



MEETING ABSTRACTS

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MEETING ABSTRACT

A1

Testing an emerging animal model for use in the allergenicity assessment of food

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Background: The regulatory assessment of novel food includes tests for allergy. The World Health Organization suggests tests in an animal model of allergy despite the lack of a validated model. We aimed to confirm if C3H/HeJ mice would respond to food of high allergenic potential (peanut), but not to food of low allergenic potential (turkey, potato, spinach).

Methods: In the first study, C3H/HeJ mice were orally treated, once per week for two weeks, with adjuvant and 0 or 2 mg of peanut or turkey. A second study used adjuvant and 0, 0.1, 1 or 2 mg of peanut, potato or spinach. Blood IgE antibodies and spleen interleukin-4 were quantified.

Results: Mice treated with 2 mg peanut developed peanut-specific IgE levels which were significantly higher than control mice ($p < 0.001$, $n = 10$ /group). Mice treated with 2 mg turkey developed a similar IgE response to turkey ($p < 0.001$, $n = 10$ /group). In the second study, allergy was only triggered in one of ten mice treated with 2 mg peanut. Two of ten mice exposed to 1 mg potato had a response. There were no IgE responders to spinach. Spleen cells from both the peanut- and the spinach-treated mice secreted more allergy-promoting interleukin-4 than controls ($p < 0.01$, $n = 7-24$ /group). Levels were not modified in potato-treated mice.

Conclusions: C3H/HeJ mice developed food allergy markers to peanut. However, the incidence varied between experiments. Some mice developed a similar response to foods with low allergenic potential. Thus, this model may not be appropriate for safety assessment of novel food.

A2

Oral allergy syndrome and risk of food-related anaphylaxis: a cross-sectional survey analysis

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Background: Oral Allergy Syndrome (OAS) is an IgE-mediated allergic response to fresh fruits, nuts and vegetables caused by cross-reactivity between pollen allergens and structurally similar food proteins. Alder pollen is a prominent allergen in coastal British Columbia, present at high levels from February- April. We hypothesized that this exposure may lead to increased prevalence of Alder pollen allergy and OAS. We sought to determine our population-based prevalence, cross-reactivity patterns, and incidence of food-related anaphylaxis.

Methods: A chart review of 574 allergic rhinitis patients seen from January 2010 - June 2011 was performed. 274 OAS patients were invited to participate in an online, telephone or in-person survey. Patients completing the survey in the clinic were invited to undergo a panel of skin prick tests.

Results: 63 patients were surveyed, 14 underwent skin testing. Patient characteristics included: median age=37 (range 20-77), 83% female, 36% atopic dermatitis, 24% asthma. OAS prevalence among seasonal allergic rhinitis patients=242/574 (42%). 14/14 patients were skin test positive for Alder and Birch. The most common OAS foods were apple 44/63 (70%), cherry 37/63 (59%), and peach 38/63 (60%). 28 had epinephrine auto-injector devices; 4 had used their device; 6/10 reactions involved foods that had caused OAS including apple, celery, green pepper, tomato, peanut, walnut.

Conclusions: In our population, the prevalence of OAS was slightly lower than expected at 42%. The most common OAS/pollen allergy was Alder, correlating with the high Alder pollen exposure in coastal British Columbia. OAS may be associated with serious reactions requiring use of epinephrine.

A3

What are the beliefs of pediatricians and dietitians regarding complementary food introduction to prevent allergy?

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Background: Food allergy often manifests on first known oral exposure. Hence, the timing of complementary food introduction is of interest. The American Academy of Pediatrics offers specific dietary guidelines that were updated in 2008.

Objective: We wanted to identify the recommendations that general pediatricians and registered dietitians provide to parents and delineate any differences in counselling.

Methods: A 9-item survey was distributed to pediatricians and dietitians online and by mail. Information on practitioner type, gender, length of practice and specific recommendations made regarding complementary food introduction and exposure was collected.

Results: 181 surveys were returned with a 54% response rate from pediatricians. 52.5% of all respondents were pediatricians and 45.9% were dietitians. The majority of pediatricians and dietitians advise mothers that peanut abstinence during pregnancy and lactation is unnecessary. Dietitians were more likely to counsel mothers to breastfeed their infants to prevent development of atopic dermatitis than pediatricians. Hydrolyzed formulas for infants at risk of developing allergy were the top choice of formula amongst both practitioners. Pediatricians were more likely to recommend delayed introduction of peanut and egg, while most dietitians recommended no delay in allergenic food introduction to prevent development of food allergy.

Conclusions: With the exception of whether to recommend breastfeeding to prevent development of atopic dermatitis and whether to delay allergenic food introduction, pediatricians and dietitians agreed closely in their advice and adhered to the 2008 American Academy of Pediatric guidelines. Further education using the latest recommendations should be considered.

A4

Development of a food anaphylaxis education program to help parents live well with food allergies

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Background: Risk for food induced anaphylaxis appears to be increasing with significant impact on children, parents and family life. Families need to understand how to avoid the allergen and recognize and respond to reactions. Safety measures and risk must be balanced to ensure the child and family live well with the allergy. We developed and piloted an education program for parents of children <6 years old recently diagnosed with a severe food allergy.

Method: • Literature review

- Creation of program objectives and outline
- Consultation with health care experts, parent representatives of food allergy organizations and an education specialist
- Development of program content and process
- Feedback from reviewers
- Piloted Program: participant pre-assessment, small group sessions, participant feedback post program

Results: • We developed a small group, 2 session, interactive program using SMARTBoard™ technology, iclickers®, discussion, video clips, skill training and problem-solving

- 43 families registered
- 29 (67%) families completed (27 mothers, 16 fathers, 1 grandmother)
- Parental burden & self-efficacy pre-assessment indicated concerns about activities, communication and allergic reactions
- Auto-injector pre-assessment – 48 demonstrations observed; 73% did not complete all steps correctly
- 32 (73%) people completing the program believed 2 sessions were sufficient

Conclusions: Our pilot suggests this interactive, small group program is a useful resource for families learning how to live with a serious food allergy. We identified activities and topics requiring adjustment and obtained feedback to help improve future sessions. Follow up with families will be important for further evaluation.

A5

Does peanut butter transfer from hands to sports equipment?

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Background: Peanut is a robust allergen. Many parents are concerned about shared sports equipment for children with peanut allergy. Basketball is a common sport for many children, and involves frequent

contact between the ball and hands. We assessed the potential for peanut butter to transfer from peanut contaminated hands to basketballs, and the potential to transfer back to hands.

Methods: Baseline samples were taken from a previously used basketball and the hands of an avid basketball player. Five mL of peanut butter was applied to her hands and wiped with a commercial paper towel. The basketball was dribbled for 5 minutes. Her hands were subsequently washed with regular soap and water. She then played with the potentially contaminated ball for another five minutes. Both rubber and leather basketballs were used. Samples from the ball and hands were taken at each step. The balls were cleaned with commercial bleach cleaner and resampled. Samples were analysed using a monoclonal-based Ara h 1 ELISA. The range of detection was 2-2000 ng/mL.

Results: After application of peanut butter on hands, there was detectable peanut allergen. No detectable peanut was found on the surface of either basketball after 5 minutes of use. No detectable peanut was found on hands after 5 minutes of play with the potentially contaminated basketball.

Conclusions: There is no significant transfer of peanut allergen from contaminated hands to basketballs. A peanut allergic individual is not at significant risk of an allergic reaction from playing basketball.

A6

Experiencing a first food allergic reaction: a survey of parent and caregiver perspectives

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Background: Inadequate knowledge of food allergy and anaphylaxis has been identified by caregivers as an important barrier to coping, and a potential cause of fear and anxiety. This is especially true for those newly diagnosed with food allergy.

Objective: The objectives of this research study were to better understand the experiences of caregivers of children with newly diagnosed food allergy (first allergic reaction within the last 12 months), and to identify the information gaps between what caregivers received at diagnosis and what they perceived they needed.

Methods: An online survey was administered to members of Anaphylaxis Canada (a patient support group consisting of approximately 12,000 members). The sampling strategy included an email invitation, and posting of a URL link on the organization's website.

Results: Of 293 respondents, 208 were eligible (newly diagnosed), and 184 consented. 83.5% of respondents reported being anxious to extremely anxious at first diagnosis, and only 38% stated that they had received enough information. Identified gaps included education on food allergy, anaphylaxis management, how to use epinephrine auto-injectors, and coping strategies. Actions taken by families in response to the diagnosis included avoidance of eating out at restaurants (85%), restriction of their child's activities with other children (61%), limitation of travel (49%), termination of their job (11%), and a reduction in work hours (13%).

Conclusions: Survey findings will be supplemented by a follow-up qualitative study to better understand gaps. These findings will then inform the development of educational strategies for patients newly diagnosed with food allergy.

A7

Descriptive analysis of oral food challenge outcomes at a tertiary care center

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Background: Oral food challenges are the gold standard for clinical tolerance. Predictors of failing a challenge are needed for clinicians.

Methods: A retrospective chart review of 2010 food challenges was performed. Descriptive analysis follows.

Results: We assessed 113 challenges (35 peanut, 28 egg, 12 tree nut, 11 milk, 27 other). There were 29 failures (22 objective, 7 subjective). Among objective challenge failures, 4/7 cashew (57%), 10/35 (29%) peanut, and 6/28 egg (21%) failed. There were no failed milk challenges. Most (79%) failed peanut/cashew challenges occurred at doses $\leq 1.0g$ while 50% of failed egg challenges were final dose (10g). Three children required epinephrine (all cashew), none of whom had a prior known exposure (skin tested 2° peanut/almond). For peanut failures, 40% were history negative. The remainder of the challenge failure reactions were similar to the presenting reaction. Factors for failed challenges compared with successful challenges included atopic dermatitis (100% v 75%), asthma (93% v 63%), and other food allergy (64% v 48%).

Conclusions: The majority of challenge failures were to peanut while the most severe reactions were to cashew, and occurred in patients without prior known exposure. Failures to peanut and cashew occurred at low doses while most egg reactions occurred at high doses. Those who failed a challenge had more atopic disease than those who passed.

A8

Vitamin D levels in peanut allergic children

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Background: The prevalence of peanut allergy is increasing. The reasons for this are not entirely known. A factor may be vitamin D (Vit D).

Methods: This study was performed in a referral allergist's office in Ontario. Prospectively, all patients (<18 years old) with peanut allergy who were tested for peanut specific IgE (PN IgE) also had Vit D measured. All measurements were done between December 2010 and May 2011. The Vit D measure was 25-hydroxy vitamin D. Patients were divided into three groups: deficient (less than 25 nmol/L), insufficient (25-75 nmol/L) and sufficient (75-250 nmol/L). Vit D levels were compared to PN IgE, sex, age, body mass index (BMI) and other allergies.

Results: Fifty peanut allergic patients were included. The mean Vit D level of the patients was 73.8 nmol/L and the 95% confidence interval was 69.6 - 75.7 nmol/L. One patient (2%) had deficient and thirty-one (62%) of the patients had insufficient Vit D levels. Nineteen (38%) had Vit D levels in the sufficient range. There was no correlation between Vit D levels and PN IgE or BMI. Generalized linear modeling showed that vit D levels were predicted by age and sex ($p=0.04$ & $p=0.002$, respectively).

Conclusions: Two percent of our patients had deficient Vit D levels while 62% of our patients had insufficient Vit D levels. These levels were statistically associated with age and sex. Insufficiency of Vit D may play a role in peanut allergy.

A9

Skin prick testing with extensively heated milk or egg products helps predict the outcome of an oral food challenge: a retrospective analysis

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Background: Children with milk and/or egg allergy can often tolerate heated forms of these foods. Skin prick testing (SPT) with commercial extracts followed by a possible oral food challenge (OFC) are routinely performed in these children. This study evaluated the clinical utility of a negative SPT with the real extensively heated milk or egg in predicting whether a child would tolerate an OFC to the heated food.

Methods: Charts were reviewed in a single allergy clinic for any patient with a negative skin SPT to heated milk or egg, prepared in the form of a muffin. Data was collected on the success of the OFC to the muffin as well as age, sex, symptoms and co-morbidities in these patients.

Results: Fifty-eight patients had negative SPT to the heated milk or egg in a muffin. All of these children underwent OFC to the appropriate heated food in the outpatient clinic. Fifty-five of these patients tolerated

the OFC. The negative predictive value for the SPT with the extensively heated food product was 94.8%.

Conclusions: SPT with heated milk or egg products was predictive of a successful OFC to the same food. Larger prospective studies are required to substantiate these findings.

A10

Abstract withdrawn

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A11

Is breastfeeding protective against the development of asthma or wheezing in children? A systematic review and meta-analysis

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Background: Although breastfeeding is strongly recommended for its many benefits, the association between breastfeeding and childhood asthma development remains controversial. Our objective was to systematically review and meta-analyze the association between physician-diagnosed asthma (PDA) or wheezing development and exclusive or any breastfeeding.

Methods: Prospective cohort studies of preschool (4-6 years) and school-aged (7-9 years) children were identified from Medline (1948-June 2011) and Embase (1980-June 2011). Breastfeeding exposure for at least the first 3-4 months of life was defined as exclusive (breast milk as the only source of nutrition) or any (breast milk included in the diet). Outcomes were parent-reported PDA or wheezing. Risk of bias in included studies was assessed using the Newcastle-Ottawa scale. Data were analyzed using the Revman software package and adjusted odds ratios were meta-analyzed using random-effects models.

Results: Ten studies enrolling 35,411 participants were included. Decreased odds of PDA or wheezing development at ages 7-9 years were identified for those who received exclusive breastfeeding [adjusted odds ratio (OR) 0.69, 95% confidence interval (CI): 0.58-0.83] and any breastfeeding (OR 0.53, 95% CI: 0.41-0.68) and at ages 4-6 years for those who received exclusive breastfeeding (OR 0.75, 95% CI: 0.61-0.93). Among the clinically-heterogeneous studies with outcome assessment at ages 4-6 years, any breastfeeding did not change the odds of PDA or wheezing (OR 1.08, 95% CI: 0.76-1.54).

Conclusions: Exclusive or any breastfeeding for at least the first 3-4 months of life was associated with lower odds of PDA or wheezing in children, strengthening support for the current breastfeeding recommendations.

A12

How do questionnaire definitions of atopy status affect sample size calculations for asthma cohort studies in a population of Canadian children?

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Table 1 (abstract A12) Sensitivity, specificity, PPV and NPV of questionnaire-based definitions of atopy compared to the gold standard of SPT and sample size calculations for a nested cohort study

Number of atopic conditions	Sensitivity	Specificity	Youden's index	PPV	NPV	Sample size for nested cohort study
1	54.3%	65.8%	20.1%	72.6%	46.3%	344
2	24.4%	98.7%	23.1%	96.9%	44.8%	2948
3	4.7%	100.0%	4.7%	100.0%	39.3%	21034

Background: Skin prick tests (SPT) are the gold standard for determining atopy. In epidemiological studies of childhood allergy, questionnaire responses are often used to define atopy and predict sample size. Questionnaire-reported hayfever symptoms have shown 28-76% sensitivity and 21-94% specificity compared to SPT. We evaluated how questionnaire definitions of atopy affect sensitivity, specificity and sample size calculations in a population of Canadian children.

Methods: We used questionnaire data from 5619 Toronto schoolchildren participating in the 2006 T-CHEQ study to determine 3 possible questionnaire definitions of atopy, including having any 1, any 2 or all 3 parent-reported physician diagnoses of hayfever, eczema or food allergy. In a nested case-control sample of 208 of these children, atopy was evaluated by SPT to 14 common aeroallergens. Using SPT as the gold standard for atopy, we calculated sensitivity, specificity and sample size for a nested cohort study of particulate exposure and atopy outcome.

Results: Compared with SPT, sensitivity, specificity and Youden's index were 54.3%, 65.8% and 20.1% for 1 reported atopic condition and 24.4%, 98.7% and 23.1% for 2 reported atopic conditions, respectively (Table 1). Requiring at least 2 positive SPT for atopy did not change the sensitivity or specificity. Sample size calculations required 344 and 2948 participants for atopy defined by 1 or 2 atopic conditions, respectively.

Conclusions: Questionnaire definitions of atopy in Canadian children have moderate sensitivity and specificity. More specific definitions decrease sensitivity and increase sample size requirement. Depending on the purpose of the proposed study, either definition of atopy may lead to an adequately-powered study.

A13

Abstract withdrawn

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A14

Abstract withdrawn

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A15

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A16

Abstract withdrawn

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A17

Efficacy of Timothy grass allergy immunotherapy tablet (AIT) treatment in Canadian children and adults with grass pollen-induced allergic rhinoconjunctivitis (ARC)

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Background: The effect of Timothy grass AIT treatment on a Canadian subpopulation was assessed post-hoc using data from 2 randomized, double-blind, trials designed to evaluate grass AIT in North American subjects.

Methods: Subjects 5 years and older with ARC with/without asthma received once-daily 2800 BAU sublingual grass AIT (oral lyophilisate, *Phleum pratense*, 75,000 SQ-T, ~15µg Phl p5) or placebo starting approximately 16 weeks before and continuing throughout the 2009 grass pollen season (GPS). Subjects used daily e-diaries to record ARC symptoms and use of symptomatic medications from randomization through study end (approximately 24 weeks). The primary efficacy endpoint comprised the average total combined daily symptom and medication score (TCS) during the entire GPS. Secondary endpoints included average daily symptom score (DSS) and average daily medication score (DMS). Safety was assessed by monitoring adverse events (AEs).

Results: The Canadian subpopulation included 103 subjects (46 pediatric [5-17y]; 57 adult [18-65y]). AIT-treated subjects showed reductions, vs placebo, of 38% (P=.016) for entire and 45% (P=.005) for peak seasons in TCS; of 38% (P=.013) for entire and 40% (P=.008) for peak seasons in DSS; and of 39% for entire (P=.238) and 60% (P=.005) for peak seasons in DMS. Among the overall population, most treatment-related AEs were mild or moderate. No serious or life-threatening treatment-related AEs occurred; no new safety concerns emerged.

Conclusions: Timothy grass AIT, a novel therapeutic modality, significantly improved ARC caused by Timothy grass pollen and related grasses in Canadian adults and children 5 years and older.

A18

Childhood chronic urticaria and type 1 diabetes

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Background: Chronic spontaneous urticaria is a common condition encountered in childhood, but long lasting persistent urticaria is less frequent. Autoimmune mechanisms may explain up to 30-50% of chronic idiopathic urticaria in adults, but such etiology has been less studied in children.

Method: Case report and literature review.

Results: We present the case of a 10 year old, otherwise healthy boy, who has a 6-7 year history of persistent chronic urticaria requiring ongoing treatment. His symptoms consist of daily urticarial lesions and angioedema with frequent flares. Upper respiratory viral infections, spring/ fall season and stressful events make his condition worse; however, no food or medication triggers has been found so far. The initial work up of chronic

urticaria included CBC, differential, TSH, thyroid antibodies, ANA, C3 and C4 titers, serology for H. Pylori, tryptase level, ESR, stool for O&A, urinalysis, which were entirely negative. A year ago, he developed sudden onset of weight loss, polydipsia and polyuria, and was diagnosed with Type 1 insulin dependent diabetes. He was found to have positive antiGAD antibodies, but thyroid and anti TTG IgA antibodies remained negative. He has been tried on many treatment modalities including various combinations of new and old generation antihistamines, steroids, ketotifen, montelukast, but his condition remains active.

Conclusion: As extension to current guideline for work up of chronic urticaria, besides thyroid and high affinity anti FcεRI receptor autoantibodies, screening for anti GAD and antiTTG IgA antibodies can be considered in cases of persistent long lasting chronic urticaria in childhood.

A19

Update on the prevalence of allergic sensitization to Russian thistle in South-eastern Ontario: retrospective chart review

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Background: Russian thistle (RT) was identified as a potentially clinically significant allergen in phase three of the NHANES survey with over 15% of tested individuals having positive skin tests. Previously estimated prevalence rates of RT skin positivity in Kingston and surrounding catchment area were ~10%. RT was subsequently added to a standard allergen skin testing panel at Queen's University's Allergy clinic.

Objective: To determine the updated prevalence rate of skin test positivity to Russian Thistle in patients from Kingston and the Southeastern Ontario area, in an unselected patient population.

Methods: A retrospective chart review documented the rate of sensitization to RT extract (ALK-Abello). Only patients with appropriate histamine responses were included. Demographic data, presence of relevant clinical symptoms and skin test responses to RT and other cross-reacting allergens were recorded.

Results: 609 charts were reviewed and 304 patients underwent skin testing for RT. Of these, 43 (13.8%) were positive. Of the test-positive cohort, 86% (37/43) had concomitant symptoms of allergic rhinitis/asthma. 41% (18/43) had symptoms that correlated with the predominant RT pollen season. 93% and 58% of these persons had concomitant positive skin tests to ragweed and birch; allergens with known cross-reactivity.

Conclusions: This suggests the prevalence of skin test positivity to Russian thistle in Kingston and surrounding area to be approximately 14%, with over 40% of patients reporting correlating symptoms. A higher degree of cross-reactivity with ragweed than previously known may exist. Continuing to include Russian thistle as part of routine allergen testing may further establish its clinical significance.

A20

"The Roaring Adventures of Puff" (RAP) – a school based asthma education program for children with asthma

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Background: Asthma guidelines recognize asthma education as "an essential component of asthma therapy". The Children's Asthma Education Centre (CAEC)'s small group interactive sessions for children and families does not meet the needs of all families. Schools provide an opportunity for asthma education. The "Roaring Adventures of Puff" (RAP) is an effective, previously validated asthma education program.

Methods: We conducted RAP as 6 weekly, one-hour sessions for 7-11 year old children in schools in Manitoba. Questionnaire data were collected for each child before and 6 months after RAP. The primary outcome parameter was school absenteeism, (year before vs. year after).

Table 1 (abstract A20)

	PRE	POST
Number of children	194	177
Age (years)	8.00 (5-12)	9.00 (6-13) ¹
Days absent from school	8.43 ± 11.90	6.48±6.41*

¹ - mean (range) * - mean±SD, P <0.05

Secondary outcomes included child and caregiver quality of life and caregiver work productivity.

Results: The study was conducted in 25 schools in Winnipeg and 2 rural schools (n=194 students pre- and n=177 students post-intervention). Data for the Winnipeg schools are complete. The reduction in the number of missed school days in the year following RAP was significant (p<0.05). Quality of life for both the child and the parent was significantly improved (p<0.001), as was productivity for the primary caregiver at home (p<0.05). (Table 1).

Conclusions: A school-based asthma education program has significant and clinically relevant benefits for the child, family and school. We strongly encourage adoption of RAP as a school based education program for children with asthma.

A21

Asthma in Canada: perceptions and behaviours

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Background: The EUCAN AIM study was conducted to explore perceptions, behaviors and recent trends in asthma in 6 countries including Canada.

Methods: Households were sampled by random dialing to identify adults and adolescents who had been diagnosed with asthma and had an asthma attack or symptoms in the past year or currently used asthma medications.

Results: In Canada, 7,405 households were screened and 401 (363 adults and 38 adolescents) asthmatics identified. Daytime, night-time and exercise symptoms were reported every day or most days in the past 4 weeks by 29%, 9% and 16% respectively. Over the past year, 49% had shortness of breath while sitting, 30% had episodes limiting their speech and 31% woke frequently. With flares, 45% saw a physician, 28% had an ER or unscheduled visit, while 30% took oral corticosteroids in the past year. One in ten felt their life was in danger from asthma. Despite this, 77% felt asthma was completely or well controlled. Controller medications were taken as needed by 18% and not used at all by 19%. Expectations were low as asthma was considered well controlled by 60% if they had only one ER visit per year, by 62% if they had 3-4 exacerbations per year and by 44% if relievers were needed 3 times per week.

Conclusions: This survey suggests that inadequate control of asthma persists in Canada. Perceptions and behaviors of patients are not in line with current recommendations on asthma control and treatment.

A22

Maternal diabetes amplifies the influence of maternal asthma and smoke exposure on the development of asthma in offspring

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Background: Perinatal programming is an emerging theory for the fetal origins of chronic disease. Maternal asthma and environmental tobacco smoke (ETS) are two of the best-known triggers for the perinatal programming of asthma, while the potential role of maternal diabetes has not been widely studied. The goal of this study was to determine if maternal diabetes contributes to the perinatal programming of asthma, and if so,

whether its effect is additive or synergistic with respect to ETS exposure and maternal asthma.

Methods: We studied 3,574 Canadian children, aged 7-8 yr, enrolled in a population-based birth cohort. Standardized questionnaires were completed by the children's parents, and data were analyzed by multivariate logistic regression.

Results: Asthma was reported in 442 children (12.4%). Asthmatic children were more likely to have mothers, but not fathers, with diabetes. In children without maternal history of diabetes, ETS exposure increased the risk of child asthma by 1.4-fold (adjusted odds ratio, 1.40; 95% confidence interval, 1.13-1.73), while maternal asthma increased risk by 3.6-fold (3.59; 2.71-4.76). In children born to diabetic mothers, these effects were amplified to 5.7-fold (5.68; 1.18-27.37) and 11.3-fold (11.30; 2.26-56.38), respectively. There was no independent effect of maternal diabetes after adjusting for maternal asthma and ETS exposure (OR 0.65, 95%CI 0.16-2.56).

Conclusions: Maternal diabetes contributes to the perinatal programming of child asthma by amplifying the detrimental effects of ETS exposure and maternal asthma.

A23

Immune response of adults with secondary immunodeficiency to pediatric *Haemophilus influenzae* type b (Hib) vaccine

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Background: Patients with chronic renal failure (CRF) develop secondary immunodeficiency as a result of the uremic state and its metabolic consequences, along with a negative impact of the dialysis procedure on the immune system. Such patients are therefore at high risk for septicemia and other severe infections. In non-vaccinated adults, protection against *Haemophilus influenzae* type b (Hib) is mediated by natural anti-capsular polysaccharide antibody. We hypothesized that non-vaccinated adults with CRF lack protective antibody against Hib, but may respond to the pediatric Hib vaccine.

Methods: Serum anti-Hib IgG and IgM were studied in 60 patients with CRF and 40 healthy controls. Thirty-two patients and 19 controls were immunized with one dose of pediatric Hib vaccine; serum antibody levels were assessed pre- and 1, 6, 9 months post-vaccine. Functional antibody activity was studied using a serum bactericidal assay.

Results: Almost 90% of controls, but only 43% of non-vaccinated CRF patients had protective anti-Hib antibody. Four week post-vaccination, all but one patient (97%) have developed protective antibody with a 14-fold increase ($P < 0.05$); in 29 out of 32 (91%) the antibody exhibited bactericidal activity. In the majority of patients, protective antibody persisted 9 months post-vaccine. The vaccine response did not depend on the age, but was lower in CRF patients who had type 2 diabetes, COPD, or heart disease, compared to the rest of the group.

Conclusion: Most adult patients with CRF are at an increased risk of acquiring invasive Hib disease as they lack protective antibody. The pediatric Hib vaccine is highly immunogenic in this group, with higher response compared to other vaccines administered to such patients (hepatitis B and pneumococcal vaccines). This study provides rationale for the immunization of individuals with secondary immunodeficiency against Hib to achieve protective immunity.

A24

Abstract withdrawn

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A25

Abstract withdrawn

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A26

Reproducibility of neutrophil percentages in pooled and non-pooled nasal lavage samples

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Background: Neutrophils form a host's main immediate immune response. COPD, ozone, infection and other factors have been shown to increase neutrophils found in blood, sputum and nasal lavage. Nasal lavage is used to collect cells and inflammatory mediators from the nasal cavity, and can be used to quantify neutrophilic response to inhaled stimuli.

Objective: To compare the reproducibility of neutrophil percentage in a single sample lavage, SSL, versus multiple sample lavage, MSL (3 lavages performed 15 minutes apart and pooled).

Methods: Randomized crossover trial of nasal lavage performed on 4 visits 7-10 days apart, alternating between SSL and MSL done in 7 subjects with perennial allergic rhinitis, 7 with bilateral nasal polyposis and 7 controls.

Results: The mean (\pm SEM) neutrophil percentage was not significantly different between the two methods (80 \pm 12 for SSL, 86 \pm 8 for MSL, $p=0.2$). At a minimum total cell count (TCC) cutoff of ≥ 20 , the neutrophil percentage intraclass correlation (ICC) was similar but not sufficiently reproducible for SSL at 0.588 compared to MSL at 0.641. For samples with $TCC \geq 100$, the neutrophil percentage ICC of SSL was 0.93 (excellent correlation) and that of MSL was 0.676 (satisfactory). The evaluable samples for $TCC \geq 100$ were 60/84 for SSL and 67/84 for MSL. We previously demonstrated in the same experiment that a minimal TCC cutoff of ≥ 100 cells gave excellent eosinophil percentage ICC for both methods (>0.8).

Conclusion: SSL ICC was superior to MSL in measuring nasal lavage neutrophil percentage. This method could be used to assess the effects of inhaled stimuli on the nasal cavity.

A27

Reprogramming in vivo th17 into th17/th2 by Sirp- α dendritic cells in the lungs

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Background: Dendritic cells (DCs) play a crucial role in the development of the adaptive immune response. Unbalance DC response can cause Th1, Th17 or Th2-mediated diseases. By *in vitro* manipulation, Th2 and Th17 cell lines can be reprogrammed into Th1. This highlights the notion of the plasticity of different populations of CD4 T helper cells. So far, the conversion of Th17 memory cells into Th2 cells has not been demonstrated in the tissues.

Methods: Mice were immunized by repetitive administration of inflammatory DCs loaded with OVA protein antigen (OVA-DC), locally (intra-tracheal) or systematically (intravenous). Mice were sacrificed 24h after the last challenge and lymph nodes, serum, lungs and bronchoalveolar lavage were collected to evaluate the immune response.

Results: We showed here, that administration of OVA-DCs generated antigen-specific CD4 T cells that produced IL-17, IL-13 and IL-4 (Th17/Th2) and expressed GATA-3 in the lungs and the lymph nodes. The immunized mice developed an IgE-independent lung inflammation that displayed resistance to treatment with corticosteroids. This inflammation was characterized by a mixed infiltration of neutrophils and eosinophils in the bronchoalveolar lavage. We demonstrated that airway inflammatory SIRP- α DCs converted *in vitro*-generated Th17 but not Th2 cell lines into Th17/Th2. Finally, passive transfer of Th17/Th2 cells was sufficient to drive airway inflammation in naïve mice.

Conclusion: We propose that immunization with inflammatory DCs, regardless of the route of immunization, induces chronic inflammation of the airways, which is associated with a Th2/Th17 response.

A28

Response to influenza immunization in patients with common variable immunodeficiency

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Background: Common variable immunodeficiency (CVID) is a heterogeneous primary immunodeficiency characterized by low serum antibody levels and recurrent infections. Cellular response to immunization in CVID has not been elucidated. In this study aimed to characterize influenza specific memory B-cell responses in patients with CVID and normal controls following influenza immunization.

Methods: CVID and unaffected controls were immunized with the 2010 influenza vaccine. PBMCs were collected on the day of vaccination, and then week 8 and week 16 after vaccination. Memory B cell responses were determined by ELISPOT analysis.

Results: Both the CVID and controls showed similar induction of flu-specific IgM-secreting memory B cells after vaccination. Before vaccination, CVID subjects had significantly lower frequencies of flu-specific IgG and IgA memory B cells. Half of the CVID subjects (4/8) showed an increase in flu-specific IgG-secreting memory B cells post vaccination, whereas the other half showed none. 8/8 controls showed increased flu-specific IgG-secreting memory B cells post-vaccination. None of the CVID subjects developed flu-specific IgA memory B cells post vaccination, compared to 5/8 normal subjects.

Conclusions: A subgroup of CVID may be capable of making IgG memory responses to protein vaccination, although, the ability to maintain these responses needs to be studied with longer follow-up. Individuals with CVID however, demonstrated severe defects in IgA memory responses to vaccination, which may have clinical relevance in terms of protection against influenza. Further work is continuing to evaluate the influenza specific T-cell responses in this patient population.

A29

Assessment of the immune-modulatory activity of sialylated fraction of IVIg in a murine model of allergic asthma

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Background: Intravenous immunoglobulin (IVIg) has potent immune-modulating properties. In OVA-challenged mice, we demonstrated that IVIg markedly attenuates airway hyperresponsiveness (AHR) and abrogates airways inflammation, accompanied by substantial induction of antigen-specific Foxp3⁺ Treg from non-Treg precursors.

Methods: Mice were sensitized (i.n.) with OVA and then received IVIg or sialic acid enriched IVIg (SA-IVIg) fragments (i.p.), and then underwent challenge (i.n.). The induction of CD4⁺CD25⁺Foxp3⁺Treg was determined by flow-cytometry. AHR was measured, using a flexiVent small animal ventilator. Phenotypic properties of dendritic cells (DC) from various experimental groups were assessed by flow-cytometry. Expression of DCIR on DC was evaluated by flowcytometry and ICC. Adoptive transfer of DC was carried out to show the tolerogenic activity of IVIg-primed DC.

Results: IVIg and the SA-IVIg fraction induced Treg and abrogated AHR in OVA-challenged mice comparably. It followed by tolerogenic predisposition of DC (decrease of CD80/CD86 expression and IFN- γ production and increased level of IL-10). Adoptive transfer of DC from IVIg treated mice to OVA-challenged WT syngeneic mice has the similar anti-inflammatory activity of IVIg/SA-IVIg. Expression of DCIR (Inhibitory C-type lectin receptors) on DC of IVIg and SA-IVIg treated mice increased significantly.

Conclusions: IVIg induces Treg likely via conferring tolerogenic activities to DC. This mechanism is dependent on sialylated fraction of IVIg. DCIR is an inhibitory C-type lectin receptor that can be targeted by SA-IVIg and induce an inhibitory signal into the ligated cells. More dissection is required to confirming the role of DCIR in this model.

A30

Role of proteinase-activated receptor-2 in allergic sensitization to house dust mite allergens

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Background: A number of common aeroallergens have serine proteinase activity, which is important for allergic sensitization. House dust mite (HDM), and other allergens with serine proteinase activity activate Protease-Activated Receptor-2 (PAR-2). We have shown that PAR-2 activation in the airways leads to allergic sensitization to concomitantly inhaled antigens, implicating PAR-2 in the pathogenesis of asthma. We hypothesized that PAR-2 activation in the airways by HDM allergens is important for the development of allergic sensitization.

Methods: HDM extract was administered to mice intranasally for 5 consecutive days to induce allergic sensitization. One group of mice received a blocking anti-PAR-2 antibody intranasally before each HDM administration.

Results: Administration of the PAR-2 blocking antibody decreased IL-4, IL13 and IL-33 mRNA as well as IL-4, IL-5 and MIP1A protein levels in the lung tissue, suggesting decreased allergic airway sensitization. Mice sensitized in the presence of the PAR-2 blocking antibody or isotype control were then challenged intranasally with HDM extract for 4 consecutive days. Mucosal exposure to HDM extract induced AHR and airway eosinophilic inflammation. Administration of the anti-PAR-2 blocking antibody during the sensitization phase completely inhibited the development of AHR and airway inflammation in response to HDM challenge.

Conclusions: These results indicate that HDM extract induces PAR-2-dependent allergic sensitization in mice and lead to PAR-2-dependent allergic airway inflammation. These results will allow us to better define the mechanisms of allergic sensitization to allergens with serine proteinase activity.

A31

Inhibition of neutrophil respiratory burst and degranulation responses by CVT-E002, the main active ingredient in COLD-FX

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Background: Human peripheral blood neutrophils contribute to the first line of defence in the immune system and are critical for maintaining health and immunity against opportunistic infections. Neutrophils and their granule-derived mediators are frequently found elevated in patient samples in viral infections, asthma exacerbations, and other respiratory ailments. COLD-FX has been shown to reduce the symptoms and severity of respiratory tract viral infections. Our hypothesis is that COLD-FX modulates neutrophil activity. To determine the effects of COLD-FX on neutrophils, peripheral blood neutrophils (>97% purity) were isolated from healthy human volunteers.

Methods: Neutrophils were preincubated with varying doses of CVT-E002 (0.01-1 mg/ml), the active ingredient of COLD-FX, for 30, 60, and 120 min. Extracellular ROS production was measured by cytochrome c reduction from neutrophils stimulated with 50 ng/ml phorbol myristate acetate for up to 60 min. Degranulation was measured by the presence of extracellular myeloperoxidase, a marker of the azurophilic granules, in neutrophils stimulated with cytochalasin B and f-Met-Leu-Phe for 15 min.

Results: CVT-E002 (1 mg/ml) had no significant effect on viability at up to 120 min of incubation. At 60 min of incubation with CVT-E002, neutrophils showed a 30% reduction in ROS generation ($p < 0.001$) which was maintained for up to 120 min. Preliminary experiments also showed that incubation of neutrophils with CVT-E002 for 30 min inhibited myeloperoxidase release.

Conclusions: These novel findings demonstrate that COLD-FX significantly reduces activation of neutrophils. The implications of this study are that COLD-FX may reduce oxidative stress and tissue-damage triggered by neutrophilic inflammation and activation.

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A32

A new insight into FEIA

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Two cases of patients with food and exercise-induced anaphylaxis (FEIA) with confirmed allergies to oral allergy syndrome are herein presented. Patient A had food anaphylaxis to fresh coriander and tomato and Patient B to fresh celery. These food allergens have structural antigenic similarity to that of birch and/or grass. Both patients' allergies were confirmed by fresh prick-to-prick tests. In both cases, strenuous exercise before the reaction was the only cofactor and the patients had absolutely no symptoms with the offending foods outside of exercise. The exercise had likely lowered the threshold for their reactions. The current literature propose that in FEIA, there is increased GI permeability, leading to enhanced allergen absorption [1]. However, van Nieuvenhoven *et al* found that intestinal permeability actually decreases with exercise [2]. In fact, Bi and Triadafilopoulos noted in their review that strenuous exercise delays gastric emptying of liquids and solids and inhibits gastric acid production [3]. These studies have led us to propose of a novel paradigm for the mechanism of FEIA. The general inhibitory effects of exercise on the GI tract decrease the digestion of oral allergens, thus leaving the allergens more structurally intact and thereby allowing continued systemic absorption of the allergen. This mechanism is supported by Untersmayr and Jensen-Jarolim's findings on the increased risk of labile food allergy induction with the use of antacid medications [4]. We propose the decrease in gastric acid in exercise as a more biologically plausible hypothesis of the mechanism of FEIA to oral allergens foods.

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A33

Efficacy of Omalizumab therapy in a case of severe atopic dermatitis

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Background: Atopic dermatitis (AD) is a common skin disease of childhood which may cause debilitating symptoms and greatly impair the quality of

life of the patient and his relatives [1]. Treatment of chronic AD usually focuses on topical regimen of emollients and immunosuppressants, although systemic immunosuppressive therapy is sometimes required in more severe cases. Omalizumab is a humanized monoclonal anti-IgE antibody that binds at the high-affinity receptor (FcεRI) binding site that has revealed some potential in the treatment of severe and recalcitrant AD [2].

Case: Here, we present the case of a 11-years-old girl who has been under treatment with Omalizumab for the past five years. The patient first presented at 2 months of age with a global and severe AD involving. She was severely atopic with total IgE levels of 121,000, mild asthma, and multiple food allergies. Treatment with oral prednisone, cyclosporin, azathioprine and intravenous immunoglobulins did not improve her skin symptoms significantly. She was hospitalised multiple times for skin infections attributed to the disease and immunosuppressive medication. Treatment with Omalizumab was initiated at 6 years of age. Four months later, SCORAD index improved significantly. Since, her follow-up has been almost free of any remarkable event and treatment with Omalizumab has been well tolerated.

Conclusion: Omalizumab should be considered as a potential treatment in cases of severe AD resistant to classical therapy.

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A34

A large cohort of primary familial cryofibrinogenemia originates from the Magdalen Islands

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Background: Cryofibrinogenemia is a rare disorder that refers to the presence of cold-precipitable proteins in plasma but, unlike cryoglobulinemia, not in serum. It can manifest as vascular occlusion in cold exposed areas. It is most often secondary to various inflammatory disorders, infections or malignancy, but cases of true essential cryofibrinogenemia have been described. To the best of our knowledge only three reports involving families have been published to date, each involving at most three patients.

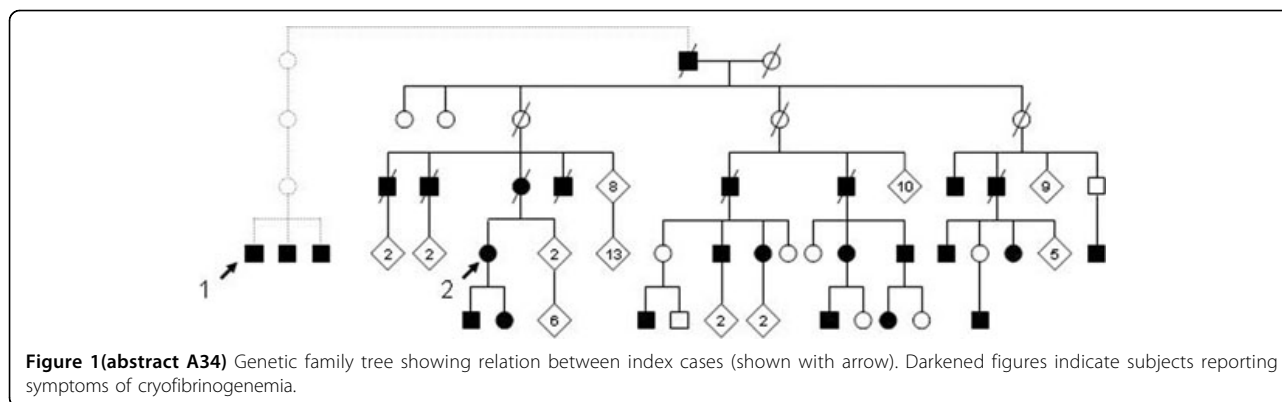
Our cases: Two apparently unrelated patients presented with painful lesions involving cold-exposed areas that would appear every fall and disappear every spring since childhood. Examination revealed ulcers, livedoid and purple-blue discolorations with crusts and scar tissues involving ears, hips, knees, fingers and toes. Immune and inflammatory workup was unremarkable in both patients except for the presence of cryofibrinogen. Treatment with stanozol and dextran was attempted but symptoms returned during winter season.

As both patients reported kindred with similar symptoms, population register was consulted. Patients were found to have common ancestors originating from the Magdalen islands. Furthermore, 24 more individuals from the same family were found to present similar symptoms upon cold exposure, making this the largest cohort of familial cryofibrinogenemia described to date (figure 1). Transmission appeared to follow a dominant pattern with variable penetrance.

Conclusion: We report a large cohort of familial essential cryofibrinogenemia originating from the Magdalen Islands. Genetic association studies will be necessary to identify the causal gene.

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A35

Resolution of antibody in autoimmune urticaria

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Chronic urticaria, defined as widespread daily or nearly daily wheals for at least 6 weeks, with or without angioedema, impacts on patients' quality of life. Natural course is self-limited, with spontaneous remissions and occasional relapses. Antihistamines, leukotriene inhibitor, immunosuppressive agents are used. 60% are idiopathic and 40% are autoimmune due to presence of anti-IgE antibody or IgG autoantibodies against Fc ϵ R1. An association exists between chronic urticaria and autoimmune diseases. We report a case of a patient with autoimmune urticaria, thyroid disease and vitiligo, who showed resolution of histamine releasing antibody (reflab) on remission.

In February 2005, a 44 yr old healthy woman was referred to the Allergy outpatient clinic with two month history of daily hives, moderately controlled with antihistamines, with good response to oral steroid. Lesions were pruritic, raised, erythematous, lasting for < 24 hrs and resolved with purplish discoloration. Screening negative for malignancy, connective tissue disease. TSH normal. Histamine releasing antibody positive, maximum histamine release 27% (<16%). Skin biopsy confirmed chronic urticaria with neutrophils without vasculitis. Sulfasalazine was not tolerated, but control attained with antihistamines and leukotriene inhibitor. By one year, she failed trial of weaning medications.

6 months after presentation she developed vitiligo. 5 years later, she was hypothyroid. By 3 years, the urticaria was in complete remission without medications. Repeat histamine releasing antibody was negative.

There is a known association of severe chronic urticaria with auto antibody etiology and other autoimmune disease. Does resolution of antibody correlate with achieving remission? Further prospective studies are required to establish this relationship.

A36

Anaphylaxis to Kamut® flour in an adult patient: a case report

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Wheat products are nearly ubiquitous in society and are found in many food and non-food products. There are now a variety of Ancient grains that were previously not used in foodstuff in the Western diet. Kamut[®] (khorasan wheat) flour is an ancient grain that was introduced in North America in the late nineties. It is commonly found in multigrain products. Our patient is a 24-year-old female with a past medical history of well-controlled asthma. She describes oral itch and throat itch lasting 30 minutes with eating various types of multigrain products over several years. She eats whole wheat and white bread products without difficulty. After ingesting two pieces of pizza made with Kamut[®] flour she developed chest tightness, back pain, vomiting, difficulty swallowing, and

continued itch in her throat. Her symptoms resolved within an hour of taking an antihistamine. She underwent skin prick testing to the multiple bread products that she had reacted to in the past, as well as Kamut[®] flour. Kamut[®] flour had a 5mm and 7mm wheal with 22mm and 20mm flare respectively on two independent skin tests. Tests to the other multigrain products were also positive. After review of ingredient lists of the multigrain products she underwent further testing to a number of less commonly used flours and had positive tests to triticare, quinoa and amaranth flours. She now carries an epinephrine injector and avoids multigrain and ancient grain products, including Kamut[®]. To our knowledge this is the first case of anaphylaxis to Kamut[®] flour.

A37

Severe ceftazidime-induced drug reaction with eosinophilia and systemic symptoms (DRESS)

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Background: Drug reaction with eosinophilia and systemic symptoms (DRESS) is among the most severe forms of drug hypersensitivity [1]. Antiepileptics are by far the most commonly reported causative drugs [2]. Antibiotics have seldom been reported apart from minocycline [3].

Case: We describe a 55 years old female who developed DRESS with acute liver and kidney failure after being treated with ceftazidime and vancomycin. She was successfully treated with corticosteroids although while tapering prednisone she experienced a recurrence of the skin eruption without any systemic symptoms. She was taken off corticosteroids after 9 months of treatment.

In vitro tests: Fourteen months after the drug reaction, in vitro tests to identify the causal agent were performed. The lymphocyte transformation test (LTT) showed a marked proliferation to ceftazidime (stimulation index (SI): 17 at 100mcg/mL). CD25 was upregulated on CD4+ (induced expression: 17%) and CD8+ (induced expression: 8%) T cells as shown by flow cytometry when cultured with ceftazidime 50 mcg/mL. IFN- γ was markedly elevated in the supernatant of peripheral blood mononuclear cells (PBMC) cultured with ceftazidime 50 mcg/mL when compared to the control media (946 vs 13 pg/mL). Vancomycin did not induce a significant response when compared to the control media in the flow cytometry and the IFN- γ assays.

Conclusions: This is the first report of ceftazidime-induced DRESS to be subsequently proven by allergy tests. This case illustrates the importance of considering every susceptible drug as the potential etiologic agent. We also show the usefulness of in vitro tests in their identification.

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A38

Use of Omalizumab to treat a nine-year old, with steroid-dependent, allergic asthma, adrenal insufficiency and vertebral compression fractures due to steroid induced severe osteoporosis

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Background: In Canada, Omalizumab is indicated for adults and adolescents with moderate to severe persistent allergic asthma, but not for pediatric use (<12 years of age). A 9 year-old boy with steroid dependent, allergic asthma, multiple ICU admissions and severe back pain from compression fractures was referred to our centre. IgE was 1337 IU/ml. Skin prick testing showed multiple positive reactions. Asthma treatment included inhaled corticosteroids and frequent courses of oral prednisone.

Methods: After obtaining necessary approvals and informed consents, Omalizumab treatment, 375mg every 2 weeks, was initiated in September 2010. Serum cortisol levels, bone density, spirometry, and PAQLQ were used to monitor clinical response.

Results: After 11 months, the changes below were noted.

Conclusions: The patient improved and was off oral/inhaled corticosteroids with no asthma exacerbations. Spirometry, serum cortisol, PAQLQ and bone density improved. Prednisone treatment in young asthmatic children can be associated with serious side effects. Omalizumab therapy can permit steroid withdrawal and resolution of side effects.

A39

Seminal fluid anaphylaxis

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Background: Seminal Fluid Anaphylaxis (SFA) is a rare condition caused by IgE mediated sensitization to seminal proteins during or after coitus. It has been reported about 80 times in the medical literature ranges in symptomatology from local pruritus to serious systemic reactions. This is the first known documented case in Canada.

Methods: One case is presented including clinical course and positive skin prick testing to husband's seminal fluid after consultation with an allergist and obtaining written consent.

Table 1(abstract A38)

	Daily Prednisone	Daily ICS dose	FEV1	Serum cortisol [‡]	Bone density*	PAQLQ [†]
2010 ^a	30 mg	800 mcg	1.46 L	12 nmol/L	0.626 g/cm ²	4.7
2011 ^b	NIL	200 mcg	1.98 L	215 nmol/L	0.686 g/cm ²	7

^a Pre Omalizumab treatment

^b Post Omalizumab treatment

[‡]Morning results, range 185 – 624 nmol/L

*Total hip

[†]Pediatric asthma quality of life questionnaire with standardized activities: low 1 – 7 high

Results: A 54 year-old woman with no atopic history was referred for evaluation after four progressive episodes of post-coital reactions with her husband. The first two episodes consisted of itching of both palms and soles of feet with minimal vaginal pruritus. After abstaining, a third episode a month later consisted of hives on the patient's legs and back with significant vaginal pruritus. The fourth episode the patient developed vaginal and generalized pruritus, urticaria, palpitations and trouble breathing through her nose, immediately post-coital. All symptoms resolved spontaneously with no treatment. Skin prick testing was conducted using the partner's seminal fluid to confirm the clinical suspicion of SFA, producing a wheal of 8mm and flare of 5cm.

Conclusions: The partner's seminal fluid will be fractionated to determine the specific amino acid sequence of interest by serum-specific IgG/IgE by ELISA to the seminal plasma and plasma proteins. An SDS-PAGE and IgE immunoblot assay will confirm specific activity to the semen. Of clinical relevance, mass production of this protein will be used for local or systemic immunotherapy to prevent future SFA.

A40

Self-administration of intravenous C1 esterase inhibitor (Berinertá) in patients with Hereditary Angioedema decreases number of days spent in an emergency room

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Background: Hereditary Angioedema (HAE) is a rare, inherited, autosomal dominant disease caused by a deficiency in C1-esterase inhibitor. It affects one in every 50,000 to 100,000 individuals. There were no approved treatments for HAE in North America until 2009, when C1-esterase inhibitor (Berinertá) was released. It is an intravenous medication that requires patients to present to an emergency room (ER) for treatment. We present two cases of patients with HAE who self-administered the medications, decreasing their number of emergency room visits substantially.

Methods: Cases were obtained from office visits with an allergist and continued communication with the patients.

Results: The first patient averaged around 17 visits to an ER per year. She and her husband are both paramedics and they were able to start intravenous lines for the required infusion at home. After she began self-administering the medication, she had no further visits to an emergency room. The second patient suffered from very frequent attacks and had poor venous access. In 2009, she had 37 ER visits and in 2010 alone, 48 visits. A Hickman catheter was placed in her internal jugular vein for easy access. After she began self-administration 5 months ago, she has had only 3 presentations to the ER.

Conclusions: Self-administration of C1-esterase inhibitor (Berinertá) dramatically improved the lives of these two young patients, and resulted in a considerable decrease in the number of days spent in an emergency room.

A41

Efficacy and safety of fluticasone furoate nasal spray in adult and adolescent subjects with uncomplicated acute rhinosinusitis

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Background: Uncomplicated acute rhinosinusitis (ARS) is usually a self-limiting inflammatory condition often treated with antibiotics. This study evaluated an alternative treatment for symptomatic relief of uncomplicated ARS, fluticasone furoate nasal spray (FFNS).

Methods: This randomized, double-blind, placebo-controlled, parallel-group, multicenter, 2-week treatment study evaluated FFNS 110 mcg once daily, twice daily vs. placebo in adults/adolescents with uncomplicated ARS. Eligibility criteria reflected a clinical diagnosis and eliminated confounding conditions like common cold, symptomatic allergic rhinitis (AR), and other sinonasal conditions. Subjects with daily major symptom score (MSS; a composite score of 3 symptoms [nasal congestion/stuffiness, sinus headache/pressure or facial pain/pressure, and postnasal drip on a 0-3 scale]) >4.5 at baseline were randomized.

Results: The study demonstrated a statistically significant reduction in daily MSS by both FFNS doses compared to placebo (LS mean differences vs. placebo of -0.357 [p=0.014] and -0.386 [p=0.008] for BID and QD, respectively). The differences in median time to symptom improvement between placebo (8 days) and each FFNS dose (7 days) were not

statistically significant. There were no treatment differences in antibiotic use due to the development of possible fulminant bacterial rhinosinusitis (3% in each group). The safety profile of FFNS was similar to placebo.

Conclusion: FFNS reduced symptoms of uncomplicated ARS compared to placebo and was well tolerated, providing support for withholding antibiotics in selected patients. (FFR113203/ GSK funded)

Cite abstracts in this supplement using the relevant abstract number, e.g.: Keith *et al.*: Efficacy and safety of fluticasone furoate nasal spray in adult and adolescent subjects with uncomplicated acute rhinosinusitis. *Allergy, Asthma & Clinical Immunology* 2011, 7(Suppl 2):A41