Asthma is one of the most common childhood conditions with a prevalence of approximately 10% globally. In Canada, childhood asthma prevalence is around 13% and is a leading medical expense costing hundreds of millions of dollars. Internationally, childhood asthma is typically higher in Westernized nations, including Canada, compared to other regions. Within Canada, regional variation in asthma and related symptom prevalence has been reported. In addition to this, there has been some evidence that the prevalence of asthma and allergy are lower in rural or farming regions compared to urban or non-farming areas. Reasons for this geographic variation are unknown but may include environmental differences, accessing or labeling differences where children may not be accessing the health care system or physicians may be labeling a condition as something other than asthma, or differences in health behaviours.

Within Saskatchewan, much of the research into the geographic variation of childhood asthma has focused on differences in asthma prevalence between farming and non-farming regions compared to urban or non-farming areas. Reasons for this geographic variation are unknown but may include environmental differences, accessing or labeling differences where children may not be accessing the health care system or physicians may be labeling a condition as something other than asthma, or differences in health behaviours.

When the issue of variability was addressed through the inclusion of a larger range of dwelling locations (i.e. large urban through rural farming), a gradient in asthma prevalence was observed nationally (Lawson et al, 2011). Few explanations for the differences in prevalence could be considered nationally as this was a survey where lung health was not the primary focus although conclusions from the study were that health behaviours were likely not explaining the differences but that access or labeling issues may play a role given that there was no difference along an urban-rural gradient in the prevalence of wheeze or health care utilization.

To expand on these results, a study is currently underway in Saskatchewan, which

continued on P3...
Dr. Roona Sinha is an Associate Professor in the Department of Pediatrics, College of Medicine, University of Saskatchewan. She is also a qualitative researcher. Past qualitative studies have included looking at health related quality of life in pediatric oncology patients as well as examining the efficacy of using written hematology patient education materials to enhance the clinic visit experience. Her qualitative research interests combined with her interests in medical education led her to recently complete a Masters of Health Professions Education through Maastricht University in the Netherlands. In her thesis research project, she examined the challenges faced by physicians at the time of transition to practice and why these challenges exist. Novel findings were observed with respect to the culture of medical training and practice in Canada as well as implications to help ease the process of transition to practice for future physicians. Stemming from this project she is now collaborating on an international study looking at cultural differences during the transition to practice period for physicians in different countries.

Dr. Sinha is interested in clinical research using both qualitative and quantitative methodology that brings together collaborators from different fields to explore new ideas that can further the health of children. She can be contacted at roona.sinha@usask.ca.

Dr. Richard Huntsman presented their unique observation of the efficacy of dimenhydrinate for treating PTU at the Canadian Neurological Sciences Federation Congress in Toronto in June, 2015. The investigators have established a collaboration with colleagues at the University of Alberta to further investigate the clinical efficacy of using low dose dimenhydrinate to treat PTU.

Katherine Sawicka, a medical student, in association with Dr. Richard Huntsman is an Associate Professor in the Department of Pediatrics, College of Medicine, University of Saskatchewan.

Paroxysmal Tonic Upgaze (PTU) of infancy is an uncommon benign syndrome of childhood and infancy characterized by sustained episodes of conjugate upward deviation of the eyes. This is accompanied by neck flexion to compensate for abnormal eye positioning. The pathophysiology of PTU remains obscure. PTU often resolves spontaneously over several months, however episodes are extremely debilitating. While PTU is associated with normal neurodevelopmental outcomes in 50% of cases, it can be associated with protracted ataxia and cognitive deficits. Currently, treatments with levodopa have been tried with variable success. Via its anticholinergic effects, we postulated that dimenhydrinate may be a novel and effective therapeutic option in children with paroxysmal movement disorders, such as PTU, with limited side effects.

Katherine Sawicka and Dr. Richard Huntsman

Successful treatment of paroxysmal tonic upgaze with low dose dimenhydrinate (Gravol®)

Paroxysmal Tonic Upgaze (PTU) of infancy is an uncommon benign syndrome of childhood and infancy characterized by sustained episodes of conjugate upward deviation of the eyes. This is accompanied by neck flexion to compensate for abnormal eye positioning. The pathophysiology of PTU remains obscure. PTU often resolves spontaneously over several months, however episodes are extremely debilitating. While PTU is associated with normal neurodevelopmental outcomes in 50% of cases, it can be associated with protracted ataxia and cognitive deficits. Currently, treatments with levodopa have been tried with variable success. Via its anticholinergic effects, we postulated that dimenhydrinate may be a novel and effective therapeutic option in children with paroxysmal movement disorders, such as PTU, with limited side effects.

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Katherine Sawicka is a Phase C medical student in the College of Medicine, University of Saskatchewan. Dr. Richard Huntsman is an Associate Professor in the Department of Pediatrics, College of Medicine, University of Saskatchewan.

**Featured Child Health Researcher**

**Dr. Roona Sinha**

Dr. Roona Sinha is a pediatric hematologist oncologist who joined the University of Saskatchewan faculty in January 2012. She completed her undergraduate and medical school studies at the University of Ottawa. This was followed by a pediatrics residency at the University of Alberta and then fellowship training in pediatric hematology oncology at the University of British Columbia.

Dr. Sinha is the local principal investigator for several national trials in the area of pediatric hematology. These include treatment studies in hemophilia, surveillance of treatment effects in bleeding disorders, examining the genetic basis of bone marrow failure disorders, and looking at next generation sequencing to identify genetic predispositions that affect treatment in aplastic anemia and myelodysplastic syndromes. In the area of pediatric oncology, she is an active member of the Children's Oncology Group which is an international clinical trials group that examines the biology of cancer, new treatments, and supportive care in pediatric oncology patients. Through her work on the executive of the C17, which is the national hematology oncology organization, she is also looking at ways to increase access to clinical trials for pediatric hematology oncology patients in Canada.

One of Dr. Sinha's latest research initiatives involves working with a group of local clinicians as well as laboratory collaborators on a project looking at feasibility and efficacy of using point of care coagulation testing devices in the pediatric inpatient setting. The goal of this study is to validate point of care machines for the inpatient setting as these machines require much lower blood volumes for the coagulation testing.

Dr. Sinha is also a qualitative researcher. Past qualitative studies have included looking at health related quality of life in pediatric oncology patients as well as examining the efficacy of using written hematology patient education materials to enhance the clinic visit experience. Her qualitative research interests combined with her interests in medical education led her to recently complete a Masters of Health Professions Education through Maastricht University in the Netherlands. In her thesis research project, she examined the challenges faced by physicians at the time of transition to practice and why these challenges exist. Novel findings were observed with respect to the culture of medical training and practice in Canada as well as implications to help ease the process of transition to practice for future physicians. Stemming from this project she is now collaborating on an international study looking at cultural differences during the transition to practice period for physicians in different countries.

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**Katherine Sawicka and Dr. Richard Huntsman**

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**Our Partners**

**Saskatchewan Health Research Foundation**

The Saskatchewan Health Research Foundation (SHRF) has been a generous supporter of child health research. The activities of Saskatchewan's child health researchers continue to be supported by SHRF through its various funding programs. The continuing support of SHRF is acknowledged with appreciation. Further information about SHRF can be found at: shrf.ca
Childhood Asthma

includes children aged 5-14 years living along a rural-urban gradient. While preliminary, the results indicate that there is a rural-urban gradient in asthma prevalence with less asthma in more rural areas but that there is not a similar trend in the prevalence of asthma-like symptoms and that rural dwelling and farming activities was associated with higher lung health morbidity. We also found that despite having a lower asthma prevalence compared to urban centers, the prevalence of asthma is still quite high in these rural centers (approximately 14%) and should be a health priority. The results suggest that the environment plays a role in the presence and severity of asthma but that other factors such as accessing health care may also play a role.

Similar findings of a lower prevalence but higher morbidity have been found previously out of Saskatchewan. Recent work investigating the environment in relation to asthma and related conditions in a rural area included the examination of the effects of endotoxin and tobacco smoke exposure, both independently and jointly on the presence and severity of asthma and wheeze among children. It was a comprehensive assessment that examined multiple outcomes including the presence of asthma or wheeze, lung function, and health-related quality of life, as well as a two-week monitoring component for cases that included diurnal peak flow variation and symptom report. Endotoxin is a ubiquitous exposure found at higher levels on farms, around livestock, and in rural settings. Although pro-inflammatory, endotoxin is thought to play a role in the development of the immune system early in life shifting the immune response from a Th2 to a Th1 response, thus potentially protecting against allergy and asthma. We found that endotoxin can be protective of the presence of disease but aggravate the severity of disease among those with asthma or wheeze. However, these associations were dependent on personal (age and sex) and environmental characteristics (tobacco smoke exposure). This suggests that interactions must be considered when assessing associations with the environment (eg, endotoxin) and that the association between endotoxin and respiratory outcomes is complex and may differ by outcome. Currently, these research directions are being expanded through more thorough clinical and environmental assessments with children living along an urban rural gradient. This includes assessment of atopy through skin prick testing and lung function testing by spirometry.

While the environment is an important consideration in the explanation of the geographic variation of asthma prevalence, globally, diagnostic labeling and contextual factors must also be considered. There are clear geographic differences in asthma prevalence internationally. However, the reasons for these may extend beyond environmental reasons. Through collaboration between the University of Saskatchewan and centers in Poland, Belarus, Ukraine, Republic of Macedonia, and Republic of Georgia, we have observed that labeling patterns may influence asthma prevalence where local labels such as spastic bronchitis may be used in place of asthma. This could have implications on treatment and subsequent well being of children with lung conditions.

There are clearly differences in asthma prevalence geographically. As the reasons for these variations become understood it will aid in our knowledge of the etiology of the disease as well as our ability to manage the disease appropriately. In turn, this should help improve the quality of life for those afflicted with the disease.


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Research Project Opportunities

“Survey of Kawasaki Disease awareness among Saskatchewan physicians”
Study format: Survey
Contact: Dr. Alan Rosenberg, alan.rosenberg@usask.ca

“Relationship of ESR and CRP with inflammatory cytokine biomarkers”
Study format: Database Analysis
Contact: Dr. Alan Rosenberg, alan.rosenberg@usask.ca

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