doubled expression while the wild type had no effect (relative to empty vector). In the stable cell lines, we found that a similar number of the construct was incorporated into the genomic DNA, however the mutant sequence doubled mRNA and protein expression. In silico studies predicted the SNP introduced a novel INSM1 transcription factor binding site. To test whether this is the case, we expressed the WT and mutant luciferase constructs in the presence and absence of INSM1 and found a further increase in expression when INSM1 was over-expressed.

Conclusions

Our data strongly suggests that some children with hypercalciuria and kidney stones have a mutation in the 5' intronic region of CLDN14 that introduces a novel INSM1 binding site.

Funded by: WCHRI Innovation Grant|Summer Studentship

Abstract #: 112
 Presenter: Sunita Vohra
 Supervisor:
 Title: Systematic review of the safety of mind-body interventions in children
 Authors: Meagan Lyszczzyk, Denise Adams, Sunita Vohra
 Affiliations: U of A

Introduction

Randomized-controlled trials (RCTs) are relied upon to provide high quality clinical evidence. The validity of any trial's results depends on the validity of its outcome measurement tools. Furthermore, the Consolidated Standards of Reporting Trials (CONSORT) group encourages researchers to completely define outcomes. Yet, many RCTs still fail to clearly define their primary outcome(s) and/or their measurement tool properties (e.g. validity, reliability). The objectives of this study are to assess pediatric anxiety RCTs to identify adequacy of reporting of: i) primary outcome(s); ii) measurement properties of the primary outcome measure(s); and iii) adverse events.

Methods

Embase, CINAHL, the Cochrane Central Register of Controlled Trials and Medline were searched for RCTs of pediatric anxiety published since 2001. Two reviewers independently conducted screening and data were extracted using a standardized form. Variables extracted included: journal title, participant age range, sample size, condition under study, intervention, control, as well as reporting of primary outcome(s), outcome measurement tool properties and adverse events.

Results

7014 references were identified and reduced to 614 articles based on screening titles and abstracts. Of these, 105 articles met inclusion criteria. Most (58%) did not clearly identify a primary outcome. 220 unique outcomes were assessed in these trials using 546 measurement tools. Psychometric properties were only provided for 55% of tools. Most (65%) articles failed to make any mention of the presence or absence of adverse events for the intervention under study.

Conclusions

Substantial heterogeneity exists in pediatric anxiety RCTs, suggesting the need for the development of a core outcome set. Primary outcomes reporting in this field is in need of improvement, as is reporting of the measurement properties of the outcome measurement tools used. Use of a standard set of validated outcome measurement tools would allow for more meaningful synthesis of results. Improved reporting of the presence or absence of adverse events is essential.





Abstract #: 113
 Presenter: Jenny Yoon
 Supervisor: Sujata Persad
 Title: Neuroprotective effects of sulforaphane on hypoxic-ischemic neurons
 Authors: Jenny Yoon, Jerome Yager, Sujata Persad
 Affiliations: U of A

Introduction

Cerebral Palsy (CP) constitutes the primary outcome of premature nerve injury. 80-90% of CP is now known to occur during the last trimester prior to the onset of labour & delivery. Impairment of oxygen and glucose supply during pregnancy to the fetus can induce neuron damage and death. Mental retardation, seizures, learning disabilities, and other mental diseases can occur as a result of this insufficient nutrient delivery to the fetus. Cell death occurs through overstimulation of excitatory amino acid receptors, calcium influx, and formation of free radicals and inflammatory cytokines. Therapeutic interventions that are efficacious for the injured newborn are limited mainly because the majority of insults (90%) resulting in CP occur *during pregnancy* and current therapies only address those injuries that occur during labor and delivery or after birth, therefore addressing only 10% of the injured newborns.

Natural health products are known to contain metabolites that prevent brain injury following hypoxia/ischemia. Sulforaphane is an isothiocyanate found in vegetables such as broccoli sprouts, brussels sprouts, and cabbage that has anti-inflammatory, anti-oxidant, anti-apoptotic effects. Sulforaphane has demonstrated potential to protect against acute brain injury in cases of stroke and oedema. In addition, it has been shown to exhibit neuroprotective properties in hypoxic-ischemic brain injuries.

Hypothesis Sulforaphane will differentially prevent injury in neuronal cells exposed to oxygen glucose deprivation (OGD).

Methods

To investigate the rescue effects of sulforaphane of neurons exposed to oxygen glucose deprivation (OGD), cortical neurons of P2 Long Evans rats were examined. Verifying the cell cultures of neurons was done by using anti-Neuron Specific Enolase antibody and Western Blots. Then to determine the optimal OGD time to achieve LD50, the neurons were cultured for 7 days and exposed to 1, 2, 4, 6 hours of OGD at 5% oxygen, 5% carbon dioxide, and 90% nitrogen in glucose free media. OGD was followed by reoxygenation for 24, 48, and 72 hours at 5% carbon dioxide and 95% air. Using Trypan Blue, the percentage of cell death was determined. For determine the neuroprotective effects of sulforaphane, 0.5, 1, 2, 2.5, or 5µmol/L of sulforaphane was added to the culture during OGD. Then it was replaced with normal growth media. Using Trypan Blue staining, cell death was determined.

Results

LD50 was achieved with 1 hour of OGD then 24 hours of reoxygenation. 1µmol/L of SFN decreased cell death compared to the control from 54.12% to 24.82%

Conclusions

Our results indicate:

- Increasing OGD time increases neuronal death
- Increasing reoxygenation time increases neuronal death
- Minimal time for LD50 is 1 hour of OGD with 24 hours of reoxygenation
- All concentrations of sulforaphane decreased cell death compared to the control
- 1µmol/L of sulforaphane decreased cell death the most

Abstract #: 114
 Presenter: Jamie Zagozewski
 Supervisor: David Eisenstat
 Title: Dlx homeobox genes and epigenetic regulation of retinal cell fate
 Authors: Jamie Zagozewski, David Eisenstat
 Affiliations: U of A

Introduction

Retinoblastoma is the most common childhood eye cancer, however, the cell of origin of this disease is currently unknown. Understanding retinal cell fate regulation is critical towards identifying the retinoblastoma cell of origin. Homeodomain transcription factors play critical roles in retinal development. The role of epigenetics in this process is only beginning to be understood. Our goal is to study Dlx homeobox genes and histone modifications in the regulation of retinal progenitor differentiation. We hypothesize that DLX2 in cooperation with histone modifying proteins promote retinal progenitors to adopt a retinal ganglion cell (RGC) fate while concomitantly repressing photoreceptor (PR) cell fate.

Methods

Chromatin immunoprecipitation (ChIP) was utilized to identify presence of chromatin modifications and DLX2 transcription factor binding to PR and RGC targets in situ. ChIP-reChIP confirms co-localization of DLX2 and chromatin modification in situ. Immunofluorescence analysis of Dlx1/Dlx2 double knockout (DKO) retinal tissue was used to examine changes in both PR and RGC gene expression in the absence of Dlx gene function. Dlx2 gain-of-function was accomplished using in utero retinal electroporation.

Results

H3K27me3 and DLX2 were identified at the promoter of Otx2 in the developing retina in situ. In addition, H3K27me3 was excluded from the promoters of TrkB and Brn3b, which are bound by DLX2 and activated during retinal development in vivo. ChIP-reChIP experiments confirmed co-localization of DLX2 and H3K27me3 at PR specific targets, whereas co-localization was not observed at RGC specific genes. There is increased and ectopic expression of Crx and reduction of Brn3b expression in the developing retina of the DKO mouse. Conversely, Dlx2 gain-of-function demonstrated cells ectopically expressing DLX2 also co-expressed BRN3b, whereas CRX and OTX2 expression was excluded.

Conclusions

Our findings suggest that DLX2 cooperates with epigenetic modifications to promote retinal progenitors to adopt a RGC fate while repressing PR fate. Future directions will include H3K4me3 ChIP to demarcate active promoters. ChIP using Dlx1/Dlx2 DKO embryonic retinas and co-immunoprecipitation experiments with antibodies to components of the chromatin modifying machinery will be carried out to determine whether DLX recruits remodelling complexes to target gene promoters to activate or repress expression of RGC and/or PR-specific markers, respectively. These findings demonstrate a novel cooperation between Dlx homeobox genes and histone modifications as a mechanism for regulating retina cell fate decisions.

Funded by: WCHRI Graduate Studentship

Abstract #: 115
 Presenter: Rui Zheng
 Supervisor: Edmond Lou
 Title: In-Vivo validation of ultrasound and radiograph measurements: a pilot study
 Authors: Rui Zheng, Lawrence Le, Doug Hill, Marc Moreau, James Mahood, Sarah Southon, Douglas Hedden, Edmond Lou
 Affiliations: U of A

Introduction

Scoliosis is a three-dimensional deformity of the spine. It occurs in approximate 3% of adolescent population. The Cobb angle is the gold standard to diagnose and monitor scoliosis and is measured on standing posteroanterior (PA) radiographs. However, the ionizing radiation is a big concern by the patients and families. An in-vitro study from our group has shown ultrasound can image spine and the reason to use ultrasound because it is a radiation-free method. The objective of this preliminary study is to validate the in-vivo measurements from the ultrasound on AIS patients is clinically comparable with radiograph measurements.

Methods

A medical ultrasound system is used to scan patients who meet the following inclusion criteria: 1) diagnose with adolescent idiopathic scoliosis (AIS), 2) the Cobb angle is under 40°, and 3) no surgical treatment before. All participants signed the written consent. A normal standing position is requested during an ultrasound scan. Ultrasound data were exported to a custom developed in-house program. The coronal, sagittal and transverse views were able to display. In this pilot study, only 14 ultrasound images on the coronal plane were measured. The ultrasound measurements were compared to the Cobb angles from the clinical records which were acquired on the same day.

Results

Among 14 AIS patients, 27 out of 29 spinal curves were able to measure from the ultrasound images. The coronal curvature measurement from the ultrasound was ($26.0^{\circ} \pm 10.6^{\circ}$) and the Cobb angle from the clinical records was ($25.1^{\circ} \pm 9.9^{\circ}$). The range of the difference between the ultrasound and the radiographic measurements was 0.3° to 9.1° . The correlation coefficient (r) between the two methods was 0.96.

Conclusions

This pilot study demonstrates the coronal curvature measurement from ultrasound is average 2.6° different from radiographs. A large clinical trial is conducting now to validate the proposed ultrasound method.

Funded by: WCHRI Innovation Grant

Abstract #: 116
 Presenter: Mohamed Elgendi
 Supervisor: Ian Adatia
 Title: Time-domain analysis of heart sounds in children with and without pulmonary artery hypertension
 Authors: Mohamed Elgendi, Prashant Bobhate, Shreepal Jain, Long Guo, Jennifer Rutledge, Yashu Coe, Roger Zemp, Dale Schuurmans, Ian Adatia
 Affiliations: U of A

Introduction

New digital stethoscopes are able to record and transmit an acoustic tracing to a computer that can be further analysed later. We sought to study the acoustic recordings from a digital stethoscope in children undergoing simultaneous catheterization of the pulmonary artery (PA) to determine if the recorded heart sounds would be useful in the diagnosis of pulmonary artery hypertension (PAH).

Methods

Heart sounds were recorded simultaneously with direct PA pressure measurements obtained during PA catheterization. Heart sounds were recorded using a 3MTM LittmannR 3200 digital stethoscope (3M Inc., Denmark), which works in conjunction with Zargis Cardioscan™ software (Zargis Medical Corp., Princeton, NJ, USA) to store recorded heart sounds in *.wav mono audio format. Recordings were obtained over 20 seconds with sampling frequencies of 4000 Hz sequentially at the 2nd left intercostal space (2nd LICS) and the cardiac apex for 20 seconds. We used MATLAB 2010b (The MathWorks, Inc., Natick, MA, USA) for signal analysis and optimization. We annotated the events that represented the first heart sound (S1), 2nd heart sound (S2) and the aortic (A2) and pulmonary (P2) components of the S2. We calculated the power or intensity of the extracted event area. We defined PAH as a mean PA pressure ≥ 25 mmHg and PA wedge pressure >15 mmHg.

Results

We collected recordings from 22 subjects median age 6 years (0.25-19) 9 male, 13 female. Eleven subjects had PAH (mean PA pressure median 55 mmHg (range 25-97) and 11 had normal PA pressures (mean PA pressure median 15 mmHg (range 8-24). We found statistically significant differences in the ratio of intensities of P2/A2 ($p=0.0001$), P2/S2 ($p=0.0001$) between the 2 groups from sounds recorded at both the 2nd left intercostal space (LICS) and the apex. There was a linear correlation ($r > 0.7$) between P2/S2 and mean PA pressure from recordings at the 2nd LICS and the apex. For P2/A2 ratio a linear correlation was only seen in the apical recordings.

Conclusions

The main finding of our investigation is that there is a clear separation between the intensity of P2 and A2 in children with and without PAH in acoustic recordings collected with a hand held digital stethoscope simultaneously with direct PA pressure measurements. The ratio of the intensity of P2/A2 and P2/S2 discriminates between subjects with and without PAH. These findings may be of value in the development of an acoustic device to diagnose PAH.

Funded by: WCHRI Innovation Grant, Alberta Innovates Centre for Machine Learning and Cardiovascular Medical Education





Abstract #: 117
 Presenter: Vishaal Rajani
 Supervisor: Gregory Funk
 Title: Endogenous activation of P2Y1 receptors in the preBötzing complex in vivo attenuates the secondary hypoxic respiratory depression
 Authors: Vishaal Rajani, Nathan Chu, Jennifer Zwicker, Silvia Pagliardini, Nephtali Marina, Sergey Kasparov, Alexander Gourine, Gregory Funk
 Affiliations: U of A

Introduction

The ventilatory response to hypoxia comprises an initial increase in ventilation followed by a secondary depression that can be life-threatening in premature infants. The mechanisms underlying the kinetics and magnitude of this secondary depression are not known, but ATP released within the ventrolateral medulla acts via purinergic (P2) receptors (R) to attenuate this depression. We explored the hypothesis developed from analysis of the rhythmic medullary slice preparation that ATP acts via P2Y1Rs in the preBötzing Complex (preBötC), a critical site for inspiratory rhythm generation, to mediate this attenuation. We also characterize the signaling pathways underlying the P2Y1R excitation in vitro.

Methods

Adult, urethane-anesthetized, paralyzed, ventilated and vagotomized rats were exposed to 10% O₂ (90% N₂) for 5 min immediately following local unilateral injection of vehicle (0.2µl HEPES buffer) or 500µM MRS2279 (0.2µl, P2Y1 receptor antagonist) into the preBötC. Integrated phrenic nerve activity (IPN) was monitored as an index of respiratory activity. To characterize signaling pathways in vitro, we assessed the bursting frequency of the rhythmic brain slice preparation from neonatal rats during the addition of 100µM MRS2365 (P2Y1R agonist) locally to the preBötC before and after adding inhibitors for phospholipase C (PLC), intracellular calcium (Ca²⁺), inositol triphosphate (IP₃) receptors and protein kinase C (PKC).

Results

In response to hypoxia in vivo, the control group showed initial increases of 40±9% and 60±10% in respiratory frequency (fr), and estimated ventilatory output (VE; fr x amplitude of IPN), respectively. The hypoxia-evoked initial increase in ventilation was similar in the MRS2279 group. The secondary depression, however, was significantly greater in the MRS2279 group. In the control group, fr fell to 93±9% of baseline whereas VE remained 17±12% above baseline. In the MRS2279 group, fr and VE fell to 54±14% and 62±17% of baseline, respectively. In the rhythmic slice, blockers for PLC, Ca²⁺, and IP₃ all reduced the MRS2365 evoked frequency increase significantly by over 60%. Inhibiting PKC significantly attenuated the response by ~30%.

Conclusions

Data suggest that during hypoxia endogenously-released ATP acts via P2Y1Rs in the preBötC to reduce the magnitude of the secondary hypoxic respiratory depression. The P2Y1R-evoked frequency increase is mediated through the PLC-IP₃ gated release of Ca²⁺ and, in part, via PKC.

Funded by: WCHRI Innovation Grant, Graduate Studentship, Summer Studentship, CIHR, AIHS, CFI, and ALA

Abstract #: 118
 Presenter: Schammim Ray Amith
 Supervisor: Larry Fliegel
 Title: Inhibition of the Na⁺/H⁺ exchanger (NHE1) increases susceptibility to paclitaxel in invasive breast cancer cells
 Authors: Schammim Ray Amith, Jodi Wilkinson, Larry Fliegel
 Affiliations: U of A

Introduction

The pH gradient in normal cells is tightly controlled by the activity of pH regulatory proteins including the Na⁺/H⁺ exchanger, NHE1. NHE1 becomes constitutively active in a neoplastic milieu, dysregulating pH homeostasis and causing cells to become tumorigenic. In breast cancer cells, NHE1 hyperactivity results in an acidic tumor microenvironment that facilitates aggressive cellular proliferation, migration, and invasion leading to tumor metastasis. The pathophysiological role of NHE1 in tumor progression with regards to ion flux is well known, however, the manipulation of pH in and around tumor cells has only recently been considered as a strategy in augmenting cancer therapy.

Methods

We studied the effect of NHE1 inhibitors EMD87580 and HMA, either alone or in combination with paclitaxel, a leading chemotherapeutic drug, on NHE1 exchanger activity, cell viability, proliferation, migration, and invasive potential in a breast cancer cell line, MDA MB 231.

Results

We found that cells treated with EMD or HMA in combination with paclitaxel were more susceptible to cell death, and had significantly reduced rates of migration and invasion, than cells treated with paclitaxel or inhibitors alone. To highlight the importance of NHE1 function, we generated an MDA-MB-231NHE1- knockout cell line for comparison with the wild-type cells that endogenously express NHE1. The NHE1 knockout cell line showed no demonstrable Na⁺/H⁺ exchange activity, and much lower rates of proliferation, migration and invasion compared to wild-type cells. Our results demonstrate, for the first time, that inhibition of NHE1 increases the susceptibility of invasive breast cancer cells to paclitaxel.

Conclusions

Since pH regulation appears to play an integral role in the switch from a normal to a neoplastic microenvironment, these data lend further credence to the importance of NHE1 as a potential target in breast cancer chemotherapy.

Funded by: WCHRI Trainee Travel Grant, Canadian Breast Cancer Foundation

Abstract #: 119
 Presenter: Matthew Benesch
 Supervisor: David Brindley
 Title: Inhibition of autotaxin delays the initial phase of breast tumor progression in an orthotopic mouse model
 Authors: Matthew Benesch, Xiaoyun Tang, Bernard Kok, Jay Dewald, Todd McMullen, David Brindley
 Affiliations: U of A

Introduction

Breast cancer is the most common malignancy among women and one-third of these women die from metastasis. Current breast cancer treatments often fail because of the development of resistance to chemotherapy and radiotherapy. We propose that lysophosphatidate contributes significantly to these problems. Lysophosphatidate is produced from circulating lysophosphatidylcholine by the secreted enzyme autotaxin. Lysophosphatidate signals through six receptors to promote tissue remodeling and wound repair. This regulation becomes dysfunctional in many cancers and stimulates tumor progression, metastasis and resistance to chemotherapy and radiotherapy. It is also unclear whether autotaxin is produced by tumor cells or cells in the tumor microenvironment. Signaling by lysophosphatidate has received little attention compared to that of estrogens and EGF in treating breast cancer. There are no current therapies targeting lysophosphatidate signaling. We hypothesize that blocking autotaxin activity and lysophosphatidate signaling should provide new cancer treatments.

Methods

We evaluated the efficacy of ONO-001 (an oral ATX inhibitor from Ono Pharmaceuticals) in a mouse syngeneic breast cancer model. We injected 8-10 week-old female Balb/c mice in the orthotopic breast fat pad with 20,000 4T1 Balb/c breast cancer cells. Mice were gavaged daily with vehicle or 10 mg/kg/day ONO-001. Autotaxin activity was assayed in plasma, breast pads and tumors and autotaxin expression was monitored by qRT-PCR and immunohistochemistry. Molecular species of lysophosphatidate were measured by mass spectrometry. Tumor development was measured daily with calipers.

Results

Circulating ATX activity was decreased by >50% after 24 h from last ONO-001 treatment. ONO-001 also produced a sustained decrease in the plasma concentrations of lysophosphatidate, especially in unsaturated species. Tumor growth was about 2.2-fold lower up to day 11 in mice treated with ONO-001. Lung metastasis at day 21 was decreased by >60%. Almost all autotaxin in the tumor and its microenvironment came from the mammary fat pad and this was increased during tumor progression. Plasma ATX activity increased with metastatic disease and ONO-001 was able to suppress it.

Conclusions

This study demonstrates for the first time that an autotaxin inhibitor can decrease breast tumor progression and metastasis. The work also establishes the importance of the tumor microenvironment in producing autotaxin, which promotes cancer progression. Our work represents a paradigm shift in understanding how decreasing lysophosphatidate-mediated signaling can be used to block tumor progression, metastasis and the development of treatment resistance. We now hope to test an autotaxin inhibitor in a clinical trial.

Funded by: WCHRI Innovation Grant, CIHR, CBCF, Ono Pharmaceuticals Ltd., Killam Trusts, AIHS, Vanier Canada Graduate Scholarships

Abstract #: 120
 Presenter: Dev Dutta
 Supervisor: Catherine Field
 Title: Docosahexaenoic acid (DHA) supplementation reduces human breast cancer tumour growth in Nu/Nu Mice
 Authors: Dev Dutta, Marnie Newell, Catherine Field
 Affiliations: U of A

Introduction

In Alberta an estimated of 21,000 women will be diagnosed and 400 will die from breast cancer in 2013. Clearly further advances in scientific knowledge and research are needed to improve treatment methods and extend the lives of women afflicted with this disease. The purpose of our study was to determine the effect of treating breast cancer with the polyunsaturated fatty acid, docosahexanoic acid (DHA). Our study utilizes MDA-MB-231, an estrogen independent human breast cancer tumour that we implanted in immunodeficient nu/nu mice.

Methods

After allowing the tumour to grow for three weeks mice were randomized to one of two semi-purified nutritionally adequate diets; either supplemented with 5% of the fat as the omega-3 fatty acid (DHA) or maintained on the same diet without DHA (control). At the end of 3 weeks, the mice were killed and tumours were collected and size, weight, and immunological assays performed.

Results

Tumors from mice fed DHA were significantly ($P < 0.05$) smaller (66.6% of the control) compared to tumours from mice fed the control diet. Consistent with this, using Western Blotting analysis, we found a higher ($P < 0.05$) cell death signaling protein expression in the tumours from the DHA fed mice: CD95 (143% of the control), FADD (182% of the control), and EGFR (185% of the control).

Conclusions

These findings are consistent with in vitro work from our lab and confirm that feeding DHA promoted changes in the tumours consistent with upregulating apoptotic death pathways. In conclusion, our work suggests that treating nu/nu mice with human breast cancer tumours with a diet high in DHA, decreased tumour size and increased proteins associated with apoptosis. Our research suggests that this dietary fatty acid may be useful in the treatment of this aggressive type of cell line that affects 30% of women diagnosed with this disease.





Abstract #: 121
 Presenter: Hilary Fast
 Supervisor: Sue Ross
 Title: Study of menopause symptoms, health complications, and treatment progressions in women cared for at a specialized menopause clinic: preliminary chart review
 Authors: Beate Sydora, Nese Yuksel, Lori Battochio, Tami Shandro, Sue Ross
 Affiliations: U of A

Introduction

Menopause symptoms can significantly impact a woman's quality of life. For severe cases, specialized menopause clinics offer patient centered treatment options and involve several health care professionals. Clinical care recorded on patient charts at the Lois Hole Hospital menopause clinic includes the Menopause Clinic Health Profile (MCHP) form. We have recently established the Menopause Outcomes Research & Education group to investigate symptoms and treatment. Our goal was to examine a sample of charts to investigate the usefulness of such charts in exploring questions about the most common concerns and other medical problems at presentation, treatments offered, symptom changes over time and whether subsets of women could be identified that benefited from certain treatments.

Methods

This study was a preliminary scan of a convenience sample of 20 charts. Data extracted included demographics, menopausal stage, symptoms and other medical problems and medications at initial consult, treatments recommended and change in symptoms over time as recorded in follow-up MCHP forms. Data were entered into Excel for simple descriptive analysis.

Results

At initial consult, 70% of the MCHP forms were filled out completely or had one missing value. Demographic information indicated that 25% of the women were perimenopausal and 75% were post-menopausal, with 15% experiencing surgical menopause. The mean age was 50 years (range of 42-58) with an average BMI of 29.5 (range of 23.8-42.6). The most common concerns at presentation were sleep dysfunction (50%), vasomotor symptoms (35%), seeking information about hormone therapy (30%), mood symptoms (30%) and weight gain/bloating (30%), with 85% of women having 3 or more concerns. Treatments offered included hormone therapy, vitamin supplements and changes to diet and exercise with 75% of women attending a follow-up visit.

Conclusions

Our data indicated that the charts were sufficiently informative to provide an assessment of the complex care given in the menopause clinic and are useful for the development of future prospective studies.

Funded by: WCHRI Cavarzan Chair endowment, RAH Foundation, Lois Hole Hospital

Abstract #: 122
 Presenter: Katie Kinaschuk
 Supervisor: Denise Hemmings
 Title: High fructose levels increase uric acid production and ICAM-1 expression in trophoblasts
 Authors: Katie Kinaschuk, Martina Mackova, Doaa Dahlawi, Rhonda Bell, Denise Hemmings
 Affiliations: U of A

Introduction

Poor pre and postnatal conditions, including maternal health, negatively affect fetal development and maternal and fetal health later in life. Maternal health includes factors such as exercise, substance use, environmental factors, chronic conditions and diet. Fructose in the North American diet has rapidly increased over 600% between 1976-2005. High fructose consumption increases uric acid (UA) levels and is linked to various pathologies. Though UA is an antioxidant at normal concentrations, hyperuricemia is implicated in pregnancy-related disorders such as preeclampsia. Hyperuricemia increases expression of ICAM-1, an inflammatory marker that is typically seen in preeclamptic placentae. However, the link between high fructose intake, UA levels and ICAM-1 expression in the placenta has not been investigated. We hypothesize that high dietary fructose induces inflammation by increasing UA, leading to elevated ICAM-1 expression in the placenta.

Methods

To evaluate this, we first cultured isolated primary human cytotrophoblast cells from normal term placentae with and without fructose (0-1%). Qualitative assessment by immunofluorescence showed increased uric acid and ICAM-1 expression in treated vs. control cultures. In a second approach, a random cross-over pilot study of healthy, non-pregnant women was conducted to determine if UA and fructose levels in the urine, corrected for creatinine, would correlate to fructose intake. Women were randomly assigned to consume a common breakfast with either water or orange juice as the source of fructose. They had the other breakfast on a subsequent day.

Results

Although no overall correlation between fructose and UA urine levels was established in this small cohort, increased UA levels were found in urine obtained after high fructose compared to low fructose breakfasts. These promising data will be used to plan a study in pregnant women.

Conclusions

Identifying a relationship between fructose, UA and placental inflammation is important to develop public health education initiatives to reduce fructose intake, particularly in pregnant women.

Funded by: CIHR and WCHRI Bridge Funding

Abstract #: 123
 Presenter: Erin Lewis
 Supervisor: Catherine Field
 Title: Pregnant and lactating women in Alberta are not meeting daily dietary recommendations for choline
 Authors: Erin Lewis, Fatheema Subhan, Rhonda Bell, Linda McCargar, Jonathan Curtis, Rene Jacobs, Catherine Field
 Affiliations: U of A

Introduction

Choline requirements increase during pregnancy and lactation to meet the high developmental needs by many tissues of the fetus and infant. Despite dietary recommendations for higher choline intakes during pregnancy and lactation, there is limited research regarding maternal intake during these important periods. We estimated dietary choline intake in a population of Albertan women during pregnancy and lactation, and the contribution of egg and milk consumption to actual and recommended daily intakes.

Methods

Dietary intake data was collected from the first 600 women enrolled the Alberta Pregnancy Outcomes and Nutrition (APrON) study. Twenty-four hour dietary intake recalls were conducted in a face-to-face interview in the first and/or second trimester (depending on time of study enrollment), third trimester and 3-months postpartum. In addition, a food frequency questionnaire (FFQ) was collected to examine habitual dietary intake for the 12-months prior to pregnancy. A database was constructed to include foods consumed by the cohort and used to estimate dietary choline intake at each time point.

Results

Mean total choline intake during pregnancy was 347 ± 149 mg/day with 23% of participants meeting the Adequate Intake (AI) for pregnancy. During lactation period (3-months postpartum), mean total choline intake was 346 ± 151 mg/day with 10% of participants meeting the AI. Phosphatidylcholine was the form of choline consumed in the highest proportion, making up $48 \pm 2\%$ of total choline consumed during pregnancy and lactation. Main dietary sources were dairy, eggs and meat. Women who consumed at least one egg (as a single food item) in a 24-h recall period had higher ($P < 0.001$) total choline intake and were more likely to meet daily choline recommendations compared to women who did not consume eggs ($P < 0.05$). Similarly, when any amount of milk was consumed, women had higher ($P < 0.05$) choline intake and were more likely to meet daily choline recommendations ($P < 0.05$) compared to women who consumed no milk.

Conclusions

Choline intake may be suboptimal in well-nourished pregnant and lactating women in Alberta. The promotion of both egg and milk consumption may assist in improving choline intake and meeting daily recommendations..

Funded by: WCHRI Graduate Studentship|Trainee Travel Grant, AIHSLivestock and Meat Agency/ Egg Farmers of Alberta and the Dairy Farmers of Canada

Abstract #: 124
 Presenter: Nadia Moledina
 Supervisor: Suzanne Tough
 Title: Maternal pre-pregnancy BMI and complications of pregnancy
 Authors: Nadia Moledina, Angela Vinturache, Muci Wu, Suzanne Tough
 Affiliations: U of A

Introduction

To investigate the effect of pre-pregnancy body mass index (BMI) on pregnancy complications in a Canadian population.

Methods

Our study was a component of a larger study, the All Our Babies (AOB) study: a prospective, community-based cohort of approximately 3300 women from Calgary, Alberta recruited in the first trimester of pregnancy. Maternal self-reported data on height and pre-pregnancy body weight were linked to clinical data on pregnancy and birth events retrieved from the electronic health records from the Alberta Perinatal Health Program (APHP). Exclusion criteria were: preterm delivery, multiples, non-cephalic presentation, elective C-section, BMI < 18.5 and missing data. 1996 women were included in the study. Descriptive statistics and chi square analysis were used to assess associations between pre-pregnancy BMI and pregnancy complications stratified by BMI categories (Institute of Medicine 1990).

Results

Of the 1996 women included in the study, 1313 were of normal weight (65.8%), 472 (23.6%) were overweight, and 211 (10.6%) were obese. The majority of the sample was younger than 35 years of age (78.3%), Caucasian (79.7%) and reported an annual household income of at least \$80,000 Canadian dollars (72.5%). Compared to women with normal pre-pregnancy weight, overweight and obese women were more likely to develop gestational diabetes (overweight 5.7%, obese 10.9%, $p < 0.001$) and hypertensive disorders of pregnancy: pregnancy induced hypertension (overweight 10.4%, obese 15.6%, $p < 0.001$), preeclampsia (overweight 10.2%, obese 16.6%, $p < 0.001$) and eclampsia (overweight 0.6%, obese 2.4%, $p < 0.001$). There were no differences between normal weight, overweight and obese women with regard to incidence of placenta praevia, intrauterine growth restriction, chorioamnionitis, premature rupture of membranes, fever or vaginal bleeding in labour.

Conclusions

Overweight and obese women are at increased risk of adverse pregnancy outcomes. These findings underline the importance of routine BMI recordings on perinatal records for tailored maternal care during pregnancy and at delivery.





Abstract #: 125
 Presenter: Jane Schulz
 Supervisor:
 Title: TVT Secur versus TVT vaginal tape devices for stress urinary incontinence: a randomized trial
 Authors: Jane Schulz, Selphee Tang, Magnus Murphy, Jose Goncalves, Stephen Kaye, Magali Robert, Sue Ross
 Affiliations: U of A and AHS

Introduction

In 2006, Ethicon introduced Gynecare TVT Secur®, describing this new device as "a breakthrough in minimally invasive SUI technology", stating that it was less invasive, requiring less dissection and anesthesia, and resulting in less postoperative pain. Evidence of efficacy and safety was based on long-term follow-up of patients who had a traditional tension-free vaginal tape (TVT). We set out to compare the effectiveness of the TVT Secur tape device versus traditional TVT for surgical management of stress urinary incontinence (SUI) at 12 months postoperatively, with the primary outcome being objective cure measured using a pad test.

Methods

In four participating centers, women with SUI were randomly allocated to surgery using either single incision or TVT. Primary outcome at 12 months postoperatively was objective evidence of "cure" defined as less than 1g urine leaked during a standardized pad test. Other outcomes included complications, and incontinence-related quality of life. Primary analysis compared the proportion of patients in each group who were cured. The sample size estimate was 300, but the trial stopped early because of poor recruitment. Reporting follows the recommendations of the CONSORT statement.

Results

74 women participated (40 allocated to single incision, 34 to TVT). At 12 months postoperatively, 27/33(82%) of the single incision group were cured, compared with 25/28(89%) of the TVT group (relative risk 0.92, 95% confidence interval 0.75 to 1.13, $p=0.49$). Most women reported little or no SUI symptoms (35/37(95%) vs 29/30(94%), $p > 0.999$). Quality of life improved significantly from baseline for both groups (IIQ-7 mean change -25 for both groups) but the change did not differ between groups ($p=0.880$).

Conclusions

Our study differs from other randomized trials of this single incision tape device in finding the outcome was not significantly worse than the more traditional tape procedure. Although the small sample size means we cannot rule out a real difference, we hypothesize that our successful outcome was due to careful surgical training, emphasising physiologic tensioning of the tape.

Funded by: WCHRI grant for research nurse support

Abstract #: 126
 Presenter: Xiaoyun Tang
 Supervisor: David Brindley
 Title: Lipid phosphate phosphatase-1 inhibits breast cancer progression
 Authors: Xiaoyun Tang, Matthew Benesch, David Brindley
 Affiliations: U of A

Introduction

Breast cancer is the most common malignancy in women. Targeting estrogen and Human Epidermal Growth Factor Receptor 2 (HER2) receptors as adjuvant therapy has improved survival rates. However, recurrence and metastasis are still major causes of death, especially for patients with estrogen receptor and HER2 negative tumors. Increasing evidence indicates that two bioactive lipid phosphates, lysophosphatidate (LPA) and sphingosine-1-phosphate (S1P), play important roles in breast cancer development. LPA and S1P are produced by autotoxin and sphingosine kinase-1, respectively. They act as proliferative, survival and angiogenic factors through their G-protein coupled receptors. Human breast tumors show increased expression of sphingosine kinase-1, autotaxin and LPA receptors, which is associated with poor patient outcomes and resistance to treatments. Conversely, lipid phosphate phosphatase 1 (LPP1) expression is significantly lower in breast tumors compared to noncancerous tissue. LPP1 degrades extracellular LPA, S1P and other bioactive lipid phosphates that are produced in cells.

Methods

Human MDA-MB-231 and mouse 4T1-12B breast cancer cells were transduced with lentivirus that encoded a doxycycline-inducible promoter, which can express wild-type LPP1 or its catalytically inactive mutant, LPP1(R217K). Cell migration was measured with a 96-well Boyden chamber. 4T1-12B cells expressing wild-type and mutant LPP1 were injected into the mammary fat pad of BALB/c mice to establish a syngeneic breast cancer model. Doxycycline (2mg/ml) was added in drinking water to maintain LPP1 expression. Tumor growth was measured with calipers.

Results

Overexpressing wild-type LPP1 in MDA-MB 231 cells increased LPA degradation. The colony sizes of cells in Matrigel 3D cultures were smaller when wild-type LPP1 was expressed compared to LPP1(R217K). LPA-induced migration of MDA-MB-231 cells was attenuated by wild-type, but not mutant LPP1. Wild-type and mutant LPP1 had no effect on EGF-induced cell migration. Breast tumor growth in mice was inhibited by >80% when wild-type LPP1, but not LPP1(R217K), was expressed in the tumor cells. We are now determining the effects on tumor metastasis.

Conclusions

LPP1 increases LPA breakdown and attenuates breast cancer cell migration and growth. Catalytic activity is required for LPP1 to inhibit breast tumor progression in vivo.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 127
 Presenter: Ganesh Venkatraman
 Supervisor: David Brindley
 Title: Lysophosphatidate induces multi-drug resistance transporter expression and chemoresistance in breast cancer cells
 Authors: Ganesh Venkatraman, Matthew Benesch, Xiaoyun Tang, David Brindley
 Affiliations: U of A

Introduction

Lysophosphatidate is produced by the secreted enzyme, autotaxin, from the abundant lysophosphatidylcholine in blood. Increased LPA accumulation in tumors is strongly associated with tumor progression, aggressiveness, metastasis, angiogenesis and chemoresistance. Resistance to chemotherapies is frequently associated with increased expression of members of the ABC family of multi-drug resistance transporters (P-glycoprotein/ABCB1, MRP1 (Multidrug resistance protein)/ABCC1, BCRP (breast cancer resistance protein)/ABCG2). ABCC1 and ABCG2 are widely expressed in several cancer cells. They play an important role in excreting xenobiotics, which include commonly used chemotherapeutics and their toxic by-products. Additionally, ABCC1 and ABCG2 secrete a survival factor called sphingosine 1-phosphate that contributes to chemoresistance and tumor growth. Studies so far have focussed on inhibiting these transporters to overcome drug resistance, but very little about the regulation of their expression. Hypothesis: We hypothesized that part of the effects of lysophosphatidate in producing chemo-resistance involves increased expression of ABCC1 and ABCG2.

Methods

The effects of lysophosphatidate were determined human breast cancer cell lines and equivalent drug-resistant cells.

Results

Lysophosphatidate protected breast cancer cells from doxorubicin and etoposide-induced cell death. Lysophosphatidate increased the expressions of ABCC1 and ABCG2 in several breast cancer cell lines through stimulation of lysophosphatidate receptors-1 and-2. This stimulation increases the production of mRNA for ABCC1 and ABCG2, which involves activation of the transcription factor, Nrf2 (nuclear factor, erythroid-like 2). The increased expression of ABCC1 and ABCG2 is reflected in the increased capacity to export sphingosine 1-phosphate and several chemotherapeutic drugs. We will now test if blocking LPA signaling in a mouse model of breast cancer decreases Nrf2 activation, multi-drug transporter expression and sphingosine 1-phosphate secretion.

Conclusions

Lysophosphatidate increases the expression of ABCC1 and ABCG2 in several breast cancer cell lines to facilitate the export of several chemotherapeutic drugs and their toxic metabolites. Lysophosphatidate also increased the secretion of S1P as a survival and angiogenic factor. The actions contribute to the development of chemo-resistance and to increased tumor progression and metastasis. Our discovery that lysophosphatidate signaling in tumors increases ABCC1 and ABCG2 expression provides a novel mechanism for production of chemoresistance. Other work in our group demonstrates that blocking lysophosphatidate production with an autotaxin inhibitor decreases breast tumor development. We proposed that using autotaxin inhibitors in cancer patients should also decrease the development of resistance to existing chemotherapies and thus improve patient care.

Funded by: WCHRI Graduate Studentship|Trainee Travel Grant

Abstract #: 128
 Presenter: Nubia Zepeda
 Supervisor: YangXin Fu
 Title: Examining the effect of RUNX3 in ovarian cancer chemoresistance
 Authors: Nubia Zepeda, Zhihua Xu, Christine Yang, Helen Steed, YangXin Fu
 Affiliations: U of A

Introduction

Ovarian cancer is the leading cause of death from gynecologic malignancies in the U.S. Diagnosis at advanced stages, combined with ineffective current therapies to induce a cure contribute to the recurrence and chemoresistance displayed by the disease. Platinum-based compounds are used to treat ovarian cancer. However, cancer cells can become platinum resistant and current chemotherapy regimens are ineffective against platinum-resistant ovarian cancers. RUNX3 is a member of the RUNX family of transcription factors and has been shown to act as a tumor suppressor or an oncogene in a tissue specific manner. In ovarian cancer, RUNX3 is thought to play an oncogenic role by promoting cell growth, however whether RUNX3 plays a role in chemoresistance of ovarian cancer is unknown. In this study, we aim to investigate the role of RUNX3 in chemoresistance of ovarian cancer.

Methods

RUNX3 expression in established human epithelial ovarian cancer (EOC) cell lines (OVCAR3, SKOV3, A2780S and A2780CP), primary human ovarian surface epithelial (OSE) cells and primary EOC cells was examined by Western blotting. Primary human OSE cells were isolated from ovaries surgically removed due to benign gynecologic diseases. Primary EOC cells were isolated from ovarian cancer patient's ascites.

Results

Our Western blotting results showed that RUNX3 was expressed in 6 out of 10 primary EOC cell cultures, but in none of the OSE cell cultures. In the established EOC cell lines, variable expression of RUNX3 was observed. SKOV3, OVCAR3 and A2780S cells showed low levels of RUNX3, while A2780CP cells, a cisplatin-resistant EOC cell line, showed a high level of RUNX3 expression. Subcellular fractionation results showed that RUNX3 was localized to the nucleus of EOC cells. To determine whether RUNX3 expression affects the response of EOC cells to carboplatin (the first-line chemotherapeutic agent used to treat EOC), we stably overexpressed RUNX3 in SKOV3 and A2780S cells and transiently knocked down the expression of RUNX3 in A2780CP cells. Carboplatin-induced cytotoxicity in these cells was determined by the neutral red uptake assay, which showed that knockdown of RUNX3 in A2780CP cells slightly sensitized the cells to the cytotoxic effects of carboplatin, whereas overexpression of RUNX3 in A2780S and SKOV3 cells increased their resistance to the cytotoxic effects of carboplatin.

Conclusions

Our data suggest that RUNX3 may play a role in the chemoresistance of EOC cells.

Funded by: WCHRI Graduate Studentship|Trainee Travel Grant





Abstract #: 129
 Presenter: Nese Yuksel
 Supervisor:
 Title: A content analysis of blogs on bioidentical hormone therapy
 Authors: Nese Yuksel, Arianne Bayot, Ashley Kwan, Linda Nguyen
 Affiliations: U of A

Introduction

It is estimated that 75% of all users search the internet to look for health information. With the recent controversy surrounding the term "bioidentical hormone therapy (BHT)", women may be turning to internet blogs as a source of health information on this topic. The objectives of this study were to analyze the content of the information in BHT blogs and to describe the perspectives on BHT presented in these blogs.

Methods

Blogs were identified using the search engine Google Blog Search[®]. Inclusion criteria included: English language, developed or updated between September, 2011 to August, 2012, and not more than three clicks from the top 200 search results. Video or discussion forum blogs, as well as those requiring password access were excluded. A quantitative content analysis was performed on 105 blogs meeting study criteria. Emerging themes were also identified through thematic analysis. Blogs were analyzed separately by two coders and a third coder noted and resolved any discrepancies among the coders.

Results

The author was indicated in 75% of blogs, with equal representation between male and female. Only 26% of blogs were from health care professionals, however, 68% did not indicate the profession. Promoting a product or service was the predominant purpose of the blogs (65%). Only one blog was from a professional organization. Evidence to support information presented was mentioned in 21% of the blogs, with 12% providing references. Majority of blogs defined BHT as compounded formulations (57%), while only 21% indicated that BHT is also commercially available. Bioidentical hormones were categorized as estradiol (28%), estriol (23%), estrone (12%) and natural progesterone (50%). In addition, testosterone (33%) and dehydroepiandrosterone (DHEA) (15%) were mentioned. Nearly 82% of blogs portrayed BHT positively, while 63% relayed negative perspectives on conventional hormone therapy (CHT). Blogs that mentioned safety claimed that BHT was safer than CHT in regards to breast cancer (30%) and associated cardiovascular risk (22%). General themes used to promote BHT included "hormone balance", "natural", "anti-ageing", and "individualization".

Conclusions

Individuals seeking health information on BHT on the internet may encounter information presented in blogs. Claims made on BHT blogs presented perspectives that were largely commercially based and were not consistent with evidence-based recommendations supported by professional organizations.

Abstract #: 130
 Presenter: Katherine Bannar-Martin
 Supervisor: Lisa Hartling
 Title: A systematic review of the use of narrative storytelling and visual arts-based approaches as knowledge translation tools in healthcare
 Authors: Lauren Albecht, Mandy Archibald, Katherine Bannar-Martin, Pamela Brett-MacLean, Lisa Hartling
 Affiliations: U of A

Introduction

The use of storytelling and arts-based approaches as communication and teaching tools has been gaining appeal in healthcare. Such approaches are powerful, ancient forms of sharing that can engage with multiple audiences to build awareness and foster change. Effective healthcare delivery is dependent on effective approaches to knowledge translation (KT) among different audiences.

Methods

A systematic review of the literature was undertaken to examine how narrative and arts-based KT approaches have previously been used in healthcare. With a healthcare librarian and two independent reviewers, studies were selected and independently screened through two stages. Evidence tables were created to facilitate analysis by study design (quantitative, qualitative, and mixed/multi-methods), intervention type, population demographics, intervention environment (clinic, community, school), and methodological quality.

Results

Results show that current approaches are highly varied and mixed in their efficacy. The majority of narrative and arts-based approaches were through forms of narrative expression (e.g. theatre), while remaining interventions were combined visual and narrative forms of expression (e.g. picture books). The majority of populations to receive arts-based interventions were at-risk, adults, from developed nations, and most studies occurred within a community environment. We identified four outcome measures: knowledge, attitude, behaviour, and clinical. Our findings illustrated that narrative and arts-based interventions worked most effectively on knowledge measures (65% of studies had a positive change in the audience's knowledge). Outcome measures did not vary with study population type, study population demographics, nor intervention environment. Discouragingly, the methodological quality of most studies (71%) was very low, and most studies (65%) did not document ethical approval.

Conclusions

Our review serves as a 'state-of-the-science' of narrative and arts-based approaches to KT. It highlights the merits and limitations of current research on such approaches, and provides practical recommendations for healthcare professionals, policy makers and researchers on the utility of these approaches.

Abstract #: 131
 Presenter: Emily Chan
 Supervisor: Alvaro Osornio-Vargas
 Title: An environmental injustice analysis of carcinogenic emissions in Windsor ON
 Authors: Emily Chan, Daniel O'Brien, Jesus Serrano, Alvaro Osornio-Vargas
 Affiliations: U of A

Introduction

The city of Windsor ON has historically been the subject of numerous research due to decades of transboundary air and water pollution, location beside a major scrap metal plant, and automobile manufacturing.¹ The city has also been referred to as an "area of concern" by Health Canada and has most recently been investigated for links with 26 types of cancers.¹ Thus, we investigated Environmental Injustice (populations with lower socioeconomic status or SES are more likely to be exposed to environmental pollutants than higher SES counterparts) with a focus on known carcinogens emissions for this city.

¹Gilbertson M., Brophy J. Community health profile of Windsor, Ontario, Canada: Anatomy of a Great Lakes Area of Concern. *Environmental Health Perspectives* 109, 827-843 (2001).

Methods

We examined relationships between SES and: 1) proximity from centroids to nearest emitting facilities (km); 2) total carcinogens released from emitting facilities (tonnes and risk score). A Census based SES index was created in house. All variables were analyzed at the dissemination area (DA) level (areas with 400-700 people, n=541). Analyses included Pearson Correlations, scatter plots, box plots, and the division of DAs into quintiles of SES index for comparison by ANOVA and descriptive statistics.

Results

A positive correlation ($r=.459$, $P<0.05$) was found between DAs SES index and distance to nearest emitting facilities. Small negative correlations were seen with SES index and the amount of carcinogenic emissions in tonnes ($r=-.277$, $P<0.05$), as well as the carcinogens expressed as risk scores ($r=-.160$, $P<0.05$). Similarly, the lowest quintile of SES index had a mean distance from emitting facility that was significantly lower than any other quintile (km, $P<0.05$), and contained 81.2% of the total carcinogenic emissions in tonnes, and 50.6% of the carcinogens expressed as risk scores.

Conclusions

Populations in Windsor ON with lower SES are more likely to live in close proximity to chemical emitting facilities, and are at a higher risk of exposure to carcinogenic emissions. Future research should examine Environmental Injustice and cancer prevalence for this population.

Abstract #: 132
 Presenter: Faiqa Fayyaz
 Supervisor: Catherine Field
 Title: Estimation of dietary and supplemental intake of folate, vitamin B12 and B6 in women in Alberta during pregnancy and postpartum
 Authors: Faiqa Fayyaz, Anne Gilbert, Rene Jacobs, Rhonda Bell, Linda McCargar, Deborah O'Connor, Catherine Field
 Affiliations: U of A

Introduction

Women are recommended to consume a folic acid containing prenatal multivitamin preconceptionally. Additionally, in Canada universal folate fortification has improved the folate status of the population. Whether women during pregnancy and lactation are getting enough of vitamin B12 and B6 need to be determined. We examined dietary intake of folate, vitamin B12 and B6 from diet and supplemental sources among women who were enrolled in Alberta Pregnancy Outcomes and Nutrition (APrON) cohort-1 during pregnancy and postpartum. The objectives of this study were (1) to determine the dietary intake of folate, vitamin B12 and B6 from diet and supplements (2) to determine the prevalence of insufficient intake of these vitamins through diet and diet + supplement and (3) to determine the factors associated with the supplemental intake of these nutrients

Methods

First 600 women recruited in APrON were included in this study. The 24-hour recall questionnaires and supplement intake questionnaires were used to collect the information on dietary and supplement intake during each pregnancy visit and postpartum. The dietary information was then entered into food processor version (10.6.0) that helped to calculate the daily intake of nutrients.

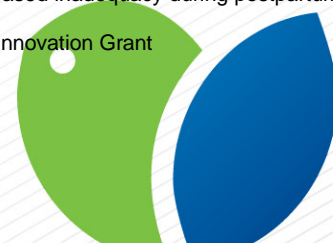
Results

Prevalence of insufficient total food intake (diet and supplement) of folate, vitamin B12 and B6 was very low during pregnancy. However, during postpartum the inadequacy of these vitamins increased. Approximately 90% of the women had folate intake above upper limit of 1000 µg/day during pregnancy. Percentage of women with inadequate intake was as high as 90% for folate, 16% for vitamin B12 and 30% for vitamin B6 during pregnancy through diet alone which declined considerably when supplement intake was combined. Estimated mean intake of these nutrients declined during postpartum. The proportion of the women taking multivitamins contained these nutrients declined significantly during postpartum. The multinomial logistic regression analysis showed that women having a previous pregnancy had increased odds of not using a multivitamin supplement during postpartum.

Conclusions

Inadequate intake of folate, vitamin B12 and B6 is virtually non-existent in pregnant Albertan women. Dietary intake alone appeared to be not enough to fulfill the needs of folate, vitamin B12 and B6. Women's characteristic of having a history of previous pregnancy was associated with abandoning the supplement use which was further associated with increased inadequacy during postpartum.

Funded by: WCHRI Innovation Grant





Abstract #: 133
 Presenter: Muhammad Zafar Hydrie
 Supervisor: Sunita Vohra
 Title: Systematic review of pediatric Type 1 diabetes RCTs
 Authors: Muhammad Zafar Hydrie, Hai Chuan (Carlos) Yu, Namrata Hansraj, Denise Adams, Sunita Vohra
 Affiliations: U of A

Introduction

Many pediatric trials are published each year but criticism has been raised regarding the validity of the outcome measures used and the adequacy of reporting of the outcomes, measurement tools and their psychometric properties. Type I diabetes affects many pediatric patients worldwide and many pediatric Type I diabetes randomized controlled trials (RCTs) have been published. However, the extent of reporting problems in this area has not yet been evaluated.

Purpose: To identify gaps in outcome reporting and heterogeneity of outcomes and outcome measurement tools in pediatric Type I diabetes RCTs and to develop a database of outcome measures for diabetes researchers.

Methods

We searched Medline, Embase, CINAHL, Cochrane Central, and Cochrane SR for pediatric Type I diabetes RCTs. Two independent reviewers screened and extracted data on identified references. Variables extracted included: journal, sample size, participant age, type of study, intervention, control, and details of primary outcome and outcome measurement tools.

Results

While searches identified 8350 unique references, only 164 papers were included. Participant age ranged from 1-20 years. Of the included trials, 32% were of insulin based interventions, 10% of diet-based treatments, 18% of education-based interventions approximately one third of trials did not identify a primary outcome. Of those that did, 62 trials (38%) reported at least one primary outcome and of these, 76% described one outcome as primary and 24% identified more than one. Of the 164 included trials, 74 (46%) failed to address safety or harms of their intervention of interest.

Conclusions

This project has identified gaps in the quality of outcome reporting in pediatric Type 1 diabetes trials published over the past 10 years, leading to recommendations for improvements in reporting standards.

Funded by: WCHRI, CIHR, AIHS

Abstract #: 134
 Presenter: Tristan Robinson
 Supervisor: Rebecca Gokiart
 Title: Developing a knowledge translation strategy for sharing results with First Nation communities
 Authors: T. Robinson, R. Gokiart
 Affiliations: U of A

Introduction

Researchers and First Nation communities have had a tenuous relationship around research knowledge translation leaving many First Nation communities feeling that their knowledge was being taken and misrepresented with little benefit to their communities. A community-based research (CBR) partnership was formed between the U of A and four First Nation communities to identify and incorporate each community's strengths, language and cultural values into understanding what is healthy early childhood development. The purpose was to use this knowledge to develop a supplement to the Early Development Instrument (EDI; Janus & Offord, 2007), a population-based tool for measuring kindergarten aged children's development. Each community participated, over two years, in gathering data through focus groups, the EDI, and the newly created supplements that both parents and teachers completed. The data has been collected and analyzed and the project is in its final phase of sharing the information back to the communities through research committees (CRC) and community action planning. A WCHRI summer student supported the development of a knowledge translation strategy and tools that are culturally relevant, to be used to present findings back to communities.

Methods

The First Nation Child Development (FNCD) project used a CBR approach to conduct 12 qualitative focus groups with over 100 youth, adult and Elder participants, and gather EDI data from 214 children over two years. The focus group data was analyzed and the themes that emerged were used to develop two supplements to the EDI, which were completed by parents and teachers.

Results

An Elder metaphor about the growth of a child as synonymous with the growth of a flower was used to present qualitative data back to the community. At the same time data from the EDI and FNCD teacher and parent questionnaires were also presented across three thematic areas: (1) relationships, (2) language, learning and culture, and (3) a healthy lifestyle and environment. These were all considered critically important to the health and development of children.

Conclusions

The findings shared back with the CRC was accomplished utilizing visual representation of the data, and community members' voices alongside the data from the EDI and FNCD questionnaires. This was critically important to provide context to the data, engage in a dialogue with community members about existing strengths for supporting young children, and areas of focus for the future.

Funded by: WCHRI Science Shop Summer Studentship

Abstract #: 135
 Presenter: Lola Baydala
 Supervisor:
 Title: Substance abuse prevention in the Maskwacis Four Nations: a community-based participatory research partnership
 Authors: Lola Baydala, Natasha Rabbit, Melissa Tremblay, Jennilee Louis, Roxane Peigan, Molly Potts, Kisikaw Ksay-yin
 Affiliations: U of A

Introduction

In response to high rates of substance abuse in their community, members of the Maskwacis First Nations invited U of A researchers to partner with them to culturally adapt, implement, and evaluate an evidence-based substance abuse and violence prevention program, the Botvin Life Skills Training program. With funding from Alberta Health Services, the culturally adapted Maskwacis Life Skills Training (MLST) program was implemented in Maskwacis community schools for three years. This project used a community-based participatory research (CBPR) approach, which emphasized collaboration, co-learning, and equitable involvement of all partners during each stage of the research process (Minkler & Wallerstein, 2003).

Methods

A mixed method approach that honored both Western and Indigenous research orientations was used to evaluate the effectiveness of the MLST program. Outcome Mapping (Earl, Carden, & Smutylo, 2001), a participatory evaluation tool, documented changes in behaviors, relationships, actions, and activities of program stakeholders. Pre- and post-program questionnaires were distributed to MLST students to evaluate learning of program content, and focus groups were conducted with school personnel, Elders, program facilitators, and MLST students to obtain community feedback on the program.

Results

Outcome Mapping documented how the process of culturally adapting, implementing, and evaluating the prevention program (1) acted as a catalyst for community development, and (2) built community and academic capacity to facilitate and support community change. Pre- and post-program questionnaires showed significant improvements in student knowledge, skills, and attitudes related to substance use, and focus groups captured increasing community support for the program and the critical importance of the program's cultural content. Focus group participants agreed that the program's success could be largely attributed to its emphasis on cultural teachings and language.

Conclusions

The process of forming and maintaining a community-university partnership, as well as culturally adapting, implementing, and evaluating the effectiveness of an evidence based substance use and violence prevention program has led to meaningful individual and community change in the Maskwacis First Nations. This presentation will discuss findings from the perspectives of both community and university partners.

Abstract #: 136
 Presenter: Yong Zhang
 Supervisor: Gregory Funk
 Title: The secondary anoxic depression of inspiratory activity in the rhythmic medullary slice is attenuated by endogenous ATP, possibly via astrocyte-mediated, glutamatergic excitation of inspiratory neurons
 Authors: Yong Zhang, Alexander Gourine, Sergey Kasparov, Tucaaeu Alvares, Gregory Funk
 Affiliations: U of A

Introduction

The ventilatory response to hypoxia comprises an initial increase in ventilation followed by a secondary depression that can be life-threatening in premature mammals. ATP released within the ventral respiratory column, including the preBötzing Complex (preBötC, critical site for inspiratory rhythm generation), during hypoxia appears to attenuate this depression through unknown mechanisms. Our hypothesis is that during hypoxia, ATP is released in the preBötC where it acts on both neurons and glia to increase inspiratory frequency (freq). To further explore this hypothesis, we i) assessed whether ATP contributes to the biphasic ventilatory response evoked by anoxia in the isolated medullary slice preparation; and, ii) tested whether the excitation of preBötC inspiratory neurons by ATP involves an astrocyte-mediated glutamate component.

Methods

To address the first objective, we perfused medullary slice preparations from neonatal rats (P0-3) for 3 min with anoxic solution (bubbled with 5%CO₂/95% N₂) and monitored inspiratory freq under control conditions and after bath application of the P₂ receptor antagonists PPADs (50 μM) and Suramin (100 μM) as well as Suramin (100 μM) alone.

To address the second objective, we obtained whole-cell recordings from inspiratory preBötC neurons in vitro. TTX (1 μM) was applied and the response to local application of the P₂Y₁R agonist, MRS2365 (100 μM), was measured repeatedly (time control), or before and after bath application of the glutamate receptor antagonists CNQX (10 μM) and AP5 (100 μM).

Results

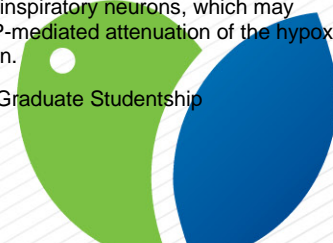
Anoxia evoked consistent, repeatable biphasic responses comprising an initial increase that peaked within the first min at 212±44% of baseline, and a secondary depression that fell to 46±6% of baseline. Following bath application of P₂ receptor antagonist(s), the depression was significantly enhanced; freq fell to 21±3% of baseline (n=6, p<0.01) in PPADs/Suramin group and to 33±4% (n=10, p=0.07. p<0.05 when normalized) in Suramin alone group.

Compared to time control data (16±6% decrease), CNQX/AP5 caused a significantly greater 45±10% (n=9) reduction in the MRS2365 current.

Conclusions

In conclusion, our data suggest that ATP is released during anoxia in vitro and that it attenuates the magnitude of the secondary respiratory depression. Data also suggest that when preBötC astrocytes are activated by ATP, their release of glutamate excites inspiratory neurons, which may contribute to the ATP-mediated attenuation of the hypoxic ventilatory depression.

Funded by: WCHRI Graduate Studentship





Abstract #: 137
 Presenter: Joshua Kim
 Supervisor: Toshifumi Yokota
 Title: Converting human skin cells to muscle cells for drug testing using a retroviral vector system
 Authors: Joshua Kim, Joshua Lee, Toshifumi Yokota
 Affiliations: U of A

Introduction

Duchenne muscular dystrophy (DMD), the most common lethal genetic disorder in childhood, is characterized by progressive muscle degeneration and loss of muscle function. To test the efficacy of mutation-specific personalized medicine such as antisense therapy in vitro, patient's own muscle cells are required for drug testing. However, a muscle biopsy is an invasive and costly procedure. In addition, a muscle biopsy yields a very limited amount of muscle cells. Here, we seek to test a new method for generating skeletal muscle cells from skin cells for testing the effects of new drugs.

Methods

Both patient and healthy human fibroblasts were taken from donors and reprogrammed into muscle cells using a virus vector. The virus vector was transfected into a human embryonic kidney 293T packaging cell line using the standard calcium phosphate method with three types of plasmids: pVSV-G, pGP, and pMyoD. pVSV-G expresses a surrogate viral envelope protein, pGP expresses GFP, and pMyoD is responsible for muscle differentiation gene expression.

Results

To confirm muscle cell differentiation, expression of muscle proteins dystrophin and myosin heavy chain (a marker of skeletal muscle differentiation) were examined by immunocytochemistry and RNA analysis. A time course analysis of 3, 6, 9, 12, 15, and 18 days post-differentiation, using healthy human cells, was conducted to determine the optimal time for dystrophin expression. Immunocytochemistry revealed that dystrophin expression started at approximately day 15. RT-PCR confirmed dystrophin expression at the RNA level starting from day 3.

Conclusions

We demonstrated highly efficient conversion of fibroblast cells to muscle cells with a viral vector system. The optimal time for antisense drug delivery was chosen at the day 15 in DMD patient-derived cell lines.

Funded by: WCHRI Summer Studentship

Abstract #: 138
 Presenter: Jessica Thompson
 Supervisor: Rhonda Bell
 Title: The enrich program: promoting appropriate maternal body weight in pregnancy and postpartum through healthy eating
 Authors: Rhonda Bell, Linda McCargar, Paula Robson, Farah Bandali, Ann Marie McInnis, Maria Mayan, Ellen Toth, Hara Nikolopoulos, Jessica Thompson, Richard Oster
 Affiliations: U of A

Introduction

Team Members: R. Bell, L. McCargar, P. Robson, F. Bandali, I. Czismadi, V. Jain, S. Johansen, M. Mayan, A.M. McInnis, K. Nerenberg, H. Nikolopoulos, R. Oster, C. Rueda-Clausen, A. Sharma, J. Thompson, E. Toth, S. Tyminski, Y. Yuan

It is well known that the risks of poor maternal and fetal health issues increase when women gain either too little or too much weight during pregnancy. While gaining too little weight is associated with low birth weight and preterm birth, excessive weight gain in pregnancy contributes to increased rates of maternal and perinatal complications, illness and sometimes even death.

Methods

The Enrich Program is organized to identify key strategies to promote healthy diets and appropriate body weights by addressing the needs, gaps and opportunities in health service delivery. Universal and selected strategies will be developed through engagement with our partners within academia, provincial health service departments, communities and community-based organizations located locally, nationally and internationally. Our approach is to first generate new information focusing on dietary intake and energy expenditure and synthesize that with existing information that will inform effective weight management strategies. Based on this, we will collaborate with our partners to develop, implement and evaluate universal and selected strategies that are effective, safe, feasible, relevant, practical and cost-effective in supporting healthy eating and appropriate weight management for pregnant/postpartum women and the health care providers that serve them.

Conclusions

Together with our partners, our efforts will improve maternal health during the childbearing years of all women in Alberta.

Funded by: AIHS and The Danone Institute

Abstract #: 139
 Presenter: Joe Ou
 Supervisor: Shairaz Baksh
 Title: Inhibition of triple negative breast cancer proliferation with resveratrol and its derivatives
 Authors: Joe Ou, Yoke Wong, Shairaz Baksh
 Affiliations: U of A

Introduction

Triple negative breast cancer (TNBC) is the most devastating form of breast cancer and is characterized by lack of expression of the estrogen receptor (ER), the progesterone receptor (PR), and the human epidermal growth factor receptor 2 (Her2). This form of breast cancer is highly metastatic and typically has a poor prognosis. Because it lacks the three receptors mentioned above, it is resistant to commonly used breast cancer treatments that target the three receptors. Novel therapeutics with other mechanisms of action are needed.

Resveratrol is an antioxidant found in red wine that is known to have multiple beneficial effects, including anti-inflammatory, anti-cancer, anti-proliferative, and cardiac protective effects. Resveratrol and its derivatives may be effective in inhibiting the proliferation of TNBC cells.

Methods

MTT proliferation assays were performed to assess the anti-proliferative effects of resveratrol and ten of its derivatives (compounds 3, 6, 7, 9, 10, 11, 12, 14, 15, and 16) on two cell lines: BHK (normal non-cancer baby hamster kidney fibroblasts) and MDA-MB-231 (TNBC cells). One day after plating cells, drugs were applied in serum free media to the cells for 24 hours at final concentrations ranging from 0.03 μ M to 200 μ M.

Results

Resveratrol and six of its derivatives (3, 6, 11, 12, 14, 15) showed significant anti-proliferative effects on MDA-MB-231 cells at the concentrations tested. More importantly, these compounds, with one exception, did not show significant anti-proliferative effects on normal non-cancer cells. Compound 11 in particular was extremely cytotoxic, showing significant inhibition of growth on both cell lines.

Conclusions

Resveratrol and its derivatives are interesting compounds that may be effective in the treatment of TNBC. Further optimization of chemical structure can increase the selectivity of the compounds for TNBC cells over normal cells and the potency of the compounds.

Funded by: WCHRI Summer Studentship, Canadian Breast Cancer Foundation, and Alberta Cancer Foundation

Abstract #: 140
 Presenter: J. Takeda
 Supervisor: David Olson
 Title: Interleukin (IL)-1 receptor I and accessory protein increase at delivery in rat uterus
 Authors: T Ishiguro, H Bronson, J Takeda, X Fang, and DM Olson
 Affiliations: U of A

Introduction

Every term or preterm delivery is an inflammatory event as infiltrated leukocytes and uterine tissues release pro-inflammatory cytokines. IL-1b, a key cytokine, stimulates the parturient process by increasing uterine activation protein levels. IL-1b binds to two receptors, IL1RI and IL1RII. An accessory protein, AcP, then binds to the ligand-receptor complex leading to signal transduction. Rytvela, a specific orthostatic antagonist of AcP, delays IL-1b-induced preterm delivery in mice. The accepted view is that IL-1Rs and AcP are ubiquitously expressed. In this study we hypothesized that mRNA abundance of IL-1Rs and AcP is constant in late gestation Long-Evans rat uteri.

Methods

Upper and lower whole uterine tissues were isolated from rats (n=5) on gestational days (GD) 17, 20, 21 and in labor. The mRNA level of IL-1RI, IL-1RII, AcP, and AcPb (found only in brain) were analyzed using RT-PCR. One-way ANOVA with Dunnett's multiple comparisons test was used to evaluate results.

Results

IL-1RI mRNA abundance increases 3-fold in upper and lower uterine segments over the last 5 days of pregnancy ($p < 0.05$, 0.001). There was no change in the mRNA abundance of IL-1RII. AcP mRNA abundance increased 2-fold in both uterine segments ($p < 0.01$, 0.05) during late gestation, but surprisingly, AcPb increased 4-fold in lower uterine segment ($p < 0.01$).

Conclusions

These are the first data to describe increases in uterine sensitivity to IL-1b in late gestation and suggest another level of regulation for control of delivery. Importantly, the unexpected finding of increased AcPb suggests a possible physiological relationship between brain and uterine IL-1b action in late gestation.

Funded by: Juntendo University Faculty of Medicine, CIHR, GAPPS, WCHRI





Abstract #: 141
 Presenter: Jane Ng
 Supervisor: David Olson
 Title: Leukocyte DNA methylation (DNAm) evidence links periconceptual smoking in mothers with growth and behaviour in children
 Authors: J Ng, C Relton, DM Olson
 Affiliations: U of A

Introduction

Smoking during the periconceptual and gestational periods is associated with adverse physical and behavioural outcomes in offspring. We **hypothesize** that such exposure dysregulates newborn developmental programming through DNAm epigenetic modifications.

Methods

DNAm microarray data from the cord blood leukocytes of a convenience sample of 577 healthy children from the Avon Longitudinal Study of Parents and Children (ALSPAC) were examined. We extracted DNAm patterns related to maternal smoking periconceptually and in the first trimester of pregnancy with partial least squares regression. Differences in infant growth and child behaviour at 7 years were predicted using DNAm patterns while controlling for maternal social status.

Results

Distinct DNAm patterns in cord blood clearly separate children by maternal smoking status in the periconceptual period and first trimester. They predict rate of infant weight gain ($p < 2 \times 10^{-16}$, $R^2 = 0.19$) and linear growth ($p < 2 \times 10^{-16}$, $R^2 = 0.45$) in the first 3 months. There are no significant associations to growth in later infancy. They also predict behaviour (emotional difficulties, social skills and hyperactivity) at age 7 (e.g. hyperactivity $p < 2 \times 10^{-16}$, $R^2 = 0.04$.) Interestingly, DNAm patterns related to smoking status in the periconceptual period accounted for more variation in outcomes than those during the first trimester.

Conclusions This is the first evidence linking maternal smoking-based DNAm patterns to child outcomes. Although prediction of specific health outcomes requires more study, these findings may shed light on the biologic mechanisms underlying the adverse child outcomes attributed to maternal smoking.

Funded by: CIHR, WCHRI, MTPRF, GEoCoDE, and the families, researchers & funders of ALSPAC

Abstract #: 142
 Presenter: J. Takeda
 Supervisor: David Olson
 Title: Activation of peripheral leukocytes before term and preterm labour
 Authors: T Ishiguro, H Bronson, J Takeda, X Fang, and DM Olson
 Affiliations: U of A

Introduction

The events of parturition at term and preterm are similar to those of an inflammatory response. Local uterine and fetal membrane chemotactic factors are released prior to delivery that activates peripheral leukocytes causing them to extravasate into uterine tissues where they stimulate labour processes. Previously we demonstrated that uterine tissue homogenates contained increasing chemotactic activity as gestation progressed from term not in labour (TNL) to term in labour (TL). However, the issue of whether leukocyte responsiveness changes as pregnancy progresses was not addressed. We hypothesized that leukocyte responsiveness to a term chemotactic signal increases as gestation progresses toward the onset of labour at term and preterm.

Methods

Proteins were isolated from fetal membranes collected from patients who delivered spontaneously at term. Blood was drawn by venipuncture from four different groups of patients, TL, TNL, preterm in labour (PTL) and PTNL, and leukocytes isolated. Leukocytes and chemotactic extracts were placed into their respective sides of a Boyden chamber for the chemotaxis assay. Migrated leukocytes were quantitated using flow cytometry. ANOVA and Student's t-test assessed significance.

Results

More TL leukocytes migrated than TNL leukocytes ($p < 0.05$), and more PTL leukocytes migrated than PTNL leukocytes to a standard term chemotactic signal.

Conclusions

These data confirm that peripheral leukocyte activation in late gestation is a dynamic process whereby leukocytes become more responsive to the chemotactic signals as gestation progresses. This approach can be used to establish a preterm labour prediction test indicating who to treat to reduce the risk for preterm delivery.

Funded by: Juntendo University Faculty of Medicine, GAPPS, CIHR

Abstract #: 143
 Presenter: Caroline Jeffery
 Supervisor: Trina Uwiera
 Title: Acute mastoiditis in aboriginal and non-aboriginal children in northern Alberta
 Authors: Caroline Jeffery, Sara Horne, Trina Uwiera
 Affiliations: U of A

Introduction

Acute mastoiditis is an uncommon, but serious complication of suppurative acute otitis media. The objective of this study was to determine if differences exist in the severity and bacteriology of acute mastoiditis in Aboriginal and Non-Aboriginal Children in Northern Alberta.

Methods

A retrospective chart review of all pediatric patients admitted to the Stollery Children's Hospital, Edmonton, AB between 2000 and 2013. Patient demographic information including self-identified Aboriginal status, mastoiditis clinical course, and cultures results were reviewed.

Results

60 patients were identified with 21.8% comprised of self-identified Aboriginal children. Aboriginal children were more likely to be from rural ($p = 0.028$) and northern communities ($p = 0.044$). They were also less likely to be fully immunized ($p = 0.037$). Non-Aboriginal children were more likely to develop sigmoid or cavernous sinus thrombosis ($p = 0.002$), while Aboriginal children tended to develop subperiosteal abscesses ($p=0.020$). The overall bacteriology of acute mastoiditis also differed between the two populations.

Conclusions

Aboriginal children and Non-Aboriginal children in Alberta have different clinical course and bacteriology of acute mastoiditis.

Abstract #: 144
 Presenter: Rahim Janmohamed
 Supervisor: Winnie Sia
 Title: Postpartum vascular risk and weight management at the post-partum preeclampsia clinic (PPPEC)
 Authors: Rahim Janmohamed, Erin Montgomery-Fajic, Winnie Sia, Debbie Germaine, Jodi Wilkie, Rshmi Khurana, Kara A Nerenberg
 Affiliations: U of A

Introduction

Women with a history of preeclampsia are at increased risk of premature cardiovascular disease (CVD) [1-3]. Short-term (1-3 years post-partum) predictors of CVD risk include, a woman's post-partum weight and weight loss [4, 5]. As such, vascular prevention strategies for these high-risk women often target weight reduction as a means to modify CVD risk. A novel interdisciplinary clinic aims to reduce a woman's risk of CVD by addressing modifiable cardiovascular risk factors through education, medical management and nutritional counseling. This study's primary objective was to assess the effectiveness of this clinic's approach in achieving weight loss after approximately 6 months of follow-up. Secondary objectives were changes in vascular risk factors and clinical predictors of weight loss.

Methods

This retrospective chart review included women who completed a minimum of 6 months of follow-up at the PPPEC. Descriptive analyses of participant characteristics and changes in vascular risk factors as well as logistic regression to determine significant predictors of weight loss were performed.

Results

The mean (with standard deviation [SD]) age of 21 women was 29.1 (3.6) years. By 4.4 (1.4) months postpartum there was a non-significant reduction in the following from baseline postpartum visit: weight by 0.4 (4.5) kg, BMI by 0.1 (1.7) kg/m², and blood pressure (mmHg) by 3.9 (12.9) systolic and 1.9 (7.3) diastolic.

Conclusions

These preliminary results show promising improvements in CVD risk factors in women with preeclampsia. Longer-term follow-up is planned to better evaluate the effectiveness of the interventions currently being utilized in the PPPEC.

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Abstract #: 145
 Presenter: Venu Jain
 Supervisor:
 Title: Outcomes of pregnancies complicated by red blood cell antibodies
 Authors: Rhonda Zwingerman, Venu Jain, Judy Hannon, Gwen Clarke
 Affiliations: U of A

Introduction

Hemolytic disease of the fetus and newborn (HDFN) occurs when maternal alloantibodies to red blood cell (RBC) antigens cross the placenta and attack fetal RBCs. The objectives of this study were to review pregnancies that screened positive for RBC antibodies, to examine the fetal and neonatal outcomes of these pregnancies, and to evaluate the relationship between antibody titres and these outcomes.

Methods

This study was a retrospective review of pregnancies that screened positive for RBC antibodies from 2006 to 2010. The following antibodies were included: anti-D, -C, -c, -E, -e, -Fy^a-Fy^b, -Jk^a, and -Jk^b. Cases of anti-D served as the reference group. Cases where anti-Kell was the sole antibody were excluded. Kell titre are not routinely measured at our institution, given that Kell-mediated HDFN is known to be independent of titre. Other exclusion criteria included: missing or duplicate data, residing outside the study catchment area, passive or auto-antibodies, and a non-prenatal sample. For cases with multiple antibodies, the antibody with the highest titre was used for analysis.

Results

A total of 638 cases were identified, and 566 remained after exclusion criteria were applied. The distribution of antibodies in our study population was: anti-E = 49.3%, anti-c = 16.5%, anti-Jk^a = 10.9%, anti-D = 7.1%, anti-C = 6.6%, anti-Fy^a = 4.8%, anti-e = 2.7%, anti-Jk^b = 1.5% and anti-Fy^b = 0.5%. There were seven cases in which the fetus required at least one intra-uterine transfusion or that resulted in fetal demise. Anti-D was the primary antibody in four of these cases, and anti-Fya in the other three. The maximum antibody titre was ≥ 16 in all these cases. In total, 5 neonates required exchange transfusion, 3 required top-up transfusion, 11 received IVIG and there were 2 cases of neonatal death. The maximum antibody titre was ≥ 8 in all these cases. There were 32 additional cases for which delivery was undertaken before the due date because of alloimmunization. Thirty-four percent of these deliveries occurred prior to 37 weeks gestation.

Conclusions

This is the first Canadian study to examine the distribution of RBC antibodies and their associated outcomes in a prenatal population. Anti-E was the most prevalent antibody encountered, yet anti-D was responsible for the majority of severe cases of HDFN.

Funded by: WCHRI Trainee Travel Grant

Abstract #: 146
 Presenter: George Michael
 Preceptor: Justine Turner
 Title: Knowledge, beliefs, and attitudes regarding the use of donor human milk in neonatal intensive care units in Edmonton
 Authors: George Michael, Sharif Shaik, Marcia Antunes, Justine Turner
 Affiliations: U of A, AHS

Introduction

Human milk is the ideal nutrition for neonates, providing benefits to host defense, gastrointestinal maturation, and neurodevelopment. In the neonatal intensive care unit (NICU) setting, when compared to formula-fed newborns, newborns fed with maternal human milk had lower rates of sepsis and necrotizing enterocolitis (NEC). The same benefits are shown with use of donor human milk (DHM) in preterm infants, including reduction in the risk of developing NEC. However, DHM is not widely available in the majority of Canadian NICUs. As a donor milk bank is now available in Alberta, it would be valuable to know current attitudes and beliefs of NICU staff with regards to use of DHM and potential local barriers to use.

Methods

A survey was developed and sent to all staff at the David Schiff NICU (Stollery Children's Hospital) and the Royal Alexandra Hospital NICU. Staff included physicians, neonatal fellows, nurse practitioners, bedside nurses, and dietitians. The survey addressed knowledge regarding advantages and disadvantages of DHM as compared to mother's own milk or formula, attitudes and beliefs regarding the use of DHM, as well as barriers to using DHM. Demographic information was also provided by the participants.

Results

71 responses were collected from both sites. 75% agreed preterm infants receiving DHM have lower rates of NEC compared to those receiving formula. 90% agree that DHM should be a first-line alternative when mother's milk is not available. Only 33% responded that DHM was offered as an alternative to mother's milk more than 75% of the time, and 41% responded that DHM was offered less than 50% of the time. Barriers to the use of DHM included cost/funding (74%), access/restrictions (73%), and parent preference (61%).

Conclusions

Although use of DHM appears well supported by NICU staff, its current use does not seem to be in keeping with this level of support. This is despite the availability of a donor milk bank in Alberta since April 2012. The local barriers to use that were identified and need to be addressed include the costs as well as current policies regarding DHM use in both NICUs.

Funded by: WCHRI Trainee Research Grant

Abstract #: 147
 Presenter: Stephanie Pau
 Preceptor: Janet Ellsworth
 Title: Diagnosis, treatment, and follow-up of Kawasaki Disease in a pediatric tertiary care center: a quality review
 Authors: Stephanie Pau, Janet Ellsworth, Jennifer Walton, Dawn Hartfield, Andrew Mackie, Kristen Johnson
 Affiliations: U of A

Introduction

Kawasaki disease (KD) is an acute childhood vasculitis that manifests with a combination of fever and 5 principal features. KD is the leading cause of acquired cardiovascular disease in children in North America and an important cause of childhood morbidity and mortality owing to its predilection for coronary arteries. Proper treatment of KD can decrease this risk. We conducted a retrospective chart review to evaluate adherence to the AHA/AAP guidelines for diagnosis of both typical and incomplete KD, management, and follow up in our tertiary care centre.

Methods

We reviewed the charts of all patients admitted with the diagnosis of "Kawasaki Disease" between January 2004 and December 2011. The clinical diagnostic criteria and supporting laboratory criteria were identified for each patient at time of diagnosis. Each patient was categorized as typical or incomplete KD independently (using the AHA/AAP published guidelines (2004)) based on the retrospective information and this was compared to the admitting physician's diagnosis. Information on dose and duration of IVIG and ASA therapy was collected in addition to arrangements for follow-up and repeat echocardiograms.

Results

A total of 153 charts were reviewed. At the time of abstract submission, we were still undergoing data collection. However, frequency distributions will be used to summarize all categorical data which will include: patient gender and age; proportion of patients meeting each individual clinical criterion or 1, 2, 3, 4, or 5 clinical criteria in combination; proportion of patients with abnormal laboratory results; with coronary artery aneurysms or with any abnormal echocardiographic findings; proportion of patients receiving initial treatment with IVIG and ASA and those requiring repeat IVIG doses; adverse events due to therapy; and proportion having appropriate echocardiographic and clinical follow-up. Data will then be reviewed qualitatively to determine if AHA guidelines were followed in each case with patient diagnosis, treatment and follow-up.

Conclusions

This information may be used in support of developing a clinical practice guideline for our institution, thus ensuring all patients in our facility are receiving standard of care concerning the diagnosis, treatment and follow-up of KD.

Funded by: WCHRI Trainee Research Grant

Abstract #: 148
 Presenter: Jackie Clayton
 Preceptor: Sunita Vohra
 Title: Systematic review of outcome measures in randomised controlled trials of pediatric concussion treatment
 Authors: Jackie Clayton, Tamar Rubin, Sunita Vohra, Denise Adams, Hsing Jou
 Affiliations: U of A

Introduction

Randomized controlled trials [RCTs] are the gold standard for developing evidence-based clinical guidelines. Unfortunately, a major threat to the validity of pediatric RCTs has surfaced as the outcome measures reported in trials are diverse and often not validated.

The primary objective of this systematic review (SR) is to assess the heterogeneity of outcome measure selection and reporting in pediatric concussion treatment trials. As secondary objectives, we assess the variation of disease definitions across studies and analyze the efficacy of concussion treatments.

Methods

We searched MEDLINE, EMBASE, The Cochrane Library, Cochrane Central Register of Controlled Trials (CENTRAL) and CINAHL from 1990 to 2013, including RCTs of concussion treatments in patients 0-19 years old. We searched several online databases for ongoing trials. Two authors independently assessed the studies for inclusion. For ongoing trials, we attempted to contact the authors.

Results

642 unique trials were assessed and 8 met inclusion criteria. One study was a published RCT; one was a published abstract, and six were ongoing or unpublished trials. The studies used a myriad of outcome measures including symptoms, neurocognitive tests, behavior scales, and parental satisfaction. Only one study protocol reported the psychometric properties of their primary outcome measures. Where provided, the disease definitions were unique to each trial. Due to the paucity of completed pediatric concussion RCTs, no conclusions could be made regarding treatment effect.

Conclusions

This SR confirms that outcome measures in pediatric concussion trials are heterogeneous and often not validated. It is encouraging that new research is emerging in the area of pediatric concussion treatment. However, without uniform outcome measures and disease definitions, forming conclusions about treatment effect will be challenging.

Funded by: WCHRI Trainee Research Grant





Abstract #: 149
 Presenter: Eileen Estrabillo
 Preceptor: Linda Casey
 Title: Predictors of difficult feeding behaviours in children
 Authors: Eileen Estrabillo, Linda Casey, Catherine Field, Rhonda Bell
 Affiliations: U of A

Introduction

Feeding plays an important role in parent-infant interactions. Parents and caregivers commonly express difficulty in feeding their children. Between 25% to 40% of normally developing infants and toddlers are reported to have feeding problems such as colic, vomiting, slow feeding, and food refusal. Difficulties can begin at the age of 4 months and persist to the age of 8 years or longer. This can have psychological, nutritional and medical consequences and create tremendous stress for the family. The objective of this study was to determine the prevalence of difficult feeding behaviours among normally developing children, and to identify factors that may predict these behaviours in the first year of life.

Methods

The sample was drawn from a population-based cohort enrolled in the Alberta Pregnancy Outcomes and Nutrition Study. Infant participants were analyzed at baseline, 3-month, 6-month and 12-month time points (12-month data pending). Difficult feeding behaviours were defined using items from the Infant Feeding questionnaire and combined using exploratory factor analysis. These included infant cues of hunger and satiety, food refusal and acceptance, and regularity of feeding schedules. Expected predictors of difficult feeding included the age of introduction of solids, episodes of regurgitation, caregiver anxiety, number of exposures to food textures, and parental self-efficacy regarding feeding. Data were analyzed using SPSS.

Results

Feeding data were available for 456 infants at three months, and 302 infants at six months. At three months of age, nearly all infants (99%) were breastfed and 52% (n=236) also consumed formula. Less than 1% had been introduced to cereals (n=4). At 6 months of age, 79% of infants (n=238) continued to be breastfed, 57% (n=173) took formula, and 73% (n=220) had been introduced to cereal, pureed vegetables, or infant cookies. The most commonly identified feeding difficulties at 6 months were in knowing when the infant has had enough to eat (n=99, 33%), and infant food refusal (n=94, 31%). Regression analyses for predictors of difficult feeding behaviours are in progress pending the availability of 12-month feeding data.

Conclusions

Difficult feeding behaviours are common challenges for caregivers of young children. Additional analyses from this study will provide a better understanding of the factors associated with feeding problems and inform the development of prevention-oriented strategies.

Funded by: WCHRI Trainee Research Grant

Abstract #: 150
 Presenter: Chelsey Grimby
 Preceptor: Sarah Curtis
 Title: Parenteral and oral antibiotic duration for treatment of pediatric osteomyelitis: a systematic review.
 Authors: Chelsey Grimby, Jeff Odenbach, Ben Vandermeer, Sarah Forgie, Sarah Curtis
 Affiliations: U of A

Introduction

Pediatric osteomyelitis is a bacterial infection of bones requiring prolonged antibiotic treatment using parenteral followed by enteral agents. Historically, osteomyelitis has been treated with long durations of antibiotics to avoid these complications. However, with improvements in management and antibiotic treatment, standard of care is moving towards short durations of intravenous antibiotics prior to enteral antibiotics.

Methods

The authors performed a systematic review based on PRISMA guidelines in order to evaluate the literature, looking for evidence supporting optimal duration of parenteral and enteral therapy, to see if literature supports shorter durations (less than 7 days) of either parenteral antibiotics and/or enteral antibiotics. Multiple databases were investigated including Medline, Cochrane, EMBASE, SCOPUS, Dissertation Abstracts, CINAHL, Web of Science, African Index Medicus and LILACS. The search strategy included medical subject heading for pediatric patients with osteomyelitis and antibiotic therapy, searching for published or unpublished randomized and quasi-randomized controlled trials. Two authors independently screened and selected articles, extracted data, and assessed risk of bias by standard Cochrane methodologies.

Results

4800 articles were found on initial search. 200 complete articles were screened, and 6 articles were found for inclusion. The reviewers are in the process of data extraction and risk of bias assessment, with the intention of analyzing comparisons between dichotomous outcomes using risk ratios and continuous outcomes using mean differences. 95% confidence intervals will be computed.

Conclusions

One of the major dilemmas of management of this disease is the duration of parenteral therapy. Long parenteral therapy has increased risk of complications and the necessity for long therapy has been called into question. Few randomized controlled trials are available but the literature evaluated shows that standard of practice has moved towards shortened intravenous and enteral duration of therapy without worsening complications or clinical outcomes. We speculate if this is due to improved access to health care, timely diagnosis of osteomyelitis, and improved selection of antibiotics.

Funded by: WCHRI Trainee Research Grant

Abstract #: 151
 Presenter: Jessica Nicoll
 Preceptor: Georg Schmölzer
 Title: Exhaled carbon dioxide and its relationship to neonatal breathing patterns in preterm infants immediately after birth.
 Authors: Jessica Nicoll, Po-Yin Cheung, Khalid Aziz, Vishaal Rajani, Megan O'Reilly, Gerhard Pichler, Georg Schmölzer
 Affiliations: U of A

Introduction

Immediately after birth, infants initiate breathing and achieve lung aeration through different breathing patterns. If infants fail to breathe spontaneously after birth, positive pressure ventilation is recommended to achieve lung aeration. There is little information on the degree of ventilation and pulmonary gas exchange of infants in the delivery room. The aim of our study was to examine the different neonatal breathing patterns involved in achieving lung aeration and their correlation to exhaled CO₂ (ECO₂) in preterm infants immediately after birth.

Methods

Preterm infants of <37 weeks gestation born at the Royal Alexandra Hospital, were eligible for the study. Immediately after birth, a combined CO₂/flow sensor attached to a facemask was placed over the mouth and nose of infants to record ECO₂ and gas flow. A breath-by-breath analysis was performed for the first 5 minutes after birth to examine the amount of ECO₂ during different breathing patterns.

Results

From January to August 2013, 10 infants were included with birth weight of 2241±(SD)266g and gestational age of 33±2 weeks. The ECO₂ for each breathing pattern was 28±7 mmHg for normal breathing, 28±12 mmHg for expiratory hold, 26±12 mmHg for crying or grunting and 28±8 mmHg for panting, with no significant change during time (p=0.29). There was no significant difference in ECO₂ among various breathing patterns throughout the first 5 minutes after birth (p=0.07 to 0.49). ECO₂ during positive pressure ventilation trended lower (15±11 mmHg vs. spontaneous breathing, p=0.07).

Conclusions

ECO₂ production was similar with each breathing pattern and within the first 5 minutes of monitoring. However, there is a trend to higher ECO₂ values during spontaneous breathing compared to positive pressure ventilation.

Co-supervisors: Georg M. Schmölzer and Po-Yin Cheung, Department of Pediatrics

Funded by: WCHRI Trainee Research Grant

Abstract #: 152
 Presenter: Fareeha Nasir
 Preceptor: Joan Robinson
 Title: Awareness of and adherence to clinical practice guidelines among pediatric physicians in Canada
 Authors: Fareeha Nasir, Katharine Nicholson, Ben Vandermeer, Manoj Kumar, Joan Robinson
 Affiliations: U of A

Introduction

The Canadian Pediatric Society (CPS), the American Academy of Pediatrics (AAP) and other bodies use time, cost and effort to publish and update pediatric-specific guidelines for physicians practising child health. Our objective was to compare attitudes towards guidelines by paediatricians and paediatric residents.

Methods

An observational cross-sectional study was performed via distribution of an email survey (mailed to those without email) to all general paediatricians (GPs) and paediatric emergency physicians (EPs) in Edmonton and Ottawa, and to all general paediatric residents in Canada. The study focussed on how often they use CPS or AAP guidelines, how they prefer to access them, and their assessment of their applicability to practice. Results were compared for residents, GPs -divided into 3 groups based on if they teach on a clinical teaching unit (CTU) for >6 weeks/year (GPA), 1-6 weeks per year (GPB), or rarely (GPC) and EPs.

Results

Total response rate was 179/850= 21% (Residents- 88/636=14%, GPA-13/22=59%, GPB and GPC combined- 40/134=30%, EPs- 38/58=66 %). The frequency of using guidelines was significantly different among all the groups (p=0.0002). Guidelines were used > once/month by majority of residents -62%, EPs -54%, GPA -55% but by only 21% of GPB and 14% of GPC. Frequency of guidelines use didn't vary by years of training for residents or by years of practice, gender, number of patients seen/day or city of practice for GPs/EPs. Use of and agreement with CPS guidelines is significantly higher than AAP ones (p=0.000000000000004). Preferred ways to access guidelines are paper copy/journal- 12/179(7%), Online -on desktop-127/179(71%), on hand-held device-41/179(23%), electronic saved copy- 28/179(16%), other-1/179(0.5%). 84.3% of physicians agreed that guidelines improve patient outcomes, yet 11.2% have used guidelines they disagreed with due to worry of blame or getting sued.

Conclusions

Our results show that GPs who teach more on CTUs use guidelines frequently compared with GPs who do not. Further study is needed to find out about the barriers to guidelines use in the group that uses them the least. CPS guidelines are preferred over AAP guidelines and an online version of guidelines is more popular than a saved paper copy.

Funded by: WCHRI Trainee Research Grant





Abstract #: 153
 Presenter: Elsa Fiedrich
 Preceptor: Chloe Joynt
 Title: Self-evaluation of procedural skill competencies by Neonatal Perinatal Medicine trainees in Canada
 Authors: Elsa Fiedrich, Harish Amin, Jonathan White, Chloe Joynt
 Affiliations: U of A, AHS

Introduction

To examine the self-reported attitudes and procedural skill competencies of Neonatal Perinatal Medicine (NPM) trainees across Canada for 19 procedural skills listed by the Royal College for NPM training.

Methods

A cross-sectional confidential electronic survey was sent to 1st and 2nd year NPM trainees in 13 Canadian NPM programs (2012-2013). A five-point Likert scale was used to rate perceived importance (1= not important to 5=very important) and competence (1= not competent to 5= neonatologist) of each skill before and during their NPM training. Demographic and training data was collected. Two-tailed paired t-tests ($p < 0.05$) were used to analyze pre versus current training "competence" for each skill. Only anonymous aggregate data was reported.

Results

Forty-seven trainees (68%) completed the survey of which 36 consenting respondents with greater than 6 months Canadian NPM training were analyzed. Only 25% of trainees were FRCPC exam eligible (CMG) (25%), with majority of respondents 12-24 months (47.3%) into their training. There were larger changes in pre versus current training perceived competencies in CMG compared to international medical graduates. Most CMG's procedural skills reached competence and improved by > 1 during training, with the exception of suprapubic (mean difference 0.55), urinary catheterization (0.67), pericardiocentesis (0.45), and paracentesis (1.00). Pericardiocentesis did not meet competence (1.9/5) despite type and duration of training. Skills performed frequently in NICU (compared to pediatric residencies): umbilical lines (1.3), intubation (1.2), chest tubes (1.7), PICC lines (1.7), and arterial lines (1.5) had a high level of change and competence. Despite training, some NICU procedures rated poorly (x/5) in self-rated competence including paracentesis (2.4), PICC line insertion (3.1), suprapubic tap (2.2) and exchange transfusion (3.1).

Conclusions

Observed skills most frequently done by trainees have the greatest change in competence during training for CMG in NPM. Some necessary procedural skills may require changes to instruction methods and these results could help guide curricular improvement.

Funded by: WCHRI Trainee Research Grant

Abstract #: 154
 Presenter: Hanaa Abdellateef
 Preceptor: Juzer Tyebkhan
 Title: Impact of Birth Kangaroo Care (BKC) on admission to NICU for late preterm infants
 Authors: Hanaa Abdellateef, Juzer Tyebkhan
 Affiliations: U of A

Introduction

Birth Kangaroo Care (BKC) is defined as prolonged skin to skin contact (SSC) between mother and baby immediately from the time of birth. The well-documented benefits of this intimate contact for the infant are attributed largely to maternal co-regulation of the infant's behavioural functioning. BKC should therefore promote optimal behavioural transition to extra uterine life for late preterm infants, defined here as those born at 35 – 36 weeks gestational age (wGA), and reduce their need for NICU admission. Although BKC has been promoted over the past few years for late preterm infants, its impact on their need for NICU admission has not been systematically studied.

PURPOSE: 1. To compare the rates of BKC and NICU admission for late preterm infants for the years 2006 and 2012. 2. A feasibility study, to compare the rate of NICU admission for late preterm infants who receive BKC supported by the investigator (HA), to NICU admission rate for infants who do not receive this support.

HYPOTHESES: 1. There was a significant increase in the numbers of late preterm infants who received BKC in 2012, compared to 2006, and an associated decrease in NICU admission for these infants in 2012 compared to 2006. 2. NICU admission rate and length of hospital stay (LOS) will significantly decrease for infants who receive at least 2 hours BKC.

Methods

1. Chart review of all late preterm infants born at RAH in 2006 and 2012 to determine [a] whether BKC was provided; [b] if so, duration; [c] need for NICU admission; [d] diagnoses and [e] LOS. 2006 is selected as a control year as BKC was not promoted for late preterm infants at that time. 2. For this feasibility study a convenience sample size of 30 infants who receive BKC will be enrolled and their data compared to controls. The investigator (HA) will attend deliveries of late preterm infants for whom there are no other indications for NICU admission. HA will assist mother to provide BKC for at least 2 hours. All medical and nursing procedures will be delayed until after this time. Data to be collected includes [a] whether BKC was possible; [b] if so, for how long; [c] need for NICU admission; [d] diagnoses and [e] LOS. These data will be compared to those of control infants, defined as late preterm infants with no other indication for NICU admission, but born when HA is not able to attend delivery to assist with BKC.

Results

Differences in frequencies of these outcomes will be assessed using appropriate statistical tests. The study is expected to begin in July 2013 and to be completed by June 2014.

Conclusions

The feasibility of BKC and its impact on NICU admission will assist in the development of clinical practice guidelines for late preterm infants.

Abstract #: 155
 Presenter: Andrea L. Chambers
 Preceptor: Samina Ali
 Title: Pediatric pain management practice and policies across Alberta emergency departments
 Authors: Andrea L. Chambers, Samina Ali, David W. Johnson, William R. Craig, Amanda S. Newton, Ben Vandermeer, Sarah J. Curtis
 Affiliations: U of A

Introduction

Most children requiring acute care are treated in general emergency departments (EDs). Effective interventions to manage pediatric pain are available; however, information regarding their use is limited. This prospective study assessed reported pediatric pain management practice and policies across EDs in Alberta.

Methods

This study was a prospective, descriptive, cross-sectional survey of all ED administrators in the province of Alberta, Canada. A novel survey tool was developed based on expert opinion, and administered via telephone or post. The U of A's Health Research Ethics Board approved this study prior to its initiation. This study was investigator funded.

Results

We obtained a response rate of 67% (72/108). The mean pediatric census was 20.9% of the total, excluding the two pediatric-specific EDs. Seventy-one percent (42/59) of administrators reported use of a pain tool, and 29.3% (17/58) reported a policy for mandatory pain documentation. Nurse-initiated protocols for analgesia existed in 16.7% (10/60) of EDs, and included use of ibuprofen, acetaminophen, or topical anaesthetics. Most (82.1%; 46/56) administrators reported that their ED performed pediatric procedural sedation, and 44.0% (22/50) had a policy to guide this practice. Topical anaesthetics were used for intravenous (IV) insertion by 70.4% (38/54), and for lumbar puncture (LP) by 30.8% (12/39). Oral sucrose was used infrequently for urinary catheterization (2.2%; 1/46), IV insertion (0%; 0/54) and LP (2.6%; 1/39). To guide pediatric pain management, 35.1% (13/37) of administrators desire more policies and/or protocols, and 27.0% (10/37) would like more education.

Conclusions

Few EDs in Alberta use policies and protocols to manage pediatric pain. Despite strong evidence, non-invasive methods to limit procedural pain in children are under-utilized. Oligoanalgesia continues to be an issue for children receiving acute care in Alberta, and administrators desire assistance in optimizing pediatric analgesia. Canadian pediatricians must advocate for improved pain management for children to narrow this knowledge to practice gap.

Abstract #: 156
 Presenter: Lannae Strueby
 Supervisor: Bernard Thébaud
 Title: Paracrine effect of mesenchymal stem cells on ventilation induced lung injury in neonatal mice
 Authors: Lannae Strueby, Megan O'Reilly, Marius Moebius, Farah Eaton, Bernard Thébaud
 Affiliations: U of A

Introduction

Bronchopulmonary dysplasia (BPD) is a common complication of extreme prematurity. Preterm infants often require mechanical ventilation and oxygen exposure for survival, these interventions can contribute to their risk of developing BPD. Despite its frequency there remains no effective treatment for BPD. Recent evidence suggests that mesenchymal stem cells (MSCs) prevent oxygen-induced lung injury in neonatal rodent models of BPD. The therapeutic benefits observed appear to be mediated via a paracrine effect. Our objective was to determine if cell free conditioned media (CDM) from human umbilical cord blood-derived MSCs (MSC-CDM) attenuates lung damage in a clinically relevant neonatal mouse model of BPD combining inflammation, ventilation-induced lung injury and supplemental oxygen.

Methods

Neonatal mice (C57Bl/6) were mechanically ventilated at postnatal day 9-10 for 8 hours with a tidal volume of 10ml/kg, 180 breaths/minute and 40% oxygen. An inflammatory response was induced by intraperitoneal administration of lipopolysaccharide (LPS, 4µg/g) 48 hours prior to mechanical ventilation. Age matched unventilated mice that did not receive LPS were used as controls. The treatment group received intratracheal MSC-CDM (3µl/g) immediately prior to mechanical ventilation. At completion of mechanical ventilation lungs were harvested and fixed with a formalin solution at 20 cm H₂O. Lung alveolar structure was analyzed by measuring the mean linear intercept (MLI).

Results

Neonatal mice that were mechanically ventilated exhibited alveolar simplification demonstrated by a significantly greater MLI compared to controls ($p < 0.05$). Preliminary data indicates that treatment with MSC-CDM partially attenuates lung injury as demonstrated by a significant reduction in MLI compared to untreated, ventilated mice ($p < 0.05$).

Conclusions

Preliminary results show that treatment with MSC-CDM can attenuate structural lung injury in a clinically relevant neonatal mouse model of BPD.

Funded by: WCHRI Trainee Research Grant, Sandra Schmirler Foundation



Abstract #: 157
 Presenter: Gaurav Nagar
 Preceptor: Manoj Kumar
 Title: Reliability of Transcutaneous Bilirubin devices in preterm infants: a systematic review
 Authors: Gaurav Nagar, Ben Vandermeer, Sandy Campbell, Manoj Kumar
 Affiliations: U of A and AHS

Introduction

Transcutaneous Bilirubinometer (TcB) devices are widely used for the estimation of serum bilirubin in term and near-term infants. Our objective was to review the diagnostic accuracy of TcB devices in preterm infants.

Methods

Data Sources: MEDLINE, EMBASE, Cochrane library, CINAHL and Scopus were searched (until December 2012). Additional citations were identified using bibliography of selected articles and from conference proceedings. Study Selection and Data Extraction: The studies were included if they compared TcB with TSB in preterm infants prior to phototherapy and presented data as correlation coefficient(r) or as Bland Altman (BA) difference plots. Data were extracted by one reviewer and checked for accuracy by the second reviewer. QUADAS-2 tool was used for risk of bias assessments.

Results

22 studies met the inclusion criteria. 21 studies reported results as correlation coefficients, with pooled estimates of $r=0.83$ for each site of measurement. Pooled estimates in 32 weeks infants were similar to the overall preterm population [$r=0.89$ (95% CIs 0.82- 0.93)]. For the two commonly used TcB devices, i.e., JM103 and Bilicheck, the results were comparable at the forehead, however, JM103 device showed better correlation at sternum. Analysis of the BA plots (13 studies) revealed negligible bias in measurement at forehead or sternum site using either JM103 or Bilicheck device; however, JM103 device showed better precision than the Bilicheck (SD for TcB-TSB differences= 24.3 and 31.98 $\mu\text{mol/l}$, respectively).

Conclusions

The TcB devices reliably estimate bilirubin levels in preterm infants and could be used in clinical practice to reduce blood sampling

Funded by: WCHRI Trainee Research Grant

Abstract #: 158
 Presenter: Praveen Kumar
 Preceptor: Lisa Hornberger
 Title: Impact of intrauterine exposure to chronic hypoxia on myocardial and arterial function from early postnatal developmental stages in the rat
 Authors: Praveen Kumar, Jude Morton, Donna Becker, Sandra Davidge, Lisa Hornberger
 Affiliations: U of A

Introduction

Intrauterine growth restriction due to placental insufficiency is one of the risk factors for adult cardiovascular disease in humans. It has been shown in adult animal models that fetal hypoxia, one of the insults related to placental insufficiency, is associated with ventricular diastolic and arterial dysfunction. The responsible pathogenic mechanisms and timing of development of these cardiovascular abnormalities remain unclear. We hypothesized that intrauterine exposure to hypoxia impacts ventricular function and aortic stiffness from early developmental stages. We sought to evaluate myocardial function and aortic stiffness from day 1 to week 8 in Sprague-Dawley rats exposed to hypoxia in utero.

Methods

Three pregnant rats were exposed to hypoxic conditions (11.5%FiO₂) from E15-21 and four were maintained in normoxic conditions. After delivery, four neonatal rats from each hypoxic pregnancy and four normoxic (control) pregnancies were examined longitudinally at day 1, day 3, week 1, week 2, week 4 and week 8 for changes in left ventricular (LV) function and aortic stiffness. Pups were anesthetized using 1.5% isoflurane. Visualsonics ultrasound system with 30-70MHz transducers was used to image cardiac structures and to perform pulsed flow and tissue Doppler (TDI) investigations. Aortic stiffness was assessed by measuring the pulse wave velocity (PWV) between the ascending aorta and the descending aorta at the level of the bifurcation. Longitudinal assessment between the groups was performed using a generalized linear mixed model.

Results

No significant difference was observed in systolic function parameters (ejection fraction, fraction shortening and corrected velocity circumferential fiber shortening, TDI S') between hypoxia and control pups at all ages. With respect to LV diastolic function, TDI septal E'/A' ratio increased from 0.7 ± 0.1 (SD) to 1.3 ± 0.2 (SD) in controls and 0.6 ± 0.1 (SD) to 0.8 ± 0.1 (SD) in hypoxia pups with significantly lower E'/A' in hypoxic rats from week 2 onwards ($p<0.0001$). Isovolumic relaxation time decreased from 26.2 ± 2 (SD) to 19.1 ± 2 (SD) in controls and 25.2 ± 5.8 (SD) to 12.6 ± 2.7 (SD) msec in hypoxia rats respectively from day 1 to week 8, and was significantly lower in hypoxic animals from week 1 onwards ($p<0.0001$). Aortic PWV remained constant in control pups from day 1 to week 8. In fetal hypoxia pups, PWV was significantly increased on day 1 (5.1 ± 1.4 m/s vs controls 2.5 ± 0.3 m/s; $p=0.004$) and although it decreased by week 2 (3.7 ± 0.7 m/s), it remained significantly increased versus controls through to week 8 (4.8 ± 0.6 m/s vs controls 3.7 ± 0.3 m/s; $p=0.03$).

Conclusions

Prenatal exposure to hypoxia was associated with altered diastolic function and increased aortic stiffness very early in development. That increased aortic stiffness precedes changes in myocardial function could suggest a causal relationship.

Funded by: WCHRI Trainee Research Grant

Abstract #: 159
 Presenter: Sneha Suresh
 Preceptor: Joan Robinson
 Title: CMV prevention in pediatric solid organ transplant recipients
 Authors: Sneha Suresh, Joan Robinson, Jutta Preiksaitis, Bonita Lee
 Affiliations: U of A

Introduction

CMV viremia (CMVv) can lead to CMV disease and cause significant morbidity in solid organ transplant recipients. Risk factors for acquisition are often non-modifiable. Numerous prevention strategies with antiviral medications exist and inter-institutional variability in choice of protocols is high. Previous studies have shown the incidence of CMVv to range from 4-26%. At the Stollery Children's Hospital, a hybrid strategy of prophylactic and pre-emptive therapy based on donor/recipient (D/R) status is used. We hypothesize that this results in a low incidence of CMVv.

Methods

The outcomes of pediatric solid organ transplants performed from 2004-2010 at the Stollery Children's Hospital were reviewed. Data was collected according to transplant type, D/R CMV status and type of immunosuppression and prophylaxis used. The primary outcome was incidence of CMVv in different risk groups (high D+R-(HR), medium D+R+/D-R+(MR), low D-R-(LR)) by organ type. Statistical significance among risk group and organ type was assessed using binary multiple logistic regression.

Results

218 transplants for 190 patients were reviewed and 17 transplants were excluded. Median days of follow-up were: heart (1,317), multivisceral (582), liver (1,273), kidney (1,678), and lung (1,058). CMVv was found in 58/201 (29%): 14/79 (18%) hearts (HR:23%, MR:27%, LR:4%), 1/3 (33%) multivisceral (HR only), 30/88 (30%) livers (HR:56%, MR:27%, LR:17%), 10/27 (37%) kidneys (HR:67%, MR:44%, LR:0%) and 3/4 (75%) lungs (1 HR & 2 MR). Using binary multiple logistic regression CMV serostatus remained a significant risk factor for CMVv; and liver, kidney, and lung had higher risk of CMVv as compared to heart recipients ($P < 0.05$).

Conclusions

A hybrid strategy of prophylactic and pre-emptive therapy for CMVv resulted in a higher incidence of viremia as compared to data published from other centers. D/R CMV status and organ type are risk factors for CMVv. Further analysis of the morbidity resulting from CMVv, including CMV disease, is required to determine if the local protocol should be changed. This study lays the groundwork for future studies by providing a baseline incidence rate.

Funded by: WCHRI Trainee Research Grant

Abstract #: 160
 Presenter: Deliwe Ngwezi
 Preceptor: Lisa Hornberger
 Title: Congenital heart disease and the emission of developmental toxicants in Alberta, Canada
 Authors: Deliwe Ngwezi, Lisa Hornberger, Brad Saretsky, Sujata Chandra, Deborah Fruitman, Alvaro Osornio-Vargas
 Affiliations: U of A

Introduction

Congenital heart disease (CHD) is a significant global public health issue affecting 1% of all live births and the most common lethal congenital abnormality in infancy. Although CHD may occur in the presence of chromosomal abnormalities, in most affected children, the cause is unknown. The role of environmental pollutants has recently received attention. We sought to explore the association of developmental toxicants (DTs) from industrial sources and CHD in Alberta, Canada through an interdisciplinary multistep study.

Methods

In this ecologic study we collected the following data: 1) Chemical emissions between 2003-2010 from Canada's National Pollutant Release Inventory (NPRI). We used Scorecard criteria to identify corresponding toxic equivalent potential (TEP) values of the chemicals in order to calculate risk scores. 2) CHD cases born between 1/06/04-31/08/11 from Stollery Children's Hospital Xcelera database were assigned the mother's first trimester as the year of exposure and 3) Annual births from Statistics Canada were used to calculate rates of CHD. A Principal Component Analysis (PCA) of the DTs was undertaken using STATA 12.

Results

We identified 1903 cases of CHD and we focused on 17 DTs emitted to air because 99% of all the NPRI's emissions are released to air. The multivariate PCA identified 3 groupings or components of the 17 DTs. Component 1, which consisted of 13 DTs, a mixture of metals and volatile organic compounds (VOC), was strongly correlated with rates of CHD ($r = 0.94$, $p < 0.01$). Component 2, which consisted of 2 VOCs, showed weak correlation with rates of CHD ($r = 0.06$, $p = 0.87$), and component 3, with 2 other DTs, showed negative correlation with rates of CHD ($r = -0.91$, $p = 0.82$). PCA analysis revealed a fairly acute change in the pattern of rates of CHD after the year 2006. Interestingly, in 2006 the Canadian government introduced and implemented Canada's Chemicals Management Plan aimed at reducing industrial emissions.

Conclusions

Our preliminary results suggest a link between mixtures of industrial pollutants and CHD in Alberta supported by the retrospective inference of change in the correlations of rates of CHD and the 3 components after the year 2006. These changes are currently being explored.

Funded by: WCHRI Innovation Grant





Abstract #: 161
 Presenter: Long Guo
 Preceptor: Ian Adatia
 Title: Oxygen consumption measurement in children after cardiac surgery: a comparison of breath by breath method and mass spectrometry
 Authors: Long Guo, Yong Cui, Pashant Bobhate, Shreepal Jain, Ian Adatia
 Affiliations: U of A

Introduction

Low cardiac output syndrome is major determinant of adverse outcomes in children after cardiac surgery. However, cardiac output (CO) is difficult to measure and not routinely performed. CO maybe calculated easily from the Fick equation using hemoglobin and mixed venous saturation, which are readily available, and oxygen consumption (VO₂), which is difficult to measure. The breath by breath method (BBM, Innocor, Innovision, Denmark) for VO₂ measurement is inexpensive and easy to use but has not been validated against the more complex and expensive method of mass spectrometry (MS, Amis 2000, Innovision, Denmark). In this study, we compared the mass spectrometry and the breath by breath method for VO₂ measurement.

Methods

All patients were intubated, mechanically ventilated and studied in the pediatric cardiac intensive care unit. VO₂ of each patient was simultaneously measured with both methods. Once a stable baseline was reached, the values of VO₂ were collected continuously for 10 minutes.

Results

We studied 11 children (5 males, median age 1 years, range 0.2 - 5 years, median weight 11kg, range 2.8 -16.9kg). Mean value of VO₂ measured by MS and BBM was 5.97 ml/kg/min (95% confidence interval, CI 4.98 -6.97) and 5.90 ml/kg/min (95% CI 5.05-6.78), respectively. Analysis of linear regression indicated values of VO₂ measured by MS correlated well with those measured by BBM (R² = 0.73, p<0.001). The mean VO₂ difference between MS and BBM groups was 0.06 ml/kg/min (95% CI -0.45 - 0.58) and not statistically significant (P=0.791). Bland-Altman analysis showed a mean difference of 0.06 and 95% limits of agreement of -1.45 to + 1.58 embraced all the plots.

Conclusions

VO₂ measurements in children after cardiac surgery measured by the MS and BBM correlate well. We conclude that BBM, which is non-invasive, easy to use and inexpensive in comparison to MS, is an accurate alternative method to measure VO₂. The BBM method to measure VO₂ will facilitate the calculation of CO to monitor and tailor therapies accordingly on children after cardiac surgery.

Funded by: WCHRI Trainee Research Grant

Abstract #: 162
 Presenter: Sibasis Daspal
 Preceptor: Sandra Escoredo
 Title: Current practice of car seat safety assessment prior to discharge-a survey in Canadian neonatal units
 Authors: Sibasis Daspal, Lecia Conway, Sandra Escoredo, Georg Schmölder
 Affiliations: U of A

Introduction

Use of car seat has been strongly recommended for any time duration travel in infants and children. Unlike the term infants, small for date or preterm infants are susceptible to compromise their airway and may develop periodic oxygen desaturation and/or bradycardia while being semi-reclined on car seat. A car seat safety assessment has been in use over decades in neonatal units prior to discharge and becoming a mandatory discharge criterion. American Academy of Pediatrics (AAP) and Canadian Paediatric Society (CPS) have published recommendations on car seat safety assessment.

Our aim was to look into current practice of car seat safety assessment in Canadian neonatal units with specific interest to find the practice trend when significant cardio respiratory events notes during first assessment.

Methods

A prospective practice survey from 29 neonatal units identified from Canadian Neonatal Network database. Information collected from clinical nurse educators, charge nurses and discharge planning nurses over telephone using a standard format of questionnaires.

Results

A total 27 units (92%) responded to the questionnaires. Twenty three units (85%) undertake routine car seat assessment on all infants born prior to 37 completed weeks as per their own written guidelines based on AAP recommendations and CPS statements. The standard car seat assessment duration is 90 mins (78% of total units). Eleven units (40%) continue assessment more than ninety minutes if the travel distance from hospital to home is longer. An unsatisfactory assessment leads to repeating the test in most units (96%) although there is variability in the time gap between first and second assessment. Eight units (29.6%) use car bed following unsuccessful car seat safety assessment.

Conclusions

A broad variation in practice was observed when it comes to repeat assessment and its timing. There is a general agreement in lack of straightforward guideline on action following unsuccessful assessment. It is clear that future research is necessary to resolve some of the important issues related to this popular pre-discharge assessment.

Abstract #: 163
 Presenter: Bree Erickson
 Preceptor: Hamdy El-Hakim
 Title: Does the morphological type of laryngomalacia have any diagnostic value?
 Authors: Bree Erickson, Timothy Cooper, Hamdy El-Hakim
 Affiliations: U of A

Introduction

The primary goals were to compare parameters of patients with different types of laryngomalacia (LM) and determine whether the type has prognostic value for surgical outcomes. The secondary objective was to explore if any variable predicts or correlates with the type of LM.

Methods

We conducted a retrospective case series of all LM patients treated with supraglottoplasty (SGP). We included patients with confirmed diagnosis of LM who underwent a cold steel SGP and had complete or ≥ 3 months follow-up, with complete data. Demographics, type of LM, secondary airway lesions (SAL), secondary diagnosis, primary presentation (stridor, snoring / sleep disordered breathing (S-SDB), swallowing dysfunction (SD)), and outcome of SGP were collected. Correlation and multiple regression analysis were performed.

Results

125 children with LM who underwent SGP for LM were identified. 119 were cold steel technique and 8 were repeat procedures. Ninety patients met criteria and were included (mean age 1.46 ± 2.34 [0.04-15.17 years], males:females 1.9:1). The primary presentation was stridor in 66, S-SDB in 14, and SD in 10. Type of LM (T-LM) correlated significantly with age (-0.9), and presentation (0.49). Gender and presence of neurological diagnosis ($p=0.023$ and 0.009) predicted outcome. Presentation and obesity predicted type of LM ($p<0.001$ and 0.048).

Conclusions

Type of LM varies by age and primary presentation. Outcome of management is poorer for males and in the presence of a neurological diagnosis.

Abstract #: 164
 Presenter: Daniela Migliarese
 Preceptor: Justine M. Turner
 Title: How we feel the day of endoscopy: a quantitative comparison of survey responses from parents and pediatric patients undergoing open access versus traditional clinic referral for upper endoscopy.
 Authors: Daniela Migliarese, Rabin Persad, Hien Q. Huynh, Justine M. Turner
 Affiliations: U of A

Introduction

Traditionally patients are referred for endoscopy after a clinic assessment, defined as traditional access endoscopy (TAE). Since 2007, the Stollery Children's Hospital in Edmonton has undertaken open access endoscopy (OAE) for pediatric patients for the diagnosis of Celiac disease (CD). In OAE patients are seen on the day of endoscopy, without prior clinic assessment, in order to reduce the wait time for diagnostic confirmation and hasten the initiation of appropriate treatment. In 2012, the Canadian Association of Gastroenterology linked OAE to decreased patient satisfaction. This study aimed to determine if OAE results in decreased parent and pediatric patient satisfaction compared to TAE.

Methods

Consecutive parents and pediatric patients undergoing upper endoscopy were enrolled, on the day of endoscopy, to complete a survey of 7 pre- and 5 post-procedure questions. These related to patient and parental anxiety, satisfaction with the procedure and wait time, and with information provided. Answers were rated on a Likert scale from 1 to 5. Chi square analysis was used to compare between the responses of parents and children referred for OAE versus TAE.

Results

85 parents completed the survey for 37 children undergoing OAE and 48 children undergoing TAE. 45 children completed the survey, 17 undergoing OAE and 28 undergoing TAE. 86% of children undergoing OAE were for the diagnosis of CD. Indications in the TAE group were: 19% GI discomfort, 17% CD, 17% eosinophilic esophagitis, 4% FTT, 43% undisclosed. Patients in the OAE group reported significantly worse mood pre-procedure than in the TAE group (35% OAE vs 11% TAE, $p=0.046$). Parents and patients in both groups reported more mood disturbance if they had to wait longer for endoscopy by attending clinic pre-procedure (parents: 62% OAE vs 47% TAE, $p=0.16$; patients: 65% OAE vs 52% TAE, $p=0.40$). No difference existed in the proportion of parents pre-procedure who reported being very or extremely worried (16% OAE vs 6% TAE, $p=0.14$); nor who reported being dissatisfied with the information provided (3% OAE vs 4% TAE, $p=0.72$) or dissatisfied with the wait-time for the procedure (11% OAE vs 13% TAE, $p=0.85$).

Conclusions

TAE is associated with better pre-endoscopy patient mood compared to OAE, however parents and pediatric patients are concerned about longer wait times associated with TAE. A tradeoff thus exists between TAE and OAE, and further research to identify methods of minimizing the limitations of OAE will assist in guiding practice.





Abstract #: 165
 Presenter: Tamar Rubin
 Preceptor: Sunita Vohra
 Title: Systematic review of outcome measures in randomised controlled trials of pediatric Eosinophilic Esophagitis (EoE) treatment
 Authors: Tamar Rubin, Jacqueline Clayton, Denise Adams, Rabin Persad, Sunita Vohra
 Affiliations: U of A and AHS

Introduction

Heterogeneity has been noted in the selection and reporting of disease-specific pediatric outcomes in randomized controlled trials (RCTs). The consequence may be invalid results from RCTs, or difficulty in comparing results across trials. The primary objective of this systematic review was to assess the heterogeneity of outcome measures selection and reporting in recent pediatric EoE treatment trials. As secondary objectives, we assessed the heterogeneity of disease definition and resolution across studies compared to established consensus guidelines, as well as the evidence for current EoE treatments.

Methods

We searched MEDLINE, EMBASE, The Cochrane Library, Cochrane Central Register of Controlled Trials (CENTRAL), and CINAHL from the last ten years, including randomized controlled trials of EoE treatment in patients 0-18 years. Two authors independently assessed articles for inclusion. A total of 11 studies met inclusion criteria.

Results

Numerous outcome measures were selected and reported in these trials, with certain measures, such as esophageal eosinophilia, clinical symptoms, safety, histologic features, and endoscopic features, re-occurring frequently, but not universally. The methods and rationale for selecting these measures were only mentioned in one of the papers, and little detail was provided. Uptake of consensus-established diagnostic criteria for EoE (FIGER criteria) was 30% in trials published after 2007. Due to the small number and heterogeneity of studies obtained, no conclusions regarding treatment efficacy could be made.

Conclusions

The results of this study confirm the need for universally reported, pediatric-specific, standardized outcome measures in EoE trials. Adherence to standardized disease definitions will enhance the utility of outcome measures. Consistent disease definition and standardized outcome reporting will allow for meta-analyses across similar trials and thus inform future clinical decision-making in pediatric EoE.

Funded by: WCHRI Trainee Research Grant

Abstract #: 166
 Presenter: Heather Dreise
 Preceptor: Kellie Waters
 Title: Children entering foster care: evaluation of growth parameters as surrogate marker of general health
 Authors: Heather Dreise, Kellie Waters, Tami Masterson, Donald Spady
 Affiliations: U of A

Introduction

Many experts including the CPS and the AAP have suggested that children who are coming into foster care have unique health concerns that require close follow up and coordination of special services. In spite of their being approximately 76,000 children in care in 2000 there is very little data to support these statements. It has been shown in multiple studies from the US that children entering foster care when "compared with children from the same socioeconomic background, have much higher rates of serious emotional and behavioral problems, chronic physical disabilities, birth defects, developmental delays, and poor school achievement." The Canadian Association of Community Living estimates that more than 60% of children in care have some form of disability.

Methods

In this retrospective chart review the gender, age, weight, height, head circumference and body mass index at the time of apprehension for children apprehended between July 2011 to July 2012 seen in one clinic, will be reviewed. Included charts had the date of apprehension indicated and assessment occurred within 6 months of apprehension. Assessment also had to include record of age, gender, ht, wt and hc. Percentiles and Z-scores were recorded from WHO growth standards for ht, wt, BMI and HC.

Results

A total of 96 cases were included. Weight and BMI Z-scores were significantly different than WHO distribution. Mean weight Z-score was 0.464, mean BMI was 0.641. Subgroup analysis showed that females had significant increases in both weight and BMI while males had significant increase in weight and borderline increase in BMI. Regression analysis of the data it showed that age is a significant factor in predicting Z-score for weight, but gender did not make a significant difference. Both age and gender were significant factors in predicting the Z-score for BMI.

Conclusions

In our cohort the children entering foster care had statistically increased BMI and weight. It remains unclear if the children entering foster care have a statistically different weight and BMI than the average Canadian child. Our control group of the WHO growth curves was children who were breast fed and considered to have ideal growth across many nationalities. A study of Canadian children who are not in foster care is needed to evaluate if our data is significantly different from the Canadian norm. Ultimately the question of the health status of children entering foster care remains unanswered and requires further exploration before optimal medical care can be provided.

Abstract #: 167
 Presenter: Vivian Biancardi
 Supervisor: Luciane Gargaglioni
 Title: Respiratory pattern of newborn male rats (P6) exposed to fluoxetine during prenatal period
 Authors: Vivian Biancardi, Luis Gustavo Patrone, Kênia Cardoso Bicego, Luciane H. Gargaglioni
 Affiliations: U of A/Sao Paulo State University

Introduction

Selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine are generally prescribed as antidepressants. Fluoxetine administration during pregnancy, however, may be a risk factor for cardiorespiratory disease in the human fetus leading to persistent pulmonary hypertension (Chambers et al., 2006). Serotonin (5-HT) is a neurotransmitter that is involved in a host of maturational processes in the fetal and postnatal nervous system. It also has widespread modulatory actions including the modulation of respiratory rhythm via 5-HT_{1A} and 5-HT_{2A} receptors on respiratory neurons that contribute to hypercapnic and hypoxic ventilatory responses. The goal of the present study was to evaluate the effects on the respiratory control system of newborn rats of SSRI exposure during a critical prenatal period of development when respiratory networks first become functional.

Methods

To this end, pregnant female rats received via oral gavage vehicle (apyrogenic sterile saline + 0.2% Tween-80) or fluoxetine (10mg/kg) from the 15th day of gestation and the ventilation of male pups was studied at postnatal day 6 (P6). The control and SSRI groups were from mothers that received saline or fluoxetine during pregnancy, respectively. We measured respiratory frequency (fR), tidal volume (VT) and minute ventilation (VE) using head-out plethysmography. Measurements were made during a 60 min exposure to room air followed by 60 min exposure to 7% CO₂ (hypercapnia) or 10% O₂ (hypoxia). Pups then recovered for 60 min in normocapnic/normoxic conditions and were then exposed for 60 min to either 10% O₂ or 7% CO₂.

Results

Hypercapnia induced a greater increase in fR in the SSRI compared to the control group (10 min: $97.4 \pm 4.4\%$ (of baseline) for control compared to $110.1 \pm 0.7\%$ for SSRI group; 30 min: $101.0 \pm 5.5\%$ for control vs $113.3 \pm 2.6\%$ for the SSRI group, $P < 0.05$). The ventilatory response to hypoxia was attenuated in the SSRI group (10 min: VT was $141.0 \pm 8.3\%$ in control and $108 \pm 11\%$ in the SSRI group, $P < 0.05$).

Conclusions

These preliminary data suggest that SSRI administration during prenatal development increases CO₂ chemosensitivity but decreases O₂ chemosensitivity.

Funded by: CNPq and FAPESP

Abstract #: 168
 Presenter: Alex Cojocar
 Title: Luminal flushing of intestinal specimens with an amino acid solution during cold storage to minimize mucosal injury and improve transplant outcomes

Intestinal failure is a life-threatening condition in which the digestive and absorptive abilities of the small intestine are compromised, leading to malnutrition and death. The first treatment modality is total parenteral nutrition (TPN), the intravenous administration of the calories, biomolecules, vitamins, and ions that meet the body's nutritional needs. TPN is rarely viable in the long term; patients are prone to developing associated liver disease, hematogenous infections, and more. When TPN is no longer an option, the last resort is a small bowel transplant (SBTx). Regrettably, the largest group requiring intestinal transplants is children 1-5 years old. The most common causes are congenital abnormalities such as gastroschisis (malformation of the abdominal wall) and volvulus (abnormal intestinal torsion), which have a major impact on the child's physical and emotional health, as well as that of their family. Further, the long term outcomes for SBTx are worse than for any other organ transplant. The intestinal mucosa's vulnerability to ischemia, the intestine's many colonies of resident bacteria, and the fact that the small bowel is a sizeable focus of immunological activity are three factors facilitating the development of necrosis/apoptosis, bacterial infection, and acute cellular rejection, respectively. We propose a logical step to ameliorating these three considerations is to support the metabolic needs of the mucosa during cold storage as it is transplanted from one body into another. Our lab has developed an organ-specific preservation solution that is rich in amino acids, antioxidants, and osmotic agents. This preservation solution has been tailored to the physiologic requirements of the small bowel and has been shown to be effective in several models of organ storage or ischemia-reperfusion. Flushing it luminally throughout the cold storage phase, we have pioneered a novel approach to preserving the intestine and keeping it healthier – and therefore less prone to necrosis/infection/rejection – by the time it is implanted into the recipient.





Abstract #: 169
 Presenter: Amanda Chan
 Supervisor: Edmond Lou
 Title: A reliability study of a computer-assisted method to measure the Cobb angle, vertebral rotation and spinous process angle for AIS
 Authors: Amanda Chan, Devlin Morrison, Doug Hill, Edmond Lou
 Affiliations: U of A

Introduction

Adolescent Idiopathic Scoliosis (AIS) is a three-dimensional spinal deformity with both lateral curvature and vertebral rotation. The Cobb angle and vertebral rotation (VR) measured from posteroanterior (PA) radiographs are the primary parameters used to quantify the severity of scoliosis, assist with treatment decisions, and evaluate treatment outcomes. The spinous process angle (SPA) was proposed to assess scoliosis in the past and claimed to provide a better indicator of posterior spinal deformity compared to the Cobb angle. However, the SPA has not been used widely due to the unreliability of identifying the spinous process from radiographs. As digital radiography is common today, a computer-assisted method has been developed to measure the Cobb, VR and SPA in a single software platform. The purpose of this study was to determine the intra- and inter-observer reliability of the Cobb angle, VR and SPA using the developed semi-automated method.

Methods

A retrospective study of 60 PA radiographs of AIS, obtained from the Edmonton scoliosis clinic, was performed. Three observers with different experiences in scoliosis measured the radiographs twice, 1 week apart, to minimize memory bias. With the development of the semi-automated measurement method, the variability of measurements was minimized. The intra- and inter-observer reliabilities were analyzed using intraclass correlation coefficients (ICC) as well as Bland-Altman's bias and limits of agreement.

Results

In total, over 350 (intra) and 90 (inter) sets of curves were compared for each parameter. The intra- and inter-observer reliabilities for the parameters (Cobb, VR and SPA) were (0.98, 0.95 and 0.91), and (0.94, 0.87 and 0.79), respectively. The combined mean absolute difference (degrees) of the intra-, and inter-measurements between parameters (Cobb, VR, SPA) were (1.2 ± 1.3 , 1.9 ± 2.1 , and 2.4 ± 2.8) and (2.2 ± 1.9 , 3.2 ± 3.1 , and 4.7 ± 3.6), respectively.

Conclusions

From the results, the Cobb angle is still the most reliable method and the SPA is the least. The computer-assisted method demonstrated that the Cobb and VR measurements are fairly reliable and in the clinically-acceptable range ($< 5^\circ$). However, the SPA was less accurate and may require improvement before it can be considered for clinical implementation.

Funded by: Alberta Innovates Health Solutions and the Women's and Children's Health Research Institute

Abstract #: 170
 Presenter: Chelsey Grimbly
 Preceptor: Mary Jetha
 Title: A case report of congenital hyperinsulinism where genetic testing was incongruent with imaging
 Authors: Chelsey Grimbly, Robert Couch, Bryan Dicken, Andrea Haqq, Elizabeth Rosolowsky, Mary Jetha
 Affiliations: U of A

Introduction

Congenital hyperinsulinism is a rare cause of nonketotic hypoglycemia in the neonatal and infant population. Lesions in the pancreas can be focal or diffuse and identifying the specific mutation is helpful in management. We present a case of medically unresponsive congenital hyperinsulinism due to a focal lesion. Imaging was somewhat misleading while genetic testing confirmed diagnosis and surgery was curative.

A term male infant (birth weight 3.43 kg, 0 SD) presented with seizure and severe hypoglycemia (0.6 mmol/L) on day two of life. A septic workup was negative and hypoglycemia resolved during hospitalization. The patient was discharged home on routine feeding. At 15 weeks of age (weight 7 kg, $>3SD$), seizures recurred after short periods of fasting.

Methods

A critical sample revealed hyperinsulinemic hypoglycemia. 18Fluoro dihydroxyphenylalanine positron emission tomography (18F DOPA PET) scan showed intense tracer uptake in 2 focal areas in the pancreatic head and body. Genetic sequencing showed a heterozygous paternally inherited frameshift mutation in the KCNJ11 gene (c.240delG), previously unreported.

Results

Hypoglycemia was refractory to diazoxide and octreotide. Pediatric Surgery was consulted and a solitary 2 cm lesion was resected from the pancreatic body and no other lesion was visible on inspection or intraoperative ultrasound. Postoperatively, glucose remained stable on intermittent oral feeding, without medications or dextrose.

Conclusions

This case highlights investigations and interventions for congenital hyperinsulinism refractory to medical management. Surgery provides definitive diagnosis but procedural planning is contingent upon focal or diffuse disease. 18F DOPA PET scan suggested the presence of a second lesion, possibly due to artifact from the large body lesion. Genetic testing and surgery were consistent with focal disease and excision of a single lesion was curative.

Abstract #: 171
 Presenter: Nese Yuksel
 Supervisor:
 Title: Knowledge, attitudes and beliefs regarding calcium and vitamin D in a sample of middle-aged women
 Authors: Nese Yuksel, Cheryl Sadowski
 Affiliations: U of A

Introduction

Adequate calcium and vitamin D is important for maintaining bone health. To promote calcium and vitamin D intake it is important to understand the knowledge, attitudes and beliefs of the general public. The primary objective is to describe the knowledge, attitudes and beliefs regarding calcium and vitamin D in middle-aged women. This study is part of a larger trial assessing calcium and vitamin D knowledge, attitudes and beliefs in different populations.

Methods

This was a cross-sectional survey. A 70-item written, self-administered questionnaire was developed with 6 sections consisting of demographics and questions regarding intake, knowledge, attitudes, and beliefs regarding calcium and vitamin D. A convenience sample of women between the ages of 35 to 64 years of age were recruited by a research assistant at several pharmacies and community centers in Edmonton and surrounding areas from October 2011 – March 2012. Ethics approval was received from the University of Alberta Health Research Ethics Board. Summary statistics was used for analysis.

Results

A total of 84 women with the median age of 50 (35 – 64 years), completed the survey. The sample was mostly white (92%) and had completed some form of post-secondary education (73%). In total 13% had been told they had osteoporosis. The majority of respondents agreed that getting enough calcium and vitamin D was important to them (92% and 88% respectively). More women were taking a vitamin D supplement (69%), as compared to calcium supplements (46%). Of the women no longer taking calcium (47%) and vitamin D (19%), supplements, the most common reason for discontinuing was difficulty fitting into life style. Overall 28% were unsure of the required calcium amounts for women, and this was consistent for vitamin D (26%). Only 27% agreed that they find it easy to eat enough foods that are high in calcium each day, while 17% agreed for vitamin D. A quarter of the respondents were concerned about the safety of calcium supplementation (23%), while this concern was less with vitamin D (13%).

Conclusions

Overall, middle aged women had a positive attitude towards calcium and vitamin D intake, and were able to identify some common food sources for these nutrients. However, nearly a third of women were unaware of the daily calcium and vitamin D requirements. Health care professionals should discuss patient beliefs about calcium and vitamin D and provide targeted education around these beliefs.

Abstract #: 172
 Presenter: Andrea L. Chambers
 Supervisor: Troy W.S. Turner
 Title: Pre-hospital and emergency room management of pediatric anaphylaxis
 Authors: Andrea L. Chambers, Troy W.S. Turner
 Affiliations: U of A

Introduction

Anaphylaxis is a severe allergic reaction, in which symptoms progress quickly and lead to serious complications, including death. Epinephrine is effective treatment for anaphylaxis, and earlier delivery of epinephrine leads to better patient outcomes. By having access to an epinephrine auto-injector, a caregiver or patient can administer this life-saving medication prior to arrival at hospital. However, it is unknown if caregivers, patients and emergency health care providers use epinephrine when indicated. This retrospective study will assess the rates of epinephrine administration for pediatric anaphylaxis prior to arrival in hospital and in the emergency department.

Methods

This retrospective, cross-sectional, descriptive study will assess patients who presented to the Stollery Children's Hospital Emergency Department during a five-year period (2005 – 2010). Charts coded as anaphylactic reaction (any type) will be reviewed, and children aged 0 to 17 will be eligible. Data will be collected on a standardized form, and will include clinical variables, treatment received both pre-hospital and in the emergency department, and patient outcomes. A minimum of 125 charts will be analyzed to detect a minimum difference of 0.1244 in hospital admission rates. Numerical and graphical summaries will be used to report the data, and categorical variables will be compared using chi-square or Fisher's exact test. The University of Alberta's Health Research Ethics Board approved this study prior to initiation.

Funded by: WCHRI Resident Trainee grant





Abstract #: 173
 Presenter: Frank Fan
 Supervisor: Richard Schulz
 Title: Oncostatin-M induced cardiomyocyte dedifferentiation involves proteolytic actions of Matrix metalloproteinase-2
 Authors: Frank Fan, Bryan Hughes, Mohammad Ali, Richard Schulz
 Affiliations: U of A

Introduction

Despite the dogma that the adult mammalian cardiomyocyte is terminally differentiated, these cells have a discrete regenerative capacity in both acutely and chronically injured human hearts. Dedifferentiation of cardiomyocytes is an important source of cardiac progenitor cells facilitating cardiac repair. Cardiomyocyte dedifferentiation induced by oncostatin-M (OSM) is characterized by progressive sarcomere degeneration. However, the detailed mechanism regarding the execution of sarcomere degeneration remains unclear. Matrix metalloproteinase-2 (MMP-2) is a key intracellular protease which is abundantly expressed in cardiac myocytes. It is an integral sarcomeric protein proteolyzes specific sarcomeric and cytoskeletal proteins in response to oxidative stress. We hypothesized that MMP-2 may be involved in cardiomyocyte dedifferentiation induced by OSM.

Methods

We performed a series of confocal immunofluorescence and biochemical studies to explore the role of intracellular MMP-2 in sarcomere degeneration in OSM-induced dedifferentiation of neonatal rat ventricular myocytes (NRVM)

Results

OSM (50 ng/ml, 96 hr) caused a significant loss of sarcomeric α -actinin and titin. The organized striations of the sarcomere changed to a pattern which resembles a less developed sarcomere, e.g. Z-disks transformed into Z-bodies usually found in immature myofibrils. Both OSM-induced sarcomere degeneration and disassembly during mitosis lead to impaired sarcomere integrity, characterized by a loss of organized striations, however, morphological observation suggest they are unique processes. OSM-induced dedifferentiation did not appear to reduce cell viability nor impaired their entry into the cell cycle but instead enhanced their proliferation. Western blot and gelatin zymography analysis showed increased MMP-2 activity and loss of α -actinin and troponin I following OSM treatment. The selective MMP-2 inhibitor (ARP-100) or pan-MMP inhibitors (GM6001 or ONO-4817) blocked degeneration of both sarcomeric α -actinin and titin induced by OSM treatment

Conclusions

These results suggest the involvement of MMP-2 in cardiomyocyte dedifferentiation stimulated by OSM. Loss and disorganization of sarcomeric proteins in OSM treated NRVM may be attributed to the activation of intracellular MMP-2.

Abstract #: 174
 Presenter: Sibasis Daspal
 Supervisor: Georg Schmölzer
 Title: Endotracheal tube suctioning and lung recruitment practice-an observation in NICU
 Authors: Sibasis Daspal, Georg Schmölzer, Ann Hudson-Mason, Po-Yin Cheung
 Affiliations: University of Alberta

Introduction

Loss of lung volume (lung de-recruitment) in ventilated infants has been observed in NICU as most of the endotracheal tubes are non-cuffed. Although closed ventilator circuit has been designed to prevent this, lung de-recruitment post ET suction has been well documented. In our NICU (Royal Alexandra Hospital, Edmonton), lung recruitment following ET suction is not a routine practice although in certain clinical cases, lung recruitment has been undertaken if there is persistent oxygen desaturation. As most of our infants are ventilated on volume guarantee (VG), we have been using higher tidal volume (V_t) for brief period of time to recruit lung. In most cases this was performed by extra 1-2 ml of V_t over 2-3 mins period (volume recruitment).

Objective: We aim to look at the incidence of loss of lung volume post ET suction and its natural course comparing with the volume recruitment.

Methods

A prospective data collection on pulmonary graphics and vital signs pre and post ET suction with or without volume recruitment maneuver over a time period. One hour epoch prior to ET suction was used as baseline value and compared with one hour post ET suction epoch. We considered decrease in dynamic lung compliance (C_{dyn}) by 10% from baseline value along with increase in peak inspiratory pressure (PIP) as marker of loss of lung volume post ET suction. Successful recruitment was defined by improvement of the above mentioned pulmonary mechanics back to baseline values. Besides these, we also reviewed the trend of minute ventilation spontaneous% (MV-spont%), V_t , FiO₂ and recent chest radiograph for lung volume. All pulmonary graphics were recorded in memory sticks and subsequently reviewed on later date.

Results

Total 60 ET suction events were observed and analysed (30 events without volume recruitment and 30 events with volume recruitment). In our population average PEEP used was higher than usual (8cm). In total 62% ET suction events were associated with loss of lung volume. There was no difference noted on lung recruitment between volume recruitment Vs no recruitment group (volume recruitment-10/30 Vs no recruitment-14/30). Among other parameters, volume recruitment group had more infants who showed better spontaneous respiratory pattern at the end of recruitment maneuver (19 Vs 13). The end-tidal carbon-dioxide (EtCO₂) remained within normal range in both groups (Median 62.5 mm Hg). No air leak syndrome was recorded in any of the study infants.

Conclusions

Although reasonable number of infants lost their lung volume post ET suction, considerable number of infants recruited themselves without any help. In our study group, volume recruitment method did not prove to be beneficial.

Abstract #: 175
 Presenter: P. Bobhate
 Preceptor: I. Adata
 Title: Cardiac Catheterization in Children with Pulmonary Hypertension
 Authors: Bobhate P, Long G, Jain S, Cave D, Haugen R, Rutledge J, Coe JY, Adata I.
 Affiliations: U of A

Introduction

Cardiac catheterization of children with pulmonary artery hypertension (PAH) is essential for diagnosis, assessment of disease progression, therapeutic decision making and approval for PAH drug benefits. Reliance on hemodynamic data is important in children because we lack validated disease markers that are reproducible, readily applicable to patients of all sizes, ages and developmental ability. However, death or need for resuscitation has been reported to occur in 5-6% of cases.

Methods

In 2009 we changed the protocol for children with PAH undergoing cardiac catheterization with precatheterization discussion with anesthesia, administration of 1mg/kg sildenafil 20 minutes prior to endotracheal extubation, continuation of outpatient PAH therapy and a standardised anesthetic protocol. Records of all children with PAH undergoing cardiac catheterization from January 2009 to April 2013 were reviewed. Adverse events occurring up to 48 hours after cardiac catheterization were noted.

Results

56 patients (32 M), median age 4 years (0.25 to 17), weight 13.9 kg (3.3 to 77) underwent 76 cardiac catheterization procedures. Diagnoses were idiopathic PAH (28%), PAH due to heart disease (58%) and lung disease (13%). Mean PA pressure was 43 ± 18 mm Hg; mean pulmonary vascular resistance was 9.6 ± 6 Woods units.m². Transient loss of foot pulse occurred in 3 patients (4.3% of procedures). Serious adverse events occurred in 2 patients (2.6%) both with idiopathic PAH, suprasystemic PA pressures and decreased right ventricular function. One patient required inotropic support and intensive care admission overnight. One patient required initiation of mechanical extracorporeal life support (ECLS) 36 hours after the procedure for refractory progressive right heart failure and later underwent successful lung transplantation. There were no deaths.

Conclusions

Serious adverse events occur in 2.6% of patients with PH within 48 hours of cardiac catheterization and suggests that cardiac catheterization in children can be accomplished with acceptable risk:benefit ratio. Close collaboration with pediatric anaesthesia, a standardised approach and the use of sildenafil before the end of the procedure may have contributed to the decreased frequency of adverse events reported by other centers. Patients with IPAH and suprasystemic PA pressures are most at risk for adverse events. Availability of ECLS for patients in right heart failure is prudent.

Abstract #: 176
 Presenter: Shanon Phelan
 Supervisor:
 Title: Re-framing school-based practice: a case example
 Authors: Stella Ng, Shanon Phelan
 Affiliations: U of A

Introduction

School-based practice is a context that invokes collaboration between families, education professionals, and health professionals on interprofessional healthcare teams. This collaboration is mediated, explicitly and implicitly, by policies, protocols, and professional discourses. It is well established in the literature that school-based practice is fraught with barriers to successful collaborative efforts, which can negatively impact children with disabilities in their school environments. The objective of this research was to examine the hidden influences that shape health professional practice in the school-based context (intersections of both the health and education systems) and to question the implications of their effects.

Methods

Case study (Stake, 1995) approach was utilized. Methods included observation of school support team meetings, shadowing of families, document collection, and formal/informal interviews with families, healthcare, and education professionals. As an example, Jill's case will be presented and explored in-depth. This case was derived from a program of research shared by the authors, with potentially identifying details changed to protect anonymity and privacy. A critical social theory perspective (Crotty, 2007; Eakin, Robertson, Poland, Coburn, & Edwards, 1996; Simon, 1992) informed the analysis, which proceeded iteratively in three main steps: local-level analysis (i.e. clinical assessments, interview data, observation notes, team meetings at schools), high-level analysis (individual education plan policies, DSM-IV diagnostic criteria, community health provision policies), and integrated analysis (integration of both local-level and high level analyses to illuminate how school-based practices may be influenced by social and political forces).

Results

Three re-framings of school-based practices were generated: 1) supporting parents' work by recognizing the potential pitfalls of proxy practice, 2) school-based practice mediated by texts, and 3) school-based practice constructing good and bad parents.

Conclusions

This study illuminates the shaping power of texts and discourses on practice and the contexts in which children with disabilities develop. By re-framing school-based practice, we may be able to re-envision special education with renewed agency to support children optimally, in light of discursive influences on professional practice.





Abstract #: 177
 Presenter: Alan Richter
 Supervisor: Eric Parent
 Title: Ultrasound image measurements of erector spinae muscle thickness at 4 spinal levels in adolescents with Idiopathic Scoliosis: reliability and concave--- convex comparison
 Authors: Richter, Alan; Parent, Eric C.; Kawchuk, Gregory; Moreau, Marc; Hedden, Douglas; Lou, Edmond
 Affiliation: U of A

Introduction

Muscular characteristics in scoliosis are insufficiently documented. Ultrasound imaging measurements of extensor muscle thickness are used commonly in low back pain (LBP) but not in scoliosis. These measures may inform exercise prescription in adolescent idiopathic scoliosis (AIS).

The aim was 1) to determine the intra---rater reliability of erector spinae ultrasound thickness measurements at different spinal levels, and 2) to determine concave---convex differences in erector spinae thickness in AIS.

Methods

Nine patients with AIS with a single thoracic curve, aged 13.5±1.8 years old, with mean Cobb angles of 39.4±9.1o, under observation or wearing a brace were included. In prone position, three ultrasound images of erector thickness were obtained on each side at L3, the upper end---vertebra, lower end--- vertebra and the apex of the curve in random order. A 5cm curvilinear probe was used to capture images of the erectors parasagittally over the facets. Thickness was measured as the distance from the facet to the first fascia line by an examiner blinded to image location and measurements. Reliability was estimated using Intraclass correlation coefficients (ICC_{2,1} and ICC_{2,2}) and standard error of measurement (SEM). Differences between sides were determined using paired t---tests at each level.

Results

The intrarater ICC_(2,1)s for a single measurement varied between 0.75 and 0.99. The ICC_(2,2)s corresponding to the average of the most similar 2 out of 3 measurements varied between 0.86 and 0.99 depending on levels. The corresponding SEM for these average measurements varied between 0.03 and 0.17cm (mean 0.09) depending on sides and levels with no systematic pattern.

The only statistically significant difference between sides was observed at the upper end---vertebra (concave <convex 0.23±0.22cm). Mean extensor thickness was 1.75±0.30cm and 1.98±0.34cm at the left and right upper end---vertebra level, respectively. Mean thickness was 2.33±0.11, 2.18±0.14, and 2.57±0.12cm at the apex, lower end---vertebra and L3, respectively.

Conclusions

Adequate intrarater reliability for research was obtained by averaging the most similar 2 of 3 erector spinae thickness measurements. Reliability was similar at all spinal levels and consistent with results in LBP.

Abstract #: 178
 Presenter: Chengsheng Wu
 Supervisor: Raymond Lai
 Title: The biological function of Stat1 in ALK positive anaplastic large cell lymphoma
 Authors: Chengsheng Wu, Raymond Lai
 Affiliations: U of A

Introduction

Although it has been suggested that STAT1 can induce apoptosis and antagonize the oncogenic effects of Stat3 in mutant fibrosarcoma cell lines, the tumor suppressor role of Stat1 via Stat3 inhibition in normal cancer cells is not fully understood. Using anaplastic lymphoma kinase-positive anaplastic large cell lymphoma (ALK+ALCL), a cell type characterized by a high level of constitutive activation of Stat3, we studied the tumor suppressor function of Stat1, with a focus on its inhibiting Stat3.

Methods

Total and activated Stat1 were detected in two ALK+ ALCL cell lines, SupM2 and Karpas 299, and 15 patient samples. We established Tet on-inducible stable SupM2 and Karpas 299 cell lines with expression of constitutively activated Stat1 (Stat1C), then effects of Stat1C on cell viability and tumorigenicity via methylcellulose colony formation assay were measured. Meanwhile, the Stat3 activity influenced by Stat1C were detected via co-immunoprecipitation, Stat3 DNA probe binding assay and dual luciferase assay. Furthermore, cell viability were tested after treatment of Stat3 specific inhibitors in ALK+ ALCL with Stat1 knock-down via siRNA.

Results

Relatively low level of Stat1 and phosphorylated Stat1 were found in both two ALK+ALCL cell lines and 15 tumor samples compared to normal T cells. In the two stable cell lines, we showed that enforced expression of Stat1C induces the apoptosis of ALK+ALCL cells and decreases methylcellulose colony formation in soft agar in a dose-dependent manner. Meanwhile, we demonstrated increasing expression of Stat1C gradually increased Stat1:Stat3 heterodimers, at the expense of Stat3 homodimers, and decreased Stat3 DNA binding ability. In order to further examine the functional interaction between Stat1 and Stat3, we found Stat3 sequesters Stat1 in the form of Stat1/Stat3 heterodimers and prevents it from being activated in ALK+ALCL. Inhibition Stat3 by Stat3 specific inhibitors or siRNA leads activation of Stat1 in ALK+ALCL. Moreover, knocking down Stat1 via siRNA conferred resistance to Stat3 inhibition induced ALK+ALCL cell death.

Conclusions

Inhibiting Stat3-induced cell death in ALK+ALCL is partly dependent on Stat1 pathway. Our data also suggests enhancement of Stat1 function might be a novel therapeutic approach for cancer that influenced by a high level of constitutively activated Stat3.

Abstract #: 179
 Presenter: Rachel King
 Supervisor: Denise Larsen
 Title: Exploring hope in early adolescent girls through photos and conversations
 Authors: Rachel King, Denise Larsen
 Affiliations: U of A

Introduction

Early adolescence is often described as a time of uncertainty. Hope is consistently demonstrated to be a protective factor for early adolescents struggling with the challenges of development. Higher hope is related to a host of positive outcomes, and is linked with maintenance of hope well into adulthood. However, while girls enter the period of early adolescence with higher hope than their male counterparts and their hope steadily decreases until they transition into adolescence proper with lower hope than boys of the same age. Qualitative research on hope throughout development is sparse. Most research on hope in early adolescence simply applies adult understandings of hope to an adolescent context. This research sought to describe the experience of hope for early adolescent girls, using the youth themselves as our best tool for understanding their experience.

Methods

In this research, I employed basic interpretive inquiry, a qualitative methodology rooted in interpretivism and aimed at providing rich description of themes common to all participants, while still contextualized to the participants' circumstances. I conducted four in-depth interviews with girls between the ages of 13 and 15, based in part on photos the participants took of images that were hopeful to them. Interviews were transcribed and coded for the research question.

Results

Four main themes emerged through analysis: (a) experiential hope, (b) relational hope, (c) hope and identity, and (4) hope threatened; hope renewed. The participant's portrayals of hope suggest that while hope is significantly threatened for girls in early adolescence, hope continues to manifest despite these threats while changing in form. Hope was meaningfully related to the participants' sense of self and the participants all sought multiple sources for their hope.

Conclusions

The findings depict hope for early adolescent girls as unique from previous findings of adult conceptualizations of hope, with elements of similarity. Implications for research and practice following from the findings are discussed.

Abstract #: 180
 Presenter: Tatiana Miguel
 Supervisor: Kathy Hegadoren
 Title: Women's patterns of primary care utilization in Brazil
 Authors: Tatiana Miguel, Adriana Inocenti Miasso, Kathy Hegadoren
 Affiliations: U of A

Introduction

The demand for mental health care for common mental health disorders within Primary Care has steadily increased as psychiatric services focus more on the more serious mental health problems. Despite this increased demand, there is little consistency regarding practice guidelines or policies in terms of assessment of mental health symptoms across Primary Care practice settings. The objective of this study is to examine the number of mood, anxiety and somatic symptoms in women presenting to five primary care units in an urban center in Brazil and the potential impact of those symptoms on quality of life. A secondary objective was to investigate the fit between women's reports on their health and medication history and the health record.

Methods

Data collection included demographic information, medication history, the SRQ-20 (a self-report related to mood, anxiety and somatic symptoms developed by the WHO) and a quality of life measure (WHOQOL-Brief). The health records were also examined for medication history, diagnoses of mood or anxiety disorders and other health conditions.

Results

A significant proportion of the women (N=365) reported high numbers of mood and anxiety symptoms; however they did not endorse these as the reason for the visit. Indeed, the 3 most common reasons were: prescription refills, abdominal pain and ante- and post-partum care. Antidepressant use was common, but there was little evidence of a diagnosis of a mood or anxiety disorder documented in the health record.

Conclusions

The data highlights the need for a time-sensitive standardized psychosocial assessment for women accessing Primary Care to allow women an opportunity to disclose symptoms and to allow health professionals to respond to common mental health disorders.



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