MEETING ABSTRACTS

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ORAL PRESENTATION SESSION 1: ASTHMA: PATHOPHYSIOLOGY AND CLINICAL MANAGEMENT

01
O01 - Validation of asthma and eczema in population-based Swedish health registers
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Clinical and Translational Allergy 2014, 4(Suppl 1):O01

Background: Valid measures of asthma and eczema in epidemiological studies may be a challenge. Population-based registers can be useful as they do not rely on recall and allow for follow-up. Our aim was to ascertain if asthma/eczema medication is a suitable proxy for asthma/eczema and to validate register-based asthma diagnoses.

Method: Data were retrieved on all 0-17-year-old individuals with reported asthma/eczema medication in the Swedish Prescribed Drug Register (SPDR) and/or an asthma diagnosis in the National Patient Register (NPR) between 2005-2009 (N=121,944). Medical records retrieved from prescribing units, for 2,250 randomly selected individuals, were reviewed to estimate the proportion of individuals with 1) asthma/eczema medication in the SPDR who had a doctor diagnosis of asthma/eczema and/or; 2) fulfilled predefined criteria of asthma by the Swedish Paediatric Society (positive predictive value, PPV); 3) an asthma diagnosis in the NPR verified as asthmatics by predefined criteria.

Results: PPV for asthma medication as a proxy for a doctor diagnosis of asthma was 0.68 (95% CI: 0.64-0.72) in pre-school children (0-4.5 years) and 0.89 (95% CI: 0.85-0.92) in school-age children (>4.5-17 years). The corresponding PPV for predefined criteria of asthma was 0.75 (95% CI: 0.70-0.78) and 0.94 (95% CI: 0.91-0.96) in pre-school children and school-age children respectively. Almost all (99%) of school-age children and 78% of pre-school children with an asthma diagnosis in the NPR were verified as asthmatics.

PPV for eczema medication as a proxy for an eczema diagnosis was estimated to 0.26 (95% CI 0.18-0.38) in children 0-17 years.

Conclusion: Asthma medication is the SPDR is a suitable proxy for asthma in older children; the same approach is insufficient for eczema. Furthermore, the quality of asthma diagnoses in the NPR is high. This validation study of two Swedish registers opens for future large nationwide studies on asthma.

02
O02 - Exercise-induced bronchoconstriction in young athletes
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Clinical and Translational Allergy 2014, 4(Suppl 1):O02

Introduction: Exercise induced bronchoconstriction (EIB) is more prevalent in elite athletes compared to controls. It is however unclear how many young athletes suffer from EIB.

Methods: Football players (n=24), basketball players (n=15), swimmers (n=12) were recruited at the elite sport high school (12-14 years old) in Leuven (Belgium). Age-matched controls (n=7) were recruited among children performing sports at a recreational level. Eucapnic voluntary hyperventilation test was used to assess EIB according to previous standards. Subjects breathed a gas mixture (5% CO2, 21% O2 and 74% N2) at a target rate of 85% of their maximal voluntary ventilation (MVV) per minute (assessed before the EVH test) for 6 minutes. Spirometry was performed at 1, 5, 10 and 15 min after the EVH challenge. EVH test was considered positive if the fall in FEV1 ≥10%. Allergy for house dust mite, grass pollen, tree pollen, weeds, dog and moulds was assessed by skin prick test (considered positive if at least one SPT was positive).

Results: FVC (%) was significantly higher in swimmers compared to controls (p<0.05). EIB (fall in FEV1 ≥10% at EVH test) was diagnosed in 4 out of 12 swimmers, 3 out of 20 football players, 1 out of 11 basketball players and 1 out of 7 control individuals. Only 1 of these individuals (swimmer) had pre-existing asthma. Maximal fall in FEV1 (%) was significantly higher in swimmers (mean: -8.8%) compared to football players (mean: -6.1%), basketball players (mean: -1.0%) and controls (mean: -3.6%) (p=0.027). Allergy was equally distributed among four groups: 7 out of 24 football players, 1 out of 7 controls, 5 out of 11 basketball players, 3 out of 11 swimmers (p=0.94).

Conclusion: Swimmers had highest prevalence of EIB. Maximal fall in FEV1 was significantly higher in swimmers compared to other athletes and controls despite higher FVC levels. Competitive swimmers are exposed to both intense exercise and airborne trichloramine in contrast to other athletes (only intense exercise) and controls. This might explain why airway hyperreactivity is more common in swimmers compared to other athletes.

03
O03 - Expression of pulmonary surfactant protein D (SP-D) and interleukin 13 in the serum of atopic and non-atopic severe pediatric asthmatics: effects of glucocorticoid and sodium cromoglycate treatment
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Clinical and Translational Allergy 2014, 4(Suppl 1):O03

Rationale: Serum biomarker analysis is a valuable noninvasive tool for assessment of asthma severity in children. Surfactant protein D (SP-D) is an immunoprotective lung collectin produced in the lung in large quantities. We have previously shown that allergen-induced airway inflammation was associated with significant changes of SP-D release and
that glucocorticoid therapy increases SP-D in the lung. Whether such changes could be detected in the peripheral circulation of asthmatic patients is not known. We hypothesized that serum SP-D would reflect disease severity in asthmatic children.

Methods: SP-D and IL-13 serum levels were measured in 122 patient samples and 22 samples from non-asthmatic controls. Serum was collected from peripheral blood of 25 children with asthma (diagnosed according to the American Thoracic Society criteria), that was inadequately controlled according to European Consensus Guidelines, as described previously by Gemou-Engesaeth et al., 2002. Children were characterized as atopic (17) and as nonatopic (8). Their age was between 7 and 16 years. In addition 15 nonasthmatic controls matched for age and atopic status were included in the study. SP-D was assessed in duplicate samples in two dilution (1:5 and 1:10) using a commercially available human SP-D ELISA kit (BioVendor).

Results: The inter-assay and inter-experimental variability of the measures was <10%. IL-13 levels varied between 0.171 pg/ml. SP-D levels varied between 19.373 ng/ml. The expression of IL-13 was significantly greater in the asthmatic serum samples than in the controls (25.6±2.1 vs. 14.3±2.0 p=0.0011, 2-tailed, paired student t-test). In contrast, SP-D levels were significantly greater in the control samples than in the asthmatic samples (148.2±5.9 vs. 200.2±20.2; p=0.0478). Treatment with glucocorticoids or sodium cromoglicate did not affect IL-13 or SP-D in the serum although in the sodium cromoglicate treated patients there was a trend for reduced IL-13.

Conclusions: These data indicate that serum levels of IL-13 and SP-D correlate with the presence of allergic airways disease in children. We speculate that these biomarkers may provide useful noninvasive indicators that reflect disease state in moderate to severe childhood asthma.

Funding: GSK, Rhône-Poulenc Rorer, The Norwegian Asthma and Allergy Association, NAHR, R01AI072197(AH); RC1ES018505(AH); P30ES013508(AH).

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**O04 - Effects of 5-lipoxygenase pathway inhibition on rhinovirus-associated bronchial epithelial inflammation**

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Clinical and Translational Allergy 2014, 4(Suppl 1):O4

Background: Human bronchial epithelial cells produce a variety of inflammatory mediators upon exposure to rhinovirus (RV), a major precipitant of asthma exacerbations. We hypothesized that anti-leukotriene (LT) treatment of epithelial cells with or without exposure to supernatants of RV-infected peripheral blood mononuclear cells (PBMCs) may inhibit RV-induced up-regulation of inflammatory cytokines.

Methods: PBMCs were isolated from a non-atopic, non-asthmatic donor and as nonatopic (8). Their age was between 7 and 16 years. In addition 15 nonasthmatic controls matched for age and atopic status were included in the study. SP-D was assessed in duplicate samples in two dilution (1:5 and 1:10) using a commercially available human SP-D ELISA kit (BioVendor).

Results: The inter-assay and inter-experimental variability of the measures was <10%. IL-13 levels varied between 0.171 pg/ml. SP-D levels varied between 19.373 ng/ml. The expression of IL-13 was significantly greater in the asthmatic serum samples than in the controls (25.6±2.1 vs. 14.3±2.0 p=0.0011, 2-tailed, paired student t-test). In contrast, SP-D levels were significantly greater in the control samples than in the asthmatic samples (148.2±5.9 vs. 200.2±20.2; p=0.0478). Treatment with glucocorticoids or sodium cromoglicate did not affect IL-13 or SP-D in the serum although in the sodium cromoglicate treated patients there was a trend for reduced IL-13.

Conclusions: These data indicate that serum levels of IL-13 and SP-D correlate with the presence of allergic airways disease in children. We speculate that these biomarkers may provide useful noninvasive indicators that reflect disease state in moderate to severe childhood asthma.

Funding: GSK, Rhône-Poulenc Rorer, The Norwegian Asthma and Allergy Association, NAHR, R01AI072197(AH); RC1ES018505(AH); P30ES013508(AH).

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**O05 - Once-daily tiotropium in adolescents with symptomatic asthma despite inhaled corticosteroid treatment: a dose-ranging study**

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Background: Once-daily tiotropium is an effective and safe add-on bronchodilator for asthmatic adults who remain symptomatic despite inhaled corticosteroid (ICS) treatment in accordance with current international guidelines. Despite the wide range of available therapy options, many adolescents with asthma have disease that is sub-optimally controlled.

Methods: This randomised, placebo-controlled, double-blind, incomplete crossover study (NCT01122680) evaluated the efficacy and safety of 5, 2.5 and 1.25 µg once-daily (evening) tiotropium (via Respimat® Soft Mist™ Inhaler) versus placebo in three 4-week treatment periods in adolescents (aged 12-17 years) with symptomatic asthma despite medium-dose ICS. The primary efficacy end point was change in peak forced expiratory volume in 1 second within 3 hours post-dose (peak FEV1 1(0-3h)) assessed as a response (difference from baseline). Secondary end points included trough FEV1, FEV1 area under the curve (AUC 0-12h), peak expiratory flow (PEF am/pm) responses and Asthma Control Questionnaire (ACQ) score.

Results: Of 139 enroled patients, 105 were randomised to receive one of four treatment sequences. Peak FEV1 1(0-3h) response was statistically significantly greater with 5 µg tiotropium than placebo (difference from placebo: 113±39 (SEm) vs: p=0.0043). Trough FEV1 and AUC 1(0-3h) responses with 5 µg tiotropium were also significantly higher versus placebo (p<0.0001 and p=0.0001, respectively). A superior PEF am and PEF pm response was observed with 5 µg tiotropium over placebo. Although ACQ scores improved from baseline (2.091) with tiotropium (5 µg, 1.287; 2.5 µg, 1.366; 1.25 µg, 1.189), they also improved with placebo (1.371), which may be due to the short duration of this study. Safety profile was balanced across treatment groups, with the majority of adverse events being mild to moderate in severity and no dose-dependency observed.

Conclusion: This first study of tiotropium as add-on to ICS in adolescents with symptomatic asthma demonstrates that 5 µg tiotropium is an effective and well-tolerated dose.

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**O06 - The Chelsea, asthma and fresh fruit intake in children (CHAFFINCH) trial – pilot study**

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Clinical and Translational Allergy 2014, 4(Suppl 1):O6

Background: Observational evidence suggests that intake of fruits, and of dietary antioxidants would be protective against symptoms and severity of asthma in children. Intervention studies with single or combined antioxidant
supplements have so far been disappointing. To date, there have been no interventions using fresh fruit on asthmatic children. We plan to carry out a 3 month randomised controlled trial (RCT) in 360 children, to establish whether increasing fruit intake could be useful in the management of childhood asthama.

**Objective of the Pilot:** To assess recruitment strategy, follow-up, tolerance to respiratory and biomarker tests, and fruit intake compliance (FIC).

**Methods:** 32 children aged 6 to 10 years old with mild to severe asthma were recruited and randomly allocated to one of the following fruit groups daily, for a month, in addition to their usual diet: 1) an apple, 2) a banana, 3) an apple and a banana, 4) control. Quality of life, lung function, and inflammation were measured with the Juniper Asthma Quality of Life Questionnaire (JAQoLQ), pre- and post- bronchodilator spirometry, and exhaled nitric oxide (eNO), respectively, at baseline and at follow-up. FIC was measured through a dietary questionnaire (DQ) and sticker charts. Urinary metabolomic analyses (UMA) were carried out to identify specific metabolites of fruit intake.

**Results:** 28 children (88%) completed all the tests at baseline and at follow-up. All children were able to perform satisfactory respiratory and eNO tests. Levels of eNO were 18% lower in groups 2 and 3 after the intervention. DQ and sticker charts were the best FIC methods, with a 96% adherence. UMA showed higher levels of polyphenol antioxidants after ingestion of fruits.

**Conclusion:** A RCT with fresh fruit is a feasible intervention in small children with various levels of asthma.

**Acknowledgement:** UK Clinical Research Governance Trial ID 11874. Funded by the BUPA Foundation.

ORAL PRESENTATION SESSION 2: ATOPIC DERMATITIS, UTRICARIA AND FOOD ALLERGY

07

**O07 - Phenotypes of atopic dermatitis depending on the timing of onset and the evolution in childhood**

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Clinical and Translational Allergy 2014, 4(Suppl 1):O07

**Background:** Atopic dermatitis is an inflammatory, pruritic skin disease that often occurs in early infancy with a chronic course. However, the description of different subtypes of atopic dermatitis, depending on the timing of onset and the evolution of the disease in early childhood, is lacking.

**Objective:** To identify different phenotypes of atopic dermatitis, using the symptoms in the first 6 years of life from a prospective study, and whether they differ in their association with parental allergic status and prenatal farm-related exposures.

**Method:** 1045 children who participated in the birth cohort study, Protection Against Allergy-Study in Rural Environments (PASTURE), were included in the current study. Symptoms of atopic dermatitis were reported by parents from birth to 6 years of age by yearly questionnaires and defined as an intermittent or persistent itchy rash on typical locations. We used longitudinal latent class analysis (LCA) to identify different phenotypes of atopic dermatitis symptoms in childhood based on the first 6 years of life.

**Results:** The LCA model with the best fit to PASTURE data was a model with 4 classes. Therefore, we could determine 4 phenotypes of atopic dermatitis symptoms, defined as follow: never or infrequent (894, 85.6 %), early-transient (52, 5.0 %), early-persistent (55, 5.3%), and late (44, 4.2%). The parental history of allergies was strongly associated with the early-persistent phenotype. Maternal contact to pets (cat or dog) during pregnancy showed a significantly protective effect only on the early-persistent phenotype.

A same tendency was observed with prenatal contact to farm animals, even though not significant. However, maternal consumption of farm milk during pregnancy showed a protective effect, only on the early-transient phenotype of atopic dermatitis symptoms.

**Conclusion:** Using latent class analysis, 4 different phenotypes of atopic dermatitis symptoms were identified. The association between prenatal exposures and atopic dermatitis symptoms were different depending on the phenotypes of atopic dermatitis.

08

**O08 - Increased early life Transepidermal Water Loss (TEWL) values can predate atopic dermatitis in asymptomatic infants: results from the BASELINE study**

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Clinical and Translational Allergy 2014, 4(Suppl 1):O08

**Background:** We sought to ascertain whether a non-invasive measurement of skin barrier function at birth could predict the development of Atopic Dermatitis in asymptomatic infants enrolled in an unselected prospective birth cohort.

**Method:** 1903 infants were enrolled on the Cork BASELINE Birth Cohort study from July 2009 to Oct 2011. Infants had Transepidermal water loss (TEWL) measured at birth, 2 and 6 months. AD was assessed at 6 and 12 months, using the UK Diagnostic Criteria. Severity was assessed by SCORAD method at 6 months and by both SCORAD and Nottingham Severity Score (NSS) at 12 months.

**Results:** The point prevalence of AD in our cohort was 18.7% (299/1597) at 6 months and 15.52% (232/1494) at 12 months. TEWL was lowest at birth, with mean reading 7.32 gwater/m2/hr (±3.33 gwater/m2/hr). It rose between birth and 2 months, mean 10.97 gwater/m2/hr (±7.98 gwater/m2/hr) where it plateaued at 6 months with mean reading 10.71 gwater/m2/hr (±7.10 gwater/m2/hr). A raised TEWL at 2 months was independently predictive of Atopic Dermatitis at 12months, but not 6 months when controlling for mode of recruitment, parental atopy and presence of AD.

**Conclusion:** Increased Transepidermal water loss is a non invasive signal for skin barrier impairment seen at 2 months in asymptomatic infants prior to clinical appearance of Atopic Dermatitis. This signal is not seen at birth. This finding has implications for the possible prevention of AD if sufficient intervention was put in place to maintain the skin barrier, prior to the appearance of AD.

09

**O09 - Early supplementation with Lactobacillus rhamnosus HN001 reduces eczema prevalence to 6 years: does it also reduce atopic sensitisation?**

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Clinical and Translational Allergy 2014, 4(Suppl 1):O09

**Background:** The role of probiotics in prevention of allergic disease is still unclear; efficacy may depend on the timing, dose, duration and specific probiotic used. Using a double blind randomized placebo-controlled trial (Australian New Zealand Clinical Trials Registry: ACTRN12607000518460), we have shown that in a high risk birth cohort, maternal supplementation from 35 weeks gestation until 6 months if breastfeeding and infant supplementation from birth until 2 years with Lactobacillus rhamnosus HN001 (HN001) (6 x 1010 cfu/day) halved the cumulative prevalence of eczema at 2 and 4 years. Bifidobacterium animalis subsp lactis HNO19 (HN019) (9 x 107 cfu/day) had no significant effect.
Objective: To determine whether differences in effects of HN001 and HN019 on eczema persist to age 6 years, and to investigate effects on sensitization.

Methods: Standard procedures were used to assess eczema (The UK Working Party’s criteria), eczema severity (SCORAD), atopic sensitization (skin prick tests (SPT), total and specific IgE) and standard questions used for asthma, wheeze and rhinoconjunctivitis.

Results: HN001 was associated with significantly lower cumulative prevalence of eczema (HR=0.56, 95% CI 0.39-0.80), SCORAD≥10 (HR=0.69, 0.49-0.98) and SPT sensitization (HR=0.69, 95% CI 0.48-0.99). The point prevalence of eczema (RR=0.66, 95% CI 0.44-1.00), SCORAD≥10 (RR=0.62, 95% CI 0.38-1.01) and SPT sensitization (RR=0.72, 95% CI 0.53-1.00) were also reduced among children taking HN001. HN019 had no significant effect on any outcome.

Conclusion and clinical relevance: This study provides evidence for the efficacy of the probiotic *Lactobacillus rhamnosus* HN001 in preventing the development of eczema and possibly also atopic sensitization in high risk infants to age 6 years. The absence of a similar effect for HN019 indicates that benefits may be species-specific.

O10 - Rupatadine is effective and safe in the treatment of Chronic Spontaneous Urticaria (CSU) in pediatric patients (2-11 years old)

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Clinical and Translational Allergy 2014, 4(Suppl 1):O10

Background: Rupatadine is an anti-H1/PAF antagonist that has proven to be effective and safe in adults/adolescents for Allergic Rhinitis (AR) and Urticaria. In addition, Rupatadine has been recently licensed for the symptomatic treatment of AR in children aged 6-11 years. The aim of this study was to assess the efficacy and safety of Rupatadine oral solution in children with Chronic Spontaneous Urticaria (CSU).

Methods: A randomized, double blind, multicenter, parallel group, placebo and active controlled clinical trial was conducted in children aged 2-11 year suffering from CSU. Patients were randomly allocated to one of the treatment groups: Rupatadine 1mg/mL, Desloratadine 0.5mg/mL, or placebo oral solutions. Dosing was done according to patients’ weight (2.5 mL > 10 Kg - 25 Kg or 5 mL > 25 Kg). Patients received the study medication during 6 weeks (42 days) and symptoms were scored daily in the patient diary. There was a safety follow up period of 6 weeks (42 days) after the end of treatment. The primary efficacy variable was the change in the 7-day cumulative children adapted Urticaria Activity Score (UA7S) over the treatment period. Other efficacy assessments included the mean number of wheals (MNW) score, mean pruritus (MPS) score and Children Dermatology Life Quality Index (CDLQI). Adverse events were recorded through the study (84 days).

Results: A total of 199 patients were included in the ITT analysis: 63 in the Rupatadine group, 69 in the Desloratadine group, and 67 in the placebo group. The UAS7 was found to be significantly reduced in the Rupatadine group (-55.8%; p=0.001) and the Desloratadine group (-48.4%; p=0.013) as compared to placebo (-30.3%). Also, CDLQI scores were significantly improved in both active treatment groups as compared to placebo. The overall incidence of adverse events was similar among treatment groups.

Conclusion: Rupatadine, in accordance with the current CSU guideline recommendations, is an effective and safe choice in CSU in 2-11 yr children.

O11 - Cor a 14: the missing link in the molecular diagnosis of hazelnut allergy?

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Clinical and Translational Allergy 2014, 4(Suppl 1):O11

Background: Hazelnut (Corylus avellana) allergy shows age and geographic related sensitization profiles that have not been fully resolved.

Objectives: To study sensitization to hazelnut components in different age groups of hazelnut allergic patients and infants with atopic dermatitis (AD) sensitized to hazelnut in a birch-endemic region.

Methods: Seventy-five hazelnut allergic patients, 14 infants below 1 year of age with AD sensitized to hazelnut and 15 age related healthy control individuals were tested for IgE reactivity to rCor a 1.04, rCor a 8, rCor a 9, rCor a 11, rCor a 14 by ImmunoCAP and rBet v 1 by ISAC 103 microarray.

Results: Thirty-seven patients suffered from a systemic reaction and 38 patients reported an oral allergy syndrome (OAS) after eating hazelnut. In the population with systemic reactions, sensitization to Cor a 14 was seen in 19/20 preschoolchildren (median age (range) 2.6 years (1.0 – 5.4)), 8/10 schoolchildren (10.2 years (8.0 – 13.8)) and 2/7 adults (28 years (18 – 33)) whereas sensitization to Cor a 9 was observed in 16/20 preschoolchildren, 7/10 schoolchildren and 3/7 adults. A minority of 13/37 and 5/37 was sensitized to Cor a 11 and Cor a 8. Combining of Cor a 14 and Cor a 9 enables us to correctly diagnose respectively 100 %, 80 % and 43 % of systemic reactions in preschool-, schoolchildren and adults. In contrast sensitization to Cor a 1.04 was generally associated with OAS, IgE reactivity to Cor a 1.04 was observed in respectively 6/7, 8/9 and 22/22 of preschool-, schoolchildren and adults. Sensitization to Cor a 14 was seen in two patients with OAS, although these sIgE levels to Cor a 14 were significantly lower. Twenty-one percent of the infants with AD showed Cor a 14 sensitization, whereas 4/14 and 1/14 showed IgE reactivity to Cor a 9 and Cor a 11.

Conclusion: Quantification of Cor a 14 can be of great value in hazelnut allergy diagnosis. Sensitization to Cor a 14 predominantly occurs in pre- and schoolchildren with severe hazelnut allergy and can have early onset (< 1 year of age).

O12 - Specific IgE levels for goat’s and sheep’s milk after successful oral immunotherapy to cow’s milk in children

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Clinical and Translational Allergy 2014, 4(Suppl 1):O12

Introduction: Cow’s milk (CM) oral immunotherapy has proven to be effective as a treatment for persistent CM allergy. Allergic reactions to goat and sheep cheeses have been described in almost 25% of patients desensitised to CM, indicates that immunotherapy is specific for each milk.

Objectives: To describe changes of goat’s IgE and sheep’s IgE in patients who tolerated CM after a CM oral immunotherapy.

Methods: 24 children aged between 4 and 13 who achieved tolerance to milk after CM immunotherapy were included. Specific IgE to cow’s casein, sIgE to whole goat’s milk and sIgE to whole sheep’s milk at baseline and at 24 months follow up were analysed (CAP-Phadia). The patients were classified in two groups: high risk (17 patients) and low risk (7 patients) based on the premedication, number of adverse reactions and time to achieve a complete tolerance to CM.

Results: The median of Specific IgE to CM casein, goat’s whole milk, sheep’s whole milk baseline were 24.3KU/L, 31.2KU/L and 27.4KU/L and 9.5KU/L, 16.9KU/L and 17.3KU/L after 24 months of follow up (p<0.05). In the high risk patients the median of Specific IgE to CM casein, goat’s whole milk, sheep’s whole milk were 33.7KU/L, 43.7KU/L and 37.1KU/L at baseline and 13.1KU/L, 23.9KU/L and 23.6KU/L after 24 of follow up (p<0.05). In contrast, in the low risk group the Specific IgE to CM casein, goat’s whole milk, sheep’s whole milk did not show a significant decrease after 24 of follow up. 4 patients showed a different patron referred to IgE-goat’s milk and IgE-sheep’s milk compared with CM, independently of risk group.

Conclusions: We found a decrease of IgE levels to whole goat’s and sheep’s milk after oral immunotherapy to CM.
ORAL PRESENTATION SESSION 3: SENSITISATION TO AEROALLERGENS AND ALLERGIC RHINITIS

O13 - Regional differences in sensitisation to ragweed in Croatian children are not associated solely with pollen concentration
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Clinical and Translational Allergy 2014, 4(Suppl 1):O13

Introduction: FP7 project ATOPICA (Atopic diseases in changing climate, land use and air quality) supported by EU Grant agreement NO: CP 282687 explores the combined pan-European impact of changes in climate, land use and air pollution on allergen pollen-induced diseases with an accent on atopy due to ragweed sensitization. Sensitization to ragweed pollen correlates with levels of airborne pollen concentration in environment, but can be enhanced by other environmental factors such as air pollution.

Material and Methods: Cohort of 3588 children, aged 4-10 years, was recruited from 3 regions of Croatia differing in airborne pollen concentrations (Slavonia, Zagreb and surrounding end Dalmatia). Each participant underwent skin prick test (SPT) to the standard set of aeroallergens. For each region, pollen concentrations and air quality data were gathered from authorized institutions.

Results: A total of 990 children were sensitized to one or more aeroallergens. Prevalence of ragweed sensitization was 14.84 % in Zagreb area, 14.26 % in Slavonia and 1.53 % in Dalmatia. Comparing the highest pollen concentrations during ragweed pollinating period among 3 regions, Dalmatia has the lowest concentration of ragweed pollen of 30-40 grains/m³, while Zagreb measures 250-300 grains/m³ and Slavonia 700-1000 grains/m³ per 24 hours. Analysis of sensitization in two age groups (4-6 and 7-10 years) reveals higher prevalence of ragweed, birch and D. pteronyssinus sensitization as well as double sensitization (birch and ragweed) in older age group for all 3 regions. Sensitization to above allergens was more prevalent in male participants.

Conclusions: Although region of Slavonia measures highest ragweed pollen concentrations, the equal portion of sensitized children was found in Zagreb and surrounding areas having 3 times lower concentrations of ragweed pollen. However, as a largest city in Croatia with a number of industrial zones in its surrounding, air pollution in Zagreb is highly present. Detailed statistical analysis on the impact of air pollution on sensitization rate is in progress.

O14 - Der p 10 as a minor allergen in children sensitised to house dust mites
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Clinical and Translational Allergy 2014, 4(Suppl 1):O14

Objective: To assess the proportion of children with specific IgE to Der p 10 in children with sensitization to house dust mites (HDM).

Material and methods: We determined specific IgE (ImmunoCAP®, Thermo Fisher Scientific) to Der p 1, Der p 2 and Der p 10 simultaneously in children with symptoms of asthma and/or rhinoconjunctivitis who had present. Detailed statistical analysis on the impact of air pollution on sensitization rate is in progress.

Conclusion: About 10% of patients sensitized to HDM had specific IgE to Der p 10. Sensitization to Der p 10 without sensitization to major allergens Der p 1 and Der p 2 appeared in 1.3% of patients, and serologically more relevant sensitization to Der p 10 in an additional 1.3% of patients. This should be considered when prescribing immunotherapy, as Der p 10 is not standardized in current vaccines.

O15 - Component resolved diagnosis: performance of specific IgE to Alternaria compared to Alt a 1
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Clinical and Translational Allergy 2014, 4(Suppl 1):O15

Objective: As the panel of molecules available for component resolved diagnosis is being expanded our objective was to compare the performance of specific IgE to Alt a 1 and to Alternaria.

Material and methods: Specific IgE (ImmunoCAP®, Thermo Fisher Scientific) to Alternaria (cost = 8 - 9 €) and to Alt a 1 (cost = 11-12 €) were measured simultaneously in children with symptoms of asthma and/or rhinoconjunctivitis who had positive skin tests to Alternaria. Values <0.35 kUA/L were considered negative.

Results: We studied 143 children (92 M/51 F) aged 2.4 - 15.6 years. Negative results were found in 20 (14%) with Alternaria, 24 (16.8%) with Alt a 1, and 19 with both (13.3%). There was a good correlation between the two determinations (r = 0.935, p <0.001). Overall the levels were higher for Alt a 1 (18.9 ± 24.4) than for Alternaria (15.4 ± 20.1). There were 97 cases (68%) with levels of Alt a 1 > Alternaria, 42 (29%) with Alt a 1 < Alternaria, and four with the same values. There was a single patient with positive Alt a 1 (0.39) and negative Alternaria (0.3), and five patients with negative Alt a 1 and positive Alternaria, with values of 0.43, 0.56, 2.3, 7.4 and 11.3, two of which are not considered very meaningful.

Conclusion: The performance of specific IgE against Alternaria and Alt a 1 in detection of positive cases is similar. Only 2% of the cases appear to be sensitized to other molecules different from Alt a 1, and could go unnoticed if only the latter determination is requested. On the other hand, current vaccines standardized in biological units are based on whole Alternaria, and those in weight/volume are based on Alt a 1.

O16 - Children with asthma and rhinitis are at a higher risk of asthma exacerbations than children with asthma only: longitudinal analysis
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Clinical and Translational Allergy 2014, 4(Suppl 1):O16

Background: There is a paucity of longitudinal data on the effect of rhinitis on asthma exacerbations during childhood. Within the context of unselected birth cohort (Manchester Asthma and Allergy Study), we investigated the association between rhinitis and asthma exacerbations from early childhood to school age.

Methods: Subjects were recruited prenatally and followed prospectively, attending follow-up at ages 3, 5, 8, and 11 years. A validated questionnaire was interviewer-administered to collect information on parentally-reported symptoms (n=1051). At each follow-up, current rhinitis was defined as sneezing, runny or blocked nose in the absence of cold or flu within the last 12 months, and asthma as a positive response to at least two of the following: 1) current wheeze; 2) physician-diagnosed asthma; 3) use of asthma medication. We measured specific airway resistance (SRaw) using plethysmography (ages 5-11 years) and FEV1 by spirometry (5, 8 and 11). Information on prescribed medication and severe asthma exacerbations (Asthma Definition) was extracted from participants’ medical records. The effect of rhinitis on asthma exacerbations and lung function was investigated using longitudinal analyses.

Results: A total of 356 children had asthma on at least one time point, of whom 198 had rhinitis. In the multivariate models adjusted for the use of intranasal and inhaled corticosteroids as well as antihistamines, asthmatic children with current rhinitis remained markedly and significantly more...
likely to have frequent asthma exacerbations (>2 per year; OR[95%CI], 12.0 [2.12-67.92], p=0.005, aOR, 4.75 [1.54-14.85], p=0.007). However, there were no differences in the longitudinal measures of FEV1 or sRaw between asthmatic children with and without rhinitis, before or after adjustment for the use of rhinitis or asthma medication.

Conclusion: In the longitudinal analysis throughout childhood, children with asthma and rhinitis were also almost five times more likely to experience severe asthma exacerbations compared to children with asthma only.

O17 - Assessment of efficacy and safety of sublingual tablets of house dust mite allergen extract in children and adolescents with allergic rhinitis

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Background: The efficacy and safety of 500IR and 300IR sublingual tablets of house dust mite (HDM) allergen extracts have been demonstrated in adults with HDM-related allergic rhinitis (AR). Here, we report the efficacy and safety of the 300IR dose in a double-blind, placebo-controlled study in children and adolescents.

Methods: Participants aged 5 to 17 years of age, with at least a 1-year history of HDM-associated AR requiring regular intake of symptomatic treatment, a positive skin prick test to HDM, HDM-specific serum IgE ≥0.7 kU/L, and an Average Rhinitis Total Symptom Score (ARTSS, scale: 0-12) ≥2 during a 7-day screening period were randomized (1:1) to receive 300IR or placebo tablets once daily for a year. Participants recorded their rhinitis symptoms and use of rescue medication. The primary efficacy endpoint, Average Adjusted Symptom Score (AAdSS), which adjusts symptom score for rescue medication use, was assessed over the last 2 months of the treatment period and analyzed by ANCOVA.

Results: 471 children and adolescents (300IR: 241, placebo: 230) were randomized. For the primary efficacy analysis, the AAdSS least-square mean difference between the 300IR and placebo groups was 0.01 (CI95%, [-0.41; 0.43]). Of note, the mean ARTSS in the placebo group was 6.7 at baseline, and dropped to 3.1 at Month 3, and to 2.3 at Month 12. The baseline, and dropped to 3.1 at Month 3, and to 2.3 at Month 12. The treatment was well tolerated. The most commonly reported adverse events (AEs) were application site reactions (oral pruritus, throat irritation), consistent with the safety profile observed in adults. No anaphylaxis or serious drug-related AEs were reported.

Conclusions: In this study, participants were insufficiently symptomatic to enable evaluation of the efficacy of the HDM sublingual tablet. This suggests that, for clinical research purposes, inclusion of children with HDM-driven AR based on self-assessments of symptom severity and positive skin or in-vitro testing is inadequate. More stringent inclusion criteria must be considered in future studies.

ORAL PRESENTATION SESSION 4: IMMUNOLOGY, INFLAMMATION AND PREVENTATIVE STRATEGIES

O19 - Changes in the balance between myeloid (mDC) and plasmacytoid (pDC) cell numbers in peripheral blood during childhood

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Background: Dendritic cells (DCs) are the most potent antigen-presenting cells, having an important role in linking innate and adaptive immunity. DCs are also critical mediators of immune tolerance and anergy, depending on the type of antigen they encounter. Peripheral blood DCs represent only the 0.1-1% of mononuclear cells and, based on their lineage origins, they can be divided into two major subsets, plasmacytoid DCs (pDCs) and myeloid DCs (mDCs). Although, the total number of all blood circulating lymphocyte subpopulations in children declines with age, previous studies performed on age-related DC changes have shown controversial results [1-4].

Material and methods: Blood samples were obtained from 43 clinically healthy children aged between 1 to 11 years old during routine examinations for minor elective surgery or routine checkups in the outpatient clinic. DCs were identified, by FACScan flow cytometry, as showing no labeling for the ‘lineage cocktail’ (fluorescein isothiocyanate (FITC)-conjugated monoclonal antibodies including CD3, CD14, CD16, CD19, CD20, CD56) and strong labeling for HLA-DR. The percentages of mDCs (CD 11+) and pDCs (CD 123+) were determined using three-colour flow cytometry and their absolute numbers were calculated by using their percentage in relation to the lymphocyte and monocyte number, as determined by differential blood count.

Results: Similarly to previous studies’ findings [2,3], we demonstrate that while mDCs do not change with age, pDCs decrease significantly with age (linear regression: p=0.0242, R²=0.1343). Moreover, the mDCs/pDCs ratio showed a significant positive correlation with age during childhood (linear regression: p=0.0044, R²=0.2092).

Conclusion: The human immune system is functional less mature during infancy and within the first years of life. Although young children show adult levels of mDCs, the dynamic changes in the balance between mDCs and pDCs during childhood may play a role in the vulnerability of young children to viral and bacterial infections.

References

O20 - Human rhinovirus replication-dependent induction of micro-RNAs in human bronchial epithelial cells

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Background: Micro-RNAs (miRNAs) are a class of small non-coding RNA molecules that function through post transcriptional regulation of gene expression by a process termed RNA interference (RNAi). RNAi-mediated targeting of viral RNAs is recognized as an antiviral defense mechanism. The epigenetic effect of miRNAs can either be direct, by interfering with virus genome, or indirect, through downregulation of type I IFN genes. The aim of this study is to identify HRV-A1B specific miRNAs in human bronchial cell line.

Method: In silico prediction of potential HRV-A1B specific human mature miRNAs was performed using two different prediction tools, miRBase and RNAhybrid. Human bronchial epithelial cells (BEAS-2B) were infected with HRV-A1B (1 MOI) along with UV inactivated HRV1B (1 MOI), zymosan (TLR4 stimulator) and Poly I:C (TLR3 stimulator). RNA was isolated at different time points and the kinetics of 8 miRNAs were evaluated. The expression of miRNAs was measured by miRNA specific RT-qPCR. The results were calculated according to the 2ΔΔCT method (F). Statistical analysis was performed using Student’s t test.
Results: Sixty two miRNAs were predicted to bind to the HRV-A1B positive strand. Eight miRNAs were selected according to their binding properties. We found replication dependent HRV-A1B specific induction in hs-miR-a (50 FI) and miR-b (24 FI) at 7 hours after HRV1B infection.

Conclusion: To our knowledge, this is the first study to demonstrate replication dependent induction of HRV-A1B specific human miRNAs in human bronchial epithelial cell line. The expression levels of hs-miR-a and hs-miR-b were HRV replication-dependent. Further experiments are needed in order to define the potential antiviral activity of the above miRNAs.

O21 - The role of DNA damage and repair in allergic airway inflammation
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Introduction: Extensive DNA damage and inefficient DNA repair might be responsible for some of the pathogenic features in patients suffering from asthma. To determine whether DNA adducts can be used as a “dosimeter” for asthma disease severity, we measured the DNA adduct levels in lung of mouse with house dust mite (HDM)-induced allergic airway inflammation, as the disease progresses. Apoptosis of airway epithelial cells is one of the most critical pathophysiological factors in the development of chronic asthma. As repairing of DNA lesions is important in preventing apoptosis, we propose that DNA repair plays an important pathophysiological role in regulating lung epithelial cell DNA damage response.

Results: We immunofluorescence-stained mice asthmatic lung tissue sections and observed an increase in DNA double strand break (DSB) markers, γH2AX and 53BP1 as compared to control. Level of DNA repair proteins that involved in homologous recombination and non-homologous end joining, were up-regulated substantially as early as 1 day-post last challenge. TUNEL assay revealed high level of DNA strand breaks in bronchial epithelium. DNA damage signaling pathway PCR array showed a reproducible increase in expression of multiple genes involved in DNA damage and repair. Treatment with glucocorticoid significantly reduced cell infiltration into airway as well as DNA damage and repair markers. To elucidate the role of DNA repair in regulating disease outcome, we treated mice with NU7441, a DNA-dependent protein kinase inhibitor, and had observed an increased DNA damage markers expression in lung and increased apoptotic level in bronchial epithelium as compared to no-drug treatment control. When DNA repair was obstructed, apoptosis of airway epithelium cells was enhanced. This indicates the important role of DNA repair in airway inflammation.

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O22 - Asian Americans demonstrate optimal compliance in CDC recommended pediatric vaccine schedule: implication of immunisation in autism causal inference
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Purpose: The Center for Disease Control and Prevention (CDC) provides the guidelines and recommendations for age-specific immunization schedule. We aimed to assess the prevalence of vaccination schedule by race/ethnicity, and to determine whether or not Asians demonstrate optimal compliance.

Methods: The CDC recommends one dose of diphtheria toxoids, acellular pertussis and tetanus (Tdap), and pneumococcal vaccines (PCV), two doses of varicella, measles, mumps and rubella (MMR) and three doses of Hepatitis B (HBV), and inactivated poliovirus to be received by age 11-12 years. We assessed age-specific recommendation adherence. Data were examined cross-sectionally on vaccination received during 2010. Chi squared statistical and multivariable logistic regression model were used.

Results: Recipients were Whites/Caucasian, 1,917 (32.7%), Blacks/African Americans (AA), 2904 (49.5%), Asian, 123 (2.3%), Hawaiian native /Pacific Islander,4 (0.1%), American Indian/Alaskan Native (AI/AN),9(0.2%), and some other race, 727(12.4%). There was overall 92.3% compliance to the recommended schedule. A significant racial variability in MMR as well as HBV were observed, Asian (98.5%), AA (98.4%) and Caucasian (97.1%), χ²(7)=20.6, p=0.01, and Asians (99.3%), AA(94%) and Caucasian (98.7%), χ²(7)=23.9, p=0.001 respectively. Asians demonstrated highest compliance in the receipt of varicella (Asians [99.3%], AA [98.6%], and Caucasian [97.1%], χ²(7)=18.7, p=0.01, and toxoid poliovirus (Asians [100%], AA [99.4%] and Caucasian [99%], χ²(7)=12.3, p=0.09). Asians (97.0%) relative to AA (93.1%) and Caucasian (91%) demonstrated the highest compliance in all vaccines combined, χ²(7)=245.5, p=0.001. Caucasians and AA, relative to Asians were 69% (Odds ratio [OR]=0.42, 95% CI, 0.15-1.14, and 58%, (OR=0.31, 95% CI, 0.11-0.85) less likely to adhere to the CDC schedule respectively. However, multivariable model indicated insignificant racial disparities between Asians and Caucasians, adjusted OR, 0.45, 99% CI, 0.08-1.11.

Conclusion: Asians demonstrated highest compliance, indicative of racial/ethnic disparities in immunization schedule as well as ecologic lack of the causal inference on the role of immunization in autism, given the lowest prevalence of autism among Asian Americans.

O23 - Functional effects of an amino-acid based formula with synbiotics in cow’s milk allergic infants
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Pre- and probiotics (synbiotics) are suggested to have beneficial effects on human health. This study describes effects of an amino acid based formula (AAF) with synbiotics in infants with cow’s milk allergy (CMA). In a double-blind controlled study, full term infants with diagnosed IgE and/or non-IgE mediated CMA received a commercially available AAF (NEO; n=56) or an AAF with synbiotics (neutral and acute oligosaccharides, Blifidobacterium breve M-16V) (NEO-SYN; n=54) for 16 weeks. Primary outcome was growth and formula tolerance; secondary outcomes were dermatological/respiratory allergic characteristics, and stool characteristics recorded in subject diaries and evaluated by a physician. Furthermore, adverse events and concomitant medications used during the study were reported. Average age of infants at inclusion was 4.5±2.4 months. Overall, NEO-SYN and NEO were equally tolerated and both supported normal growth. Both formulas reduced allergic symptoms; SCORAD decreased in both groups with no significant differences in SCORAD change over 16 weeks between both groups. Softer and yellow/brown stools were reported more frequently in the NEO-SYN group compared to more dry and green/dark brown stools in the NEO group (week 0-2, p=0.035; week 2-4, p=0.010 for stool consistency). Furthermore, the NEO-SYN group had less subjects with reported infections (p=0.008) and less subjects receiving medication for functional enteric disorders (p=0.019) both compared to the NEO group. In addition the NEO-SYN group had a lower number of infants on antibiotics (p=0.049), especially amoxicillin (p=0.004).

This study shows that an AAF with synbiotics is equally tolerated, supports normal growth and is similarly effective in the management of CMA symptoms compared to an AAF without synbiotics. Infants taking an
AAF with this symbiotic blend have different stool characteristics, less reported infections and less antibiotic use, which suggests that addition of the symbiotics to an AAF improves resistance to infections and reduces specific medication use.

**P2**

**PD02 - Observational follow-up study with the Pan-European standard prick test to determine inhalant allergen sensitisation rates in a Greek population**

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**Clinical and Translational Allergy 2014, 4(Suppl 1)\(^2\)**

**Introduction:** Skin prick testing (SPT) is the standard method for diagnosing allergenic sensitization. Correct diagnosis of inhalant allergies, requires knowledge of the most important inhalant allergen sensitizations. Few data are available regarding the prevalence of these sensitizations in Greece.

**Objective:** The prospective assessment of the inhalant allergen sensitization rates in a Greek pediatric population.

**Methods:** 196 patients 3-18 years old (median age 10.3) who referred to our outpatient department with suspected reactions to inhalant allergens were included in the study (1.6/1 male to female ratio). Data were collected on the first 20 SPT performed every month for a total period of 12 months (April 2012 to March 2013) and are herein reported for children (<18), only. Evaluation for every skin prick test occurred after 15-20 min exposure, with positive results defined as a wheal diameter.

**Results:** The seven allergens with the most common sensitization rate were revealed to be olea (32.3%), followed by Grass-mix (24.6%), cat (18.3%), mites (D. pteronyssinus (31.8%), D. farinae (23.6%)), alternaria (19.5%). These were comparable with a previous evaluation of our population. Sensitization to ragweed and birch (14.9% each) allergens was also present, although these allergens do not exist in southern Greece. 13.3% of the subjects were not sensitized to any allergen tested. Single sensitization was revealed in 18.3%, the most prevalent being mites (6.1%), olive (4.6%) and grasses (4.1%). 48% were sensitized to four or more allergens.

**Conclusion:** The application of the Pan-European panel may provide awareness for some inhalant allergen sensitizations that had not been
examined in this population before. It also suggests that some sensitizations assessed through SPTs with natural extracts, may be due to cross-reactivity, highlighting the need for component resolved diagnosis.

### PD03 - Household smoking and markers of atopic sensitisation in children: a systematic review and meta-analysis

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Clinical and Translational Allergy 2014, 4(Suppl 1):P3

**Background:** Household smoking (HS) is linked in children with development and aggravation of allergic asthma. Its influence on children's immune responses and development of allergy has not been conclusively elucidated.

**Objective:** To perform a systematic review evidence of HS on markers of allergic sensitization in children and adolescents.

**Methods:** CENTRAL, MEDLINE, and EMBASE databases were searched in November 2012. Included studies compared environmental tobacco smoke-exposed and non-exposed children and fulfilled criteria to define objective to outdoor air pollution sensitization in infants as total immunoglobulin E concentrations (ttgE), presence of specific IgE (sIgE+), and positive skin-prick tests (SPT+). A standardized protocol was used for data extraction. Resulting data were analyzed by methods of fixed or random-effect model, and generic inverse variance analysis (RefMan software).

**Results:** 8 studies of HS influence on ttgE concentration (2,603 children), 6 studies on HS and sIgE+ (19,644 children) and 14 studies of ETS and SPT (14,176 children) met the preset criteria of inclusion. Parental tobacco smoking was shown to raise ttgE concentrations by average of 27.7 IU/ml (95%CI: 7.8-47.7) and to boost the risk of atopic sensitization, as assessed by sIgE+ (OR=1.12, 95%CI: 1.00-1.25) and SPT+ (OR=1.13; 95%CI: 1.02-1.26). According to a subgroup analysis, this effect became evident in the preschool children (<7 y) (OR=1.20; and OR=1.33 for sIgE+ and SPT+, respectively).

**Conclusions:** This analysis underscores the association between HS in early childhood and augmented risk of allergic sensitization, and that early age of children is related to its harmful immune-modulating effects of parental tobacco smoking. Furthermore this study highlight again the role of environmental tobacco smoke exposure as the most important, avoidable risk factors for development of allergy in children.

### PD04 - The environmental risk factors and prevalence of childhood allergic diseases in an industrial city

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Clinical and Translational Allergy 2014, 4(Suppl 1):P4

This study aims to investigate the allergic disease (AD) prevalence for elementary school children in an industrial city of Ulsan and identify major environmental risk factors associated with AD prevalence. Data on the physician-diagnosed prevalence in the past 1 year and potential risk factors of AD (asthma, allergic rhinitis and atopic dermatitis) were collected by a questionnaire including ISAAC questions from the 2009-2010 survey of 4,067 children living in different urban environments. Exposure to outdoor air pollution was estimated by using annual mean concentrations of pollutants (PM10, O3, NO2, SO2 and CO) obtained from monitoring sites near the participant's residence.

Our survey results showed that the AD prevalence rate ranged between 26.2% and 35.9%. Children living in polluted areas (near industrial and central urban areas) had about 10% higher prevalence of AD than those living in coastal or suburban areas. The chi-square test demonstrated that this local difference was statistically significant before and after adjustment of major confounder such as parental AD history and education. The results of the logistic regression analysis showed that AD prevalence was significantly associated independently with socio-economic indices and indoor/outdoor environmental factors. The multivariate analysis indicated that statistically significant and robust association between several environmental factors (ventilation status, exposure to diesel exhaust, and outdoor PM10/O3 pollution) and the prevalence of AD was found after adjustment by confounders. The adjusted odd ratios for the AD prevalence were 1.24 (95% CI: 1.03-1.49) and 1.79 (95% CI: 1.17-2.75) with increase in PM10 level of 10 m³ and O3 level of 10 ppb, respectively.

Although there should be other risk factors for AD, our results suggest that living in polluted area and exposure to high levels of air pollutants can contribute to the increased risk of childhood AD.

### PD05 - Asthma and allergy from infancy into school age – the allergic march revisited

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**Background:** The allergic march describes a proposed natural course of allergic disease during childhood. However, different patterns of allergic morbidity have been suggested. The aim of this study was to describe the prevalence of doctor-diagnosed asthma and allergic manifestations from infancy into school age and the relationship between early manifestations and the prevalence of asthma at school age.

**Methods:** Data were obtained from a prospective, longitudinal study of a cohort of children born in western Sweden. The parents answered questionnaires at 6 months and 1, 4.5 and 8 years of age. The response rate at 8 years was 80% of the questionnaires distributed (4,051/5,044), that is 71% of the families entering the study (4,051/5,654).

**Results:** The prevalence of recurrent wheeze decreased from infancy to school age (5.4% to 3.4%), but the prevalence of doctor-diagnosed asthma increased from 2.1% in infancy to 5.7% at 8 years of age. The prevalence of doctor-diagnosed eczema was more than halved from infancy to school age (20.9%, 8.6 % and 7.9% at age 1, 4 and 8 years, respectively), while doctor-diagnosed food allergy decreased slightly (4.9%, 2.8% and 3.5%). Doctor-diagnosed rhinitis increased from 1.7 % at age 4 to 5.6 % at age 8 years. The prevalence of school age asthma increased with the number of allergic manifestations that was seen during infancy. Of those with 3 early manifestations (eczema, food allergy and wheeze treated with inhaled corticosteroids) more than 60% had doctor-diagnosed asthma at 8 years, compared with only 3% school age asthma among those who were symptom-free in infancy.

**Conclusion:** Doctor-diagnosed asthma and rhinitis increase, while eczema and food allergy decrease from infancy into school age in line with the proposed allergic march. In children with several early allergic manifestations in school age two out of three have doctor-diagnosed asthma at age 8.

### PD06 - Early elevated blood eosinophils are predictive for the development of atopic dermatitis in an atopic birth cohort

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The value of predictive markers for the development of atopic disease has long been discussed. Contributing to the discourse, we investigated the role of blood eosinophils at 4 and 30 weeks of life and their association with developing atopic dermatitis (AD) in an atopic birth cohort of 606 children enrolled in a randomized placebo controlled trial for prevention of AD.

**Methods:** The infants received the placebo controlled oral treatment with a three times daily applied bacterial lysate (ProSymbioflor®: Escherichia coli and Enterococcus faecalis) from week 5 until 7 months of life and were followed-up until 3 years of life. Blood samples for eosinophil counts were taken at 4.5 weeks and 7 months of life. Elevation of blood eosinophils was defined as counts above 5% of total leukocytes.
**Results:** At 4 weeks of life and 7 months of life, respectively, 233/559 and 107/467 infants showed elevated blood eosinophils counts in the total study group. Elevated blood eosinophils observed at 4 weeks were significantly associated with the occurrence of AD in the whole study group at the time points 7 months (p =0.0073), one year (p=0.0035), two years (p=0.0069) and three years (p=0.006) of life. This observation was seen in the active group as well as the placebo treated group. Blood eosinophil counts at 7 months of life showed only borderline significance for developing AD (p=0.06) at the same age, and blood eosinophil counts at one year of life showed no association with AD.

**Conclusion:** Elevated blood eosinophils at age 4 weeks of life seem to be of predictive value for the onset of atopic dermatitis in infancy and early childhood in a high risk birth cohort. Eosinophil counts later in infancy were less correlated with AD prevalence. Early eosinophil counts can therefore be helpful for counseling the parents but furthermore can identify target groups for interventional trials aiming at allergy prevention.

**P7**

**PD07 - TNF-α and hypoxia alter the expression of ASM cell contractile protein genes**

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**Background:** Recent research on airway smooth muscle (ASM) cell biology and function has significantly broadened our understanding of
the role these cells play in asthma. Apart from being structural contractile cells, they also have immunomodulatory properties. Dynamic multifunctional behavior of ASM cells, namely phenotype plasticity and functional diversity, is now-recognized to be directly involved with tissue inflammation that often interrelates with hypoxia in orchestrating airway remodeling and hyperresponsiveness characteristic of asthma.

**Objective:** Herein, we sought to investigate the effect of the inflammatory mediator TNF-α and/or hypoxia on the expression of the ASM cell contractile markers SMMHC (smooth muscle myosin heavy chain), MLCK (myosin light chain kinase), α2 actin and SM22.

**Method:** Primary in vitro differentiated human bronchial ASM cell cultures were incubated for 24 hours in the presence or absence of TNF-α under normoxia or hypoxia. Total RNA was extracted, reverse transcribed and mRNA expression levels of SMMHC, MLCK, α2 actin and SM22 were determined by quantitative real-time PCR.

**Results:** TNF-α remarkably increased SMMHC mRNA expression under both normoxia and hypoxia. Treatment under hypoxia, with TNF-α, or their combination decreased MLCK and SM22 mRNA levels. In contrast, α2 actin mRNA levels were not significantly affected under any of these conditions.

**Conclusion:** TNF-α and hypoxia appear to alter the expression of human bronchial ASM cell contractile protein genes, providing new insights on the complex role of ASM cells in the pathophysiology of asthma. Remarkable up-regulation of SMMHC mRNA by TNF-α is indicative of the excessive ASM hypertrophy in severe asthma.

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**P8**

**PD08 - Measuring direct and indirect airway hyperresponsiveness in young children with obstructive symptoms**

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Clinical and Translational Allergy 2014, 4(Suppl 1)P8

**Background:** Airway hyperresponsiveness (AHR) is a key feature of asthma. AHR with asthma may begin already in infancy and can be assessed by direct and indirect bronchial challenges. Most young children are not able to perform maneuvers required for spirometry but can satisfactorily perform impulse oscillometry (IOS), which needs minimal cooperation.

**Objective:** To compare bronchial challenge tests by mannitol, methacholine and exercise with oscillometric technique in young children with obstructive symptoms.

**Methods:** A total of 121 children (3.7-8.1 yr) were studied (31 with troublesome lung symptoms (TLS), 15 with bronchopulmonary dysplasia (BPD), 61 with history of early wheezing disorder and 14 healthy controls) to assess AHR by exercise test, mannitol and methacholine challenges with IOS. If the child used asthma control medication, it was stopped four weeks before the lung function tests. Tests were performed in separate days within two weeks period. AHR to exercise was defined as a ≥ 35% increase in Rrs5. For mannitol and methacholine challenges, the dose causing an increase of 40% in Rrs5 (PD40Rrs5) was calculated.

**Results:** All 121 study children performed exercise and methacholine tests. Both tests distinguished well children with TLS from others (Figure 1 and 2). Mannitol test was satisfactory completed by 88 children. Ten children (11%) had positive mannitol challenge, but the test did not distinguish the study groups (p=0.209). The children with positive exercise challenges were more reactive to methacholine compared to children with negative exercise test (p=0.004). Atopy was found in 38% of the study children.

**Conclusion:** Mannitol challenge did not distinguish the study groups of young children with obstructive lung symptoms. Methacholine test is easy to perform with IOS, shows concurrent results with exercise challenge and may thereby offer a practical aid for evaluation of troublesome lung symptoms in young children.

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**P9**

**PD09 - Association of the TNF-α -308 G>A polymorphism with clinical phenotypes of asthma in Moldovan children**

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Clinical and Translational Allergy 2014, 4(Suppl 1)P9

**Background:** Patients with asthma show a marked phenotypic variability, suggesting etiological heterogeneity and strong environmental influences. Bronchial asthma is determined by a complex interaction between genetic and environmental factors, but these mechanisms are not yet elucidated.

The aim of the study was to evaluate peculiarities of the TNFα gene polymorphism (-308 G>A) and its association with different clinical evolution of bronchial asthma in Moldovan children.

**Material and methods:** TNFα gene polymorphism (-308 G>A) was studied in 180 Moldavian children in order to assess the prevalence of the allelic variants of the gene in 90 children with asthma and 90 controls. All the patients underwent complex clinical and functional examination (spirometry with bronchodilatational test), and laboratory evaluation (molecular genetics, immunological and general tests).

**Results:** Following genotypes of the TNFα gene were identified: - TNFα -308 G/G, TNFα -308 G/A and TNFα -308 A/A. The study showed that the homozygous genotype TNFα -308 G/G has protective role, being significantly
more frequently identified in children with solitary form of asthma compared with those with allergic triad (86.2% versus 56.4%, respectively; OR = 4.83, 95% CI: 1.41 to 16.54, p<0.005). However, functionally compromised genotype TNFα-308 G/A was found more frequently in children with asthma associated with other allergic symptoms (ie, 38.5% compared with 13.8% in cases with asthma alone, p<0.05) and was observed twofold more frequently in boys with mild asthma with no associated atopic symptoms, compared to those with moderately to severe evolution of the disease (40.9% versus 20.7%, respectively; p< 0.05). Noticeably, the homozygous genotype TNFα-308 A/A group was identified only in children with allergic triad in 5.1% of cases.

Conclusion: Study results demonstrate the association of the functionally compromised genotypes of the TNF-α-308 gene with different phenotypes of asthma in Moldavian children.

P11
PD11 - Omalizumab in children: experience in the Immunological Department
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Clinical and Translational Allergy 2014, 4(Suppl 1):P11

Introduction: Omalizumab is a monoclonal antibody approved for the treatment of severe allergic asthma for patients above 6 years old in Europe, but its use has been described successfully in other IgE-mediated diseases. Objective: Evaluation of clinical response and safety of treatment with omalizumab in a pediatric population. Methods: Retrospective analysis of clinical data of pts aged <18 years at the time of initiation of treatment with omalizumab in our department from December 2009 to July 2013. We evaluate adverse reactions, clinical outcome, reduction or discontinuation of therapy according to allergic disease. Results: Ten pts were proposed to omalizumab: 8M, 2F with a mean age of 12.9 years ±3.9 [7-17]. All had bronchial asthma: 3severe allergic asthma, 3severe atopic eczema (AE), 1severe ocular allergy (OA) with risk for injury to the cornea by conjunctival edema and 1 cow’s milk protein allergy (CMA) with anaphylaxis during the protocol for oral tolerance induction (OTI). The mean duration of therapy with omalizumab was 12.3±13.35 months. The median serum total Ige Ig before treatment was 991.5kIU/L. The average values of Asthma Control Test (ACT) before and after omalizumab were 17 [15-24]. The mean Scoring Atopic Dermatitis (SCORAD) before and after omalizumab was 2 [34-90] and 24 [13-35]. The pts with EA, 1 was treated with cyclosporine, 1 azathioprine, 2 with systemic corticosteroids (SC). After an average of 2 months of treatment there was a reduction of azathioprine and after an average of 5.3 months suspension of SC and cyclosporine. Two pts that had suspended Specific immunotherapy (SI) for clinical worsening before omalizumab re-started SI without occurrence of adverse reactions.

Conclusion: There is no adverse reactions to omalizumab. Discussion: In our pediatric population, omalizumab shown to be effective and safe in patients with severe uncontrolled allergic disease, not only on asthma but also in other pathologies, allowing application of other effective therapeutics such as induction of food intolerance and SI that can change the course of the disease. Although more studies are still needed but this antibody appears to have a promising role.

P12
PD12 - Living on a farm protects from allergic rhinitis at school age
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Background: Family history plays a major role in the development of allergic rhinitis. External influences, such as a farm childhood and fish introduction have been suggested to play a protective role. The aim was to analyse early risk factors and protective factors for allergic rhinitis at school age.

Methods: The material is a prospective, longitudinal study of a cohort of children born in the region of western Sweden in 2003 where 8,176 families (38% of the birth cohort) were randomly selected. The parents answered questionnaires at 6 months, 12 months, 4 years and 8 years of age. The response rate at eight years was 80% (4,051 of 5,044 questionnaires distributed).

Results: At eight years of age, 441 children (11.3%) had used medicines for allergic rhinitis the past twelve months. The mean onset age was 5.1 year and 61.9% were boys. In a multivariate analysis of factors associated with allergic rhinitis with p<0.1, we found that living on a farm at 4% years was inversely associated with allergic rhinitis treated with medicines at 8 years (adjusted odds ratio 0.31, 95% confidence interval (0.13, 0.78)). Positive associations were seen with parental allergic rhinitis (2.73 [2.12, 3.52]), food allergy first year (2.45 [1.61, 3.75]), eczema first year (1.97 [1.50, 2.59]), neonatal antibiotics (1.75 [1.03, 2.97]) and male gender (1.35 [1.05, 1.74]).

Conclusion: In conclusion, we found that a family history of rhinitis, early food allergy, early eczema and male gender increased the risk of rhinitis at school age. Furthermore, we found a protective effect of living on a farm at preschool age, and that antibiotics neonatally increased the risk. Both findings are compatible with the hygiene hypothesis.

P13
PD13 - Gender differences in rhinitic children
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Gender differential effects on rhinitis are infrequently studied.

Aim of our study is to assess gender differences in host and environmental characteristics and in rhinitis severity level within the IBIM Pulmonary and Allergy Pediatric Clinic. A series of rhinitic (R) patients (September 2011 - May 2013) were investigated through standardized questionnaire and spirometry. Statistical analyses were performed with SPSS.

Preliminary results refer to 122 R patients: 77 males (M) (63.1%) and 45 females (F) (36.9%); age (years): 9.23 ± 3.42M vs 9.38 ± 3.02F; maternal and paternal history of rhinitis: 45.5%M vs 32.3%M (p<0.05); maternal smoking during pregnancy: 15.6%M vs 2.2%F (p<0.02); exposure to passive smoke: 49.4%M vs 33.3%F (p<0.08); exposure to only current maternal smoke: 24.7%M vs 11.1%F (p<0.070); current exposure to pet: 31.2%M vs 15.6%F (p<0.057); breast feeding (4mos): 33.8%M vs 53.3%F (p<0.034); BMI (kg/m²): 18.96±3.99M vs 17.95±2.94F (p<0.133); being overweight: 39%M vs 24.4%F (p<0.083). After stratifying by presence/absence of asthma, in those with R only (57, 46.7%): 53.3%M vs 46.7%F (p<0.067) and in those with rhinitis and asthma (RA, 65, 53.3%): 57.1%M vs 46.7%F (p<0.027); asthma severity level: intermittent, 32.5%M vs 11.1%F (p<0.008); moderate persistent, 9.1%M vs 15.6%F (p<0.063); rhinitis severity level: mild persistent 33.8%R vs 17.5%R-only (p<0.041); VAS (mean ±s.d.): 6.9±1.57 M vs 8.50±1.68 F; food allergy 36.4%M vs 48.8%F (p<0.008).

In conclusion, we have shown in a consecutive series of rhinitic patients that male gender is mainly associated with more frequent exposure to environmental and parental risk factor, burden of disease, pulmonary function tests and co-morbidity, but also with less severe rhinitis level. Further analyses on a larger series of pediatric patients are needed in order to assess the impact of gender differences on rhinitis management.

P14
PD14 - Non-interventional 2-year study of sublingual immunotherapy in children and adolescents with allergic rhinoconjunctivitis caused by grass pollen
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Background: The aim of this non-interventional study was to document the impact of a sublingual allergen immunotherapy (AIT) with Oralair 5-grass pollen tablets (Stallergenes, France) on symptom severity, use of symptomatic medication and tolerability in patients with grass pollen-induced allergic rhinoconjunctivitis (RC) over 2 years of routine medical practice. This poster focuses on the subgroups of children (4-11 yrs) and adolescents (12-17 yrs).

Methods: This prospective, open, non-controlled, non-interventional, multicenter study was conducted from September 2010 to October 2012 in Germany. Overall 1,482 patients (248 children (16.9%) 201 adolescents (13.7%)) participated in the study. The patients rated their symptoms as a combined score of severity (scale: 0 [none] – 3 [severe]) and frequency (scale: 0 [none] – 4 [very often]). In the combined RC score, the severity of rhinitis and conjunctivitis were pooled (scale: 0 [none] – 6 [severe]).

Results: During the season preceding AIT treatment 88/ 85% of children/ adolescents had used symptomatic medication. This rate dropped to 57/ 56% (1st season) and to 48/ 40% (2nd season). Likewise the RC score decreased from 4.10/ 4.05 to 1.93/ 1.97 (1st year) and to 1.39/ 1.39 (2nd year). An improvement in health status after two years of treatment was documented by 96/ 97%.

Adverse events occurred in 17.7/ 20.2% over two years of treatment. The incidence of non-fatal serious adverse events was 12/ 0.0%.

At the end of the 2nd season, 96/ 97% evaluated the tolerability of the 5-grass pollen tablets as very good or good.

For the group of monoallergic children/ adolescents, the RC score was reduced from 4.05/ 3.63 to 1.95/ 1.85 (1st year) to 1.29/ 1.10 (2nd year).

The RC score in polyallergic children/ adolescents decreased from 4.09/ 4.17 to 1.94/ 2.03 (1st year) to 1.46/ 1.50 (2nd year).

Conclusion: Based on the study results, AIT with Oralair 5-grass pollen tablets was well tolerated by children and adolescents in routine medical practice. All symptom scores and the symptomatic medication use were reduced significantly after one and two years under treatment with Oralair 5-grass pollen tablets compared to the season preceding AIT. Polyallergic children and adolescents benefited as much from AIT as from the monoallergenic ones.

Conclusion: These results show that adolescent SAR patients treated with MP29-02 experience significant relief from both their nasal and ocular symptoms. Similar beneficial effects may be expected in pediatric patients.

Poster Discussion Session 2: Food Allergy: Presentation, Diagnosis and Management

P16

PD16 - Prevalence of childhood food allergy in Canada: a focus on under-represented populations

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Background: Studies suggest individuals of low socioeconomic status (SES), immigrants, and Aboriginal peoples may have fewer food allergies than the general population. However, given the difficulty in recruiting such populations using conventional survey methodologies, the prevalence of food allergy among these populations in Canada has not been estimated.

Objectives: To compare the prevalence of food allergies among children from low-income, immigrant and Aboriginal populations to children from the general Canadian population.

Methods: Using 2006 Canadian Census data, postal codes with high proportions of low-income, immigrant, and Aboriginal populations were extracted and households randomly selected to participate in a telephone survey. Information on food allergies and demographic data was collected for all children (defined as below 18 years of age). Food allergy was defined according to self-report. Prevalence estimates were weighted using Census data to account for our targeted sampling.

Results: Between September 2010 and September 2011, 12,747 households were contacted to complete the survey, of which 6,403 responded (50.2% response rate), representing 3,271 children. Among all children, the prevalence of allergy to any food was 7.49% (95% Confidence Interval (CI), 5.93, 9.05). Children born in Canada had considerably more food allergies than those born elsewhere (7.96% (95% CI, 6.24, 9.68) versus 3.26% (95% CI, 1.46, 5.07)). The prevalence was higher for children residing in households above the low income cut-off (LICO) than below the LICO (7.81% (95% CI, 5.48, 10.14) versus 6.24% (95%CI, 4.12, 8.36)), and for children with versus without Aboriginal ancestry (7.62% (95% CI, 5.98, 9.26) versus 6.03% (95% CI, 1.30, 10.76)); however, these differences were not statistically significant due to overlapping confidence intervals.

Conclusions: Our study found that immigrant children experience fewer food allergies than Canadian-born children. Although the data suggest a trend towards a lower prevalence of food allergy among low-income and Aboriginal children, wide confidence intervals preclude definitive conclusions.
food allergy during infancy, the main allergens being egg (11%), milk (9%) and fish (7%).32% first experienced FA as preschoolers, 27% between 6-12 years and only 11% in adolescence. In 21/56 patients the first reaction was anaphylaxis. All subjects became tolerant to milk and egg before adolescence. The most common allergens in late adolescence were nuts (including peanut) (55%), fruits (25%), fish (23%) and sesame seed (9%). Nut allergy appeared in 48.4% (15/31 patients) in preschool years, in 25.8% between 6-12 years and in 25.8% during adolescence. The rates for fish allergy apportion were 69.2% (9/13 patients), 23.1% and 7.7%, respectively. Fruit allergy emerged in most patients between 6-12 years old. Only 2 patients became tolerant to fish and 3 to nuts before/during adolescence. Over half of the patients experienced at least 1 anaphylactic reaction and 20% had 2 or more. An adrenaline auto-injector was prescribed to 80% of the patients. Nevertheless, only 18% reported carrying it at all circumstances and 20% occasionally.

**Conclusion:** Nut, fish and fruits are the most common food allergens in late adolescence, the first two arising predominantly before school age and fruit allergy during school age years. Less than half of our patients report satisfactory compliance to medical advice regarding access to adrenaline auto-injectors.

**P18**

**PD18 - Filaggrin loss-of-function variants are associated with clinical reactivity to foods**

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**Clinical and Translational Allergy 2014, 4(Suppl 1):P18**

**Introduction:** The mechanism that determines the difference between asymptomatic sensitisation and clinical reactivity to food is as yet unknown. The aim of this study was to determine the effect of loss-of-function variants of the filaggrin gene on clinical reactivity, sensitisation and severity of food allergy.

**Methods:** Cases were defined as children with a positive DBPCFC to at least one food. Controls were defined as children with negative DBPCFCs to all foods tested. Specific IgE was measured by CAP-FEIA and a severity score was based on the symptoms during the DBPCFC. Four gene variants were genotyped: RS017X, S242X, 2282DleH and 2447X.

**Results:** We included 173 children and of these, 18 children were excluded due to Mendelian errors, low call rate, diagnostic indistinguishness or non-western ethnicity.

The odds ratio for having loss-of-function variants of the filaggrin gene and being clinically reactive was 4.9, which corresponds to a relative risk of 1.5. A history of eczema or specific IgE values did not change the beta coefficient of the effect of the filaggrin loss-of-function gene variants >10%, and both variables were therefore not considered to be confounders in this association.

A predictive model for clinical reactivity which included the presence of loss-of-function variants of the filaggrin gene had high specificity (98.1%) and positive predictive value (96.6%).

No associations were found between loss-of-function variants of the filaggrin gene and either sensitisation or the severity of food allergy.

**Conclusion and discussion:** Of children suspected of being food allergic, those with loss-of-function variants of the filaggrin gene are 1.5 times more likely to be clinically reactive to a food than those carrying wild type alleles. This result is not confounded by eczema or specific IgE levels. These gene variants may help predict clinical reactivity in high risk children.

**P19**

**PD19 - Co-recognition of lipid transfer protein in pollen and foods in a Greek pediatric population**

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**Clinical and Translational Allergy 2014, 4(Suppl 1):P19**

**Background:** Plant-food allergy is the food allergy most commonly found in older children and adults. Lipid transfer proteins (LTPs) are plant panallergens that are considered clinically relevant in plant-foods, especially in the Mediterranean area. An LTP syndrome, characterized by multiple, unstable reactivity to related plant-food allergy is not uncommon in the area. The peach LTP dominates the immunological response to these proteins but LTPs are present in pollens from several anemophilous plants and this has led to the suggestion that the primary sensitization to this allergen might occur through the airways, as a result of contact with one of these pollens.

**Objective:** The present study looked at the prevalence of hypersensitivity to different LTP-containing pollen sources among allergic subjects with an LTP-syndrome.

**Methods:** Twenty-three children (17 male; mean age 9.5 years) with LTP-syndrome living in Greece, underwent skin prick tests with commercial whole extracts (ALK-Abello) for peach, mugwort, plane and olive pollens.

**Results:** Skin Tests with Peach, Artemisia, Platanus and Olea extracts scored positive (≥3mm) in 23 (100%), 15 (65%), 10 (43%) and 10 (43%) subjects, respectively.

**Conclusions:** In our population mugwort, plane and olive pollen seem an unlikely source of primary LTP sensitization; the most likely primary sensitizer to this protein remains the peach (or a closely related plant-food), via the skin or the airways, in agreement with results from Northern Italy.
importance of more research to investigate the causative factors and the necessity to improve the healthcare service for this condition.

### P21

**PD21 - Diagnosis and treatment of eosinophilic esophagitis guided by micro-arrays technology**

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**Clinical and Translational Allergy 2014, 4(Suppl 1)p21**

**Background:** Eosinophilic esophagitis (EoE) is an immune-mediated disease of the esophagus characterized by symptoms related to esophageal dysfunction and histologically by an eosinophil-predominant inflammation. Multiple therapies have been suggested to be helpful in EoE including endoscopic dilation, medical therapy and withdrawal dietary but, the election of what food should be excluded is very difficult. Component-resolved diagnosis and microarray technology have been recently introduced into clinical allergy practice, and may be particularly useful in food-sensitized allergic patients.

**Methods:** We studied 67 patients suffering from EoE diagnosed by clinical symptoms and endoscopic biopsy esophageal with > 15 eosinophils/high-powered field. Microarray technique (Thermofisher scientific), including detection of 112 allergens were performed in these 67 patients, in 50 allergic controls with pollen sensitization but without digestive symptoms, and 50 healthy people.

**Results:** Only 7 of the 67 patients that suffered from EoE did not present any allergen sensitization. All control patients presented sensitization to different pollen allergens without any predominant allergen. Nevertheless, among the patients with EoE and with response to any allergen, the predominant were nCmx d 1 (Cynodon dactylon or Bermuda grass pollen) 59.5 %, and the following allergens: Lipid transfer proteins (LTPs) from peach (19.40%), hazelnut 17.91% and mugwort 19.40%. Profilins were positive in 9.5% of the patients. Among nuts, allergens from hazelnut and walnut (21.4%) were the most important. Other food allergens as Anisakis, egg or milk, only were positive in 9.5%, 2.3 and 4.7% respectively.

**Conclusions:** High sensitization to vegetable allergens is relevant among patients with EoE. The most important implicated allergens are LTPs (usually associated to severe allergic response) from nuts and fruits and antigen 1 from Cynodon dactylon. Our patients are being treated with exclusion of the implicated food and pollen specific immunotherapy with preliminary favourable results.

### P22

**PD22 - Examination about eosinophilia, cytokine and gastrointestinal allergy in the preterm infant**

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**Clinical and Translational Allergy 2014, 4(Suppl 1)p22**

**Purpose:** Several studies have shown the relationship between eosinophilia and gastrointestinal allergy in preterm infants; however, its mechanism has not yet been established. Interleukin (IL)-5 was shown to be involved in allergic inflammation by promoting eosinophil differentiation and activation and inducing basophil production. In this study, we examined the changes in eosinophil and basophil counts and the association with cytokines in low birth-weight infants showing abdominal distension with no serious symptoms such as blood in the stool and anaphylaxis. These infants were admitted to the neonatal intensive care unit (NICU) in our hospital for 1 week or more after birth.

**Methods:** Blood eosinophil and basophil counts and serum IL-5, IL-4, and IL-10 levels were measured over time and compared with the initial levels in 17 low birth-weight infants showing abdominal distension, who were admitted to the NICU in our hospital between January 2008 and the end of March 2010. The cases were examined retrospectively, including the clinical background and onset of allergy symptoms. The consent for participation in this study was obtained from each infant’s family.

**Results:** The mean gestational age was 30 weeks and 2 days (range, 24 weeks and 3 days to 38 weeks and 2 days). The mean birth weight was 1352.9 g (range, 454–2358 g). The mean age by the time of enteral feeding was 5.9 days and that by symptom onset was 20.8 days (range, 8–51 days). Sixteen of the 17 infants (94%) had eosinophilia (eosinophil count > 700/μl). Four of the 17 infants (23.5%) showed abnormally high eosinophil count (>3000/μl). The mean age for initiation of the increased eosinophil count was 22.3 days (range, 6–39 days). The mean peak eosinophil count was 2466.4/μl (range, 754–7980/μl). The serum IL-5 level was measured in 109 specimens. The eosinophil count was high in 4 infants (>4 pg/ml) who received milk during treatment. The IL-10 level tended to increase at an early stage after birth. In all the infants, serum IL-4 was less than or equal to the detection value. Immunoglobulin E (IgE) was positive in 6 infants. The final IgE was negative in the infants who received intervention by using milk as treatment.

**Conclusion:** Abnormal increase in eosinophil counts and elevated serum IL-5 levels were observed in infants with abdominal distension, which was likely to lead to delayed allergic reactions. Elevation of serum IL-5 level was similar to the change in the medical conditions, which may be effective for determining disease pathogenesis and evaluating the medical conditions.
Objective: We describe the experience of our department with positive oral food challenges (OFC) to peanut in children, over a 10-year period. Methods: Children who underwent a positive OFC to peanut between November 2001 and November 2012 in the Allergy Department of the University Hospital in Montpellier, France, were analysed with respect to demographics, history of atopic disease, specific IgE values, skin tests results and the severity of both the index reaction and the one elicited by the OFC (according to the Sampson grades of severity)[1]. Results: 69 OFC to peanut were positive in 59 (38 male and 21 female) patients, aged 3–16 years (mean age, 7.56 years). 129 OFC turned out negative over the same period of time. All the patients were atopic. The most common allergens were: grass mix (44.1%), cat and dog dander (42.6%), house dust mites (38.2%) and cypress pollen (20.5%). 24 (35.2%) patients had allergic rhinitis and 45 (66.2%) had asthma (n=26 GINA 1, n=18 GINA 2, n=1 GINA 3). 29 (42.6%) patients suffered from atopic eczema. 26 patients (41%) had no history of previous ingestion of peanuts and the avoidance regimen had been recommended either because of positive IgE and/or skin tests (in the context of atopic disease in early life) or because of reactions to cross-reactive tree nuts. 32 OFC were conducted in this population, eliciting 20 grade I reactions (62.5%), 11 (34.4%) grade II reactions and one anaphylactic shock. In the other patient group, with a clinical history of reaction to peanut itself, 29 patients (49.2%) had a history of a grade I reaction and 4 (6.7%) described grade II reactions. The 37 OFC performed in these patients were followed either by grade I or II reactions, namely the reaction was just as severe in 21 (56.7%), more severe in 13 (35.1%) and less severe in 3 patients (8.1%). The lowest eliciting dose, in terms of protein content, was 25 mg.

Conclusion: OFC provides data regarding the allergic status and the eliciting dose in patients with a suspicion of peanut allergy. Caution is mandatory, since reactions following OFC may be more severe than the index reaction, despite the slow progression of doses.

Reference

Methods: Data were obtained from the food challenge unit database of University Medical Center Groningen. We included children that had a complete DBPCFC and a history of suspected food allergy. We assessed the specificity of the symptoms according to the relative risk (RR) and the 95% confidence interval (95% CI).

Results: Individual symptoms showed a wide range of RR (1.777 to 0.809). The symptom with the highest RR was urticaria (RR= 1.977, 95% CI [1.857, 2.106]). However, the subjective symptom “strange taste” (RR= 1.923, 95%CI [1.720, 2.151]) was the seventh most specific symptom on the list. Certain symptoms, both subjective and objective, showed no significant association with a positive DBPCFC and were thus non-specific.

Conclusion: Symptoms differ in their specificity as indicated by a broad range of RRs in relation to a positive test outcome. Subjective symptoms are not less specific than the objective ones, and therefore do not lead to false positive results and overdiagnosis. Protocols on interpretation of DBPCFCs should probably be based on symptom specificity rather than whether symptoms are subjective or objective.
**Background:** Specific antibodies to cow's milk (CM) may have prognostic value in CM allergy. We hypothesized that they may also help in predicting the clinical outcome of oral immunotherapy (OIT) prior to treatment, and that changes in specific antibody levels during the therapy may reflect its efficacy.

**Methods:** We investigated 40 children aged 6-17 year with cow's milk allergy who either successfully completed OIT (n=32) or discontinued the therapy due to side effects (n=8). We analyzed in sera drawn before and after OIT specific IgA, IgG, IgG1 and IgG4 to CM, casein, beta-lactoglobulin and ovalbumin with enzyme linked immunosorbent assay, and IgE to CM and her's egg white with enzymatic fluoroimmunoassay (Pharmacia CAP system).

**Results:** Specific IgA, IgG, IgG1 and IgG4 to CM and casein, and CM specific IgE prior to OIT were higher in children who eventually discontinued the therapy compared with children who achieved desensitization (p<0.05). Side effects in the entire population were associated with high IgG, IgG1, but low IgG4 levels to ovalbumin (p<0.05). Specific IgA, IgG, IgG1 and IgG4 to CM proteins significantly increased and IgE to CM decreased from the start to end of OIT in children who achieved desensitization (p<0.01), whereas in those who interrupted OIT only IgG1, IgG1 and IgG4 to CM increased significantly (p<0.03).

**Conclusions:** High specific IgE, IgA and class IgG antibodies to CM proteins appear to predict failure to achieve desensitization in CM OIT. Specific IgA and class IgG antibodies to CM increase and CM IgE decreases during desensitization.

**P28**

**PD28 - Is other bovid mammals milk tolerated by children who have been submitted to cow's milk oral immunotherapy?**

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Hospital Sant Joan de Déu, Barcelona, Spain

Clinical and Translational Allergy 2014, 4(Suppl 1)P28

**Introduction:** Caseins cross-reactivity rises up to 90% between cow's milk (CM) and other bovid milks. There are few studies on tolerance to other mammals milk in patients submitted to cow's milk oral immunotherapy (CMIOT). AIMS: To determine the percentage of patients whom after CMIOT tolerate water buffalo (WB), goat and sheep milk proteins (MP).

To describe immunologic features which can predict allergy.

**Methods:** Inclusion criteria: children submitted to CMIOT tolerating >150cc CM daily, more than 1 year in maintenance phase. We evaluated: total IgE; skin prick test (SPT) to CMP, WB, goat and sheep's MP; specific IgE (sIgE) and IgG4 to CMP, goat and sheep's MP. Patients underwent oral food challenge (OFC) to WB, goat and sheep's MP.

**Results:** 51 children, 28 males, mean age at CMIOT 6.6 years (2.2-14.2) and 9.2 at OFC with WB, goat and sheep's MP. At OFC to WB, goat and sheep's MP: 47, 30 and 32 patients tolerated; 3, 7 and 4 non-anaphylactic reaction; 1, 12 and 11 anaphylaxis; 0, 2 and 4 didn't undergo OFC, respectively.

Significant differences between tolerant and non-tolerant in SPT to casein, goat and sheep's MP, and sIgE to CM, casein, goat and sheep's MP were observed. The area under the ROC curve for goat sIgE relating tolerance was 0.92, p<0.05; cut-off point 5.66 KU/L (80.5% sensitivity-96.3% specificity); for sheep sIgE 0.87, p<0.05; cut-off point 7.69 KU/L (80% sensitivity-86.7% specificity). CAP inhibition assays (solid phase goat and sheep, tolerant vs non-tolerant sera pools, CM as inhibitor) without significant differences although in the tolerant pool a greater inhibition is observed.

**Conclusions:** 58.8% of the patients who have undergone CMIOT tolerate other bovid MP. 92.15% tolerate WBMP. In OFC to goat and sheep's MP 23.95% have experienced anaphylaxis and only 1.96% in WBMP OFC. Our cut-off points can predict adverse events.

**P29**

**PD29 - Do we have a specialist allergy service?**

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Clinical and Translational Allergy 2014, 4(Suppl 1)P29

Allergy Services in the UK are diverse in terms of place of delivery and by whom. With current re-organization of the NHS there is a need to provide more clear definition of what constitutes a tertiary allergy service.

In an attempt to clarify our own position, we undertook a prospective evaluation of all paediatric allergy clinic attendees at Sheffield Children's Hospital during November 2012. The aim being to identify the primary diagnosis and any cofactors that would affect that condition.

**Results:** Data ascertainment occurred in 93 patients of whom 29 were new patients. IgE mediated food allergy was present in 53 children with 17 allergic to more than one food, egg allergy being most prevalent. Of these, 34 had associated atopy with 31 eczema, 21 asthma and 13 hay fever. Only 13 of the single food reactions didn't have associated atopy. Ten children were thought to have non IgE mediated disease with equal spread of skin and gastro-intestinal symptoms. Seven of the new patients had been referred due to concerns over drug allergy and 14 had a diagnosis of urticaria/angioedema (4 chronic, 3 intermittent and 7 acute). Seven children had allergic rhinitis with co-sensitisation to a number of aeroallergens. There was one case each of mastocytoma, wassp allergy and eosinophilic oesophagitis. Only 5 children were thought to be avoiding food without any good reason.

**Discussion:** Our review demonstrates the significant atopic burden of children attending our clinic. 75% of patients had complex disease (IgE food, non IgE food, chronic urticaria, drug allergy, rhinitis, other) that requires a multiprofessional approach which, at the moment, only a allergy clinic can provide (dietician, spirometry, co-located specialties). What is tertiary and secondary level allergy is more difficult to define.

**POSTER DISCUSSION SESSION 3: PEDIATRIC ALLERGY**

**P30**

**PD30 - Management of pediatric anaphylaxis - comparison between a district general hospital (DGH) and a regional centre in UK**

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1Birmingham Children’s Hospital, Birmingham, United Kingdom; 2City and Sandwell Hospital, Birmingham, United Kingdom

Clinical and Translational Allergy 2014, 4(Suppl 1)P30

**Background:** Anaphylaxis is a serious, life-threatening hypersensitivity reaction. The incidence of anaphylaxis is 4.5 per 100,000 persons per year and is reported to be increasing in recent years.

**Aims:** We analysed management of suspected anaphylaxis in children at a DGH and a regional referral center in UK.

**Methods:** A retrospective case note analysis was carried out between January 2007 and September 2012, which was compared to NICE (National Institute of Clinical Excellence) guidelines.

**Results:** We identified a total of 81 cases from the DGH of which 71 case notes were analysed and a total of 30 cases from the regional centre. Both centers' were good at documenting acute clinical features (>95%) and the circumstances prior to symptom onset (>93%). Both hospitals need to improve their documentation of time of onset of reaction (50:10%), informing about biphasic reaction (8.3-1%) and supply information regarding support groups 1.4-0%). Our study revealed no child received full discharge information according to NICE criteria.

The DGH performed better than the tertiary center in referral to specialist allergy services providing adrenaline auto injector and demonstration of auto injector.

**Conclusions:** The DGH outperformed the tertiary center likely due to availability of specialist allergy services. We endeavor to improve our management by establishment of specialist allergy services at the tertiary hospital and anaphylaxis education among all doctors.

**P31**

**PD31 - Pseudoallergic reactions to food and drugs in children with chronic idiopathic urticaria**

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Clinical and Translational Allergy 2014, 4(Suppl 1)P31
Chronic idiopathic urticaria (CIU) is a condition in which DRESS, also known as drug-induced hypersensitivity syndrome (DRESS), occurs. A low degranulation threshold of mastocytes in response to different stimuli is described. Diamin oxidase deficiency can be found in patients with CIU. In children with CIU, foods and drugs that interact with histamine metabolism can cause pseudoallergic reactions. For children few data in this field are available. Pseudoallergic reaction tends to appear at 4-6 hours after the ingestion of the culprit substance and are usually not life-threatening.

Material and methods: We present a case series of 4 children with CIU in which several urticarial episodes occurred in relation with ingestion of different foods and medication. The main causes for chronic urticaria were excluded. The possible culprit trigger was identified. Skin prick and in-draerinal tests were negative. Autologus Serum Skin was performed in 2 children, DAO serum activity and histamine plasma level were determined. An open challenge was performed 3 weeks after the elimination of the possible trigger, the avoidance of DAO inhibiting medication and the initialisation of a histamine-free diet.

Results: The CIU diagnostic was confirmed in all cases. DAO activity was found to be low in all patients. Histamine plasma level was higher than normal. Provocation tests were positive in 2 patients. Avoidance methods had a positive effect in all cases.

Conclusions: Pseudoallergic hypersensitivity reactions may be of relevance for chronic spontaneous urticaria with persistent symptoms. Patients can present urticarial episodes during treatments with molecules chemically not related. Usualy symptoms are non-reproducibles during provocation tests. We describe a case series of children with CIU and several exacerbations related to exposure to different foods and medication that had low DAO activity, high histamine plasma levels and improved after avoidance measures.

Table 1(abstract P31) Initial management

<table>
<thead>
<tr>
<th>Initial Management</th>
<th>Percent of children who received intervention (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenaline IM pre-hospital + in hospital</td>
<td>66(33, 33)</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>89</td>
</tr>
<tr>
<td>Steroids</td>
<td>87</td>
</tr>
<tr>
<td>Oxygen</td>
<td>37</td>
</tr>
<tr>
<td>Fluids</td>
<td>17</td>
</tr>
<tr>
<td>Nebulised salbutamol</td>
<td>76</td>
</tr>
</tbody>
</table>

Table 2(abstract P31) Compliance with NICE guidelines on discharge

<table>
<thead>
<tr>
<th>On discharge</th>
<th>Percent of children (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy clinic follow up planned</td>
<td>92</td>
</tr>
<tr>
<td>Issued with adrenaline auto injector</td>
<td>69</td>
</tr>
<tr>
<td>Documented training in auto injector use if given</td>
<td>73</td>
</tr>
<tr>
<td>Patients receiving discharge information fulfilling the criteria stated by NICE</td>
<td>73</td>
</tr>
</tbody>
</table>

Introduction: Chronic idiopathic urticaria (CIU) is a condition in which histamine is constantly released from activated mastocytes and basophiles. A low degranulation threshold of mastocytes in response to different stimuli is described. Diamin oxidase deficiency can be found in patients with CIU. In children with CIU, foods and drugs that interact with histamine metabolism can cause pseudoallergic reactions for children.

Objective: To determine the rate and risk factors for non-immediate type beta-lactam allergy in children with a history of allergic reaction occurring at least 1 hour after the drug intake.

Material and methods: A prospective study was performed using ENDA questionnaire in 103 children [4.8 (2.7-7.9) years, 60% male] with 124 non-immediate type hypersensitivity reactions. Prick and intradermal skin testing with major/minor determinant mixture, penicillin G, ampicillin, amoxicillin-clavulanate and the culprit drug were done. In patients with negative skin tests, patch and in-draerinal tests with late readings were done with the culprit drug. Drug provocation was performed in case of negative interventional tests.

Results: Fifteen children (14.6%) with 16 non-immediate reactions (12.9%) was diagnosed as beta-lactam allergic. The drugs responsible for non-immediate type beta-lactam allergy were amoxicillin-clavulanate (73%), sulbactam-ampicillin (6.3%), penicillin (6.3%), ceftriaxone (6.3%), cefaclor (6.3%). The diagnosis of non-immediate type beta-lactam allergy was determined by provocation tests (n=11) prick/epidermal tests (n=3), patch tests (n=2). Only angioedema was found to increase the risk for diagnosis of non-immediate type beta-lactam allergy (OR:3.8, 95%CI:1.2-11.4, p=0.009).

Conclusion: Diagnosis of drug allergy is also common in children with a history of nonimmediate reactions to beta-lactams. Classification due to timing of the reaction might not be appropriate to define the underlying pathogenesis of beta-lactam hypersensitivity since three patients had a positive skin test indicating IgE mediated beta-lactam allergy. Intradermal tests with late readings might not be practical in the diagnosis of non-immediate type beta-lactam allergy.
Method: 10-year retrospective study of patients admitted for DRESS. Cases were identified by relevant ICD codes from inpatient records. Results: 7 patients with DRESS were identified. Patients ranged from 8 to 16 years old at the time of presentation. Inciting drugs were: Bactrim (3 cases), augmentin (1), carbamazepine (1), phenobarbitone (1), sulfasalazine (1), traditional chinese medicine (1). Symptom onset ranged from 10 days to 6 weeks from the start of the inciting drug. All patients had high fever and generalized pruritic exanthenomatous rash. Two patients also had desquamative rashes, and one patient had purpuric papules. 4 patients had facial oedema, 4 patients had oral mucosis. Most patients had lymphadenopothy and hepatomegaly. 6 patients had significant eosinophilia, 5 had atypical lymphocytosis, and two had leucopenia. All patients had transaminists, most at least 10x normal, Peak ALT was 1172UI/L in one patient. None suffered liver failure. One patient developed drowsiness and persistent rotatory nystagmus. Another patient had myositis. 3 patients were tested for HHV6; only one was positive. None had acute EBV infection or reactivation.

All patients were treated with systemic corticosteroids. Doses ranged from 0.3mg/kg/day to 1.6mg/kg/day prednisolone equivalent. Most patients were weaned off steroids by 2 months. 5 patients had worsening symptoms despite oral steroids, with 2 patients requiring readmission. There were no fatalities. One patient developed TRAb+ hyperthyroidism 6 months later.

Conclusion: DRESS is a rare condition, and diagnosis may also be delayed that atorvastatin, only in high doses, is the best choice to treat severe symptoms. Consequently, early antimediator therapy should probably be given to these children.

P35
PD35 - In vitro effects of atorvastatin on function, proliferation and cytokine production of human peripheral blood mononuclear cells
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Clinical and Translational Allergy 2014, 4(Suppl 1)P35

Statins, which are used as cholesterol-lowering agents, have anti-inflammatory and immune-regulating properties. Little comprehensive analysis has been made to investigate the impact of statins on human T lymphocytes function, their proliferation and production of Th1 and Th2 cytokines. We also investigated if the immunosuppressive effects of statins are due to their impact on human T lymphocytes or professional antigen-presenting dendritic cells (DC) alone, or both.

Human peripheral blood mononuclear cells (MNC) proliferation was induced with phytohemagglutinin. Immature DC were cultivated from monocytes of healthy donors. DC maturation was induced by lipopolysaccharide (LPS; 1 μg/ml). Unstimulated and LPS-stimulated DC were treated with atorvastatin (1-10 μM). Ability to induce T cell proliferation and the secretion of cytokines were performed in mixed leukocyte reaction. Atorvastatin reduced phytohemagglutinin-stimulated MNC proliferation, dose dependently. The results showed that atorvastatin, only in high concentrations, strongly inhibit allogenic lymphocytes proliferation irrespectively which stimulators are used: immature or mature dendritic cells. Low concentrations of atorvastatin even stimulated proliferation when the immature dendritic cells were used as stimulators. Atorvastatin have influence on DC differentiation and maturation by changing expression and mean fluorescence intensity of costimulatory, adhesion and maturation molecules such as HLA-DR, CD80, CD83, CD86, CD40, CD54 and CD25. Atorvastatin affects allostimulatory activity of both immature and mature MoDC but in completely oposite way, using different DCL/Ly ratio, and change production of TNF-α by immature DC and IL-18 by mature DC and not affect IL-10 and IL-12 production. Atorvastatin decreased the level of IFN-γ, increase the level of IL-10, and not affected the level of IL-4 in DC culture supernatants when the atorvastatin was added during maturation. If the atorvastatin was added in monocyte culture, no significant change in cytokine level was observed.

Our data provide strong evidence that atorvastatin can act as an immunomodulator by reducing, but in low dosage stimulating T lymphocyte proliferation, inhibiting the immune response of Th1, decreasing the expression of co-stimulatory molecules, and changing DC cytokine secretion, which can help in better understanding how to take advantage of these new mechanistic insights in increased use of statins in therapeutic strategy in different immune/inflammatory disorders in future.
correlation with other immunological parameters regarding innate and adaptive immunity. Secondly, we aimed to consider the impact of epidemiological characteristics of the patients to the above mentioned immunological values.

Methods: Peripheral blood samples were collected from 37 children from 3 months to 16 years of age (mean age = 18 months), suffering from Atopic Dermatitis. The percentage of CD3 T cells expressing IL-2, IFNγ, IL-4 and IL-5 was assessed upon phosphor 12- myristate/ ionomycin stimulation, in the presence of monensin, by flow cytometry. We also measured the concentration of serum Immunoglobulins, total IgE, RASTs and serum concentrations of the above mentioned cytokines.

Results: We noticed that the percentage of intracellular IL-5 expression was analogous to the atopic burden of each patient but also to the percentage of CD8 cytotoxic cells in peripheral blood. The severity of Atopic Dermatitis seemed to be inversely correlated to the small age, the male gender and the bacterial skin infection. The total IgE was elevated in most of the patients and had no relation with disease severity. There was a significant correlation between intracellular IFNγ and the female gender. The serum cytokines didn’t seem to have similar correlations with their intracellular counterparts.

Synopsis: The TH2 cell-mediated immune response seems to be pivotal in Atopic Dermatitis pathogenesis. Many other factors affect the immune response, like the gender, the age, the concomitant expression of another atopic phenotype or the bacterial skin infection. The TH1/TH2 concept seems to be intensely affected by the role of TH1 cytokine IFNγ and the TH2 cytokine IL-5, which play an important role to disease dysregulation and the propensity to skin infections.

PD37 - Allergic disease may confer some protection against acute lymphoblastic leukemia?

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Clinical and Translational Allergy 2014, 4(Suppl 1):P37

Background: Acute lymphoid leukemia is the most common pediatric cancer. Several factors may be found associated with leukemic state and previous allergic disease needs to be evaluated.

Objective: To investigate a possible association between preceding history of allergy disease and high Total IgE levels with Acute Lymphoid Leukemia in children and adolescents.

Methods: A hospital-based case-control study in the northeast region of Brazil. The population included 60 patients diagnosed with non-T acute lymphoid leukemia by means of bone marrow myelogram and immunophenotyping and 120 controls selected proportionally for age and gender. Data collection employed a structured questionnaire to determine prior history of allergies, as well as total IgE serum tests and clinical evaluations.

Results: The results show that both total IgE serum levels and preceding history of asthma have a significant and inverse risk association with acute lymphoid leukemia.

In the unadjusted model, the exposure variables with a p-value < 0.20 were: asthma, high IgE levels, concomitant allergic diseases, atopic dermatitis, allergic rhinitis and urticaria. The inverse relation to both asthma and IgE serum levels continued to be significant in the adjusted model, showing significant p-value 0.044 and OR (CI 95%) of 0.14 (0.02–0.95); and p-value 0.001 and OR (CI 95%) of 0.10 (0.02–0.41), respectively.

Conclusion: High levels of total IgE, especially related to asthma, appear to contribute to alterations in the immune system, which may activate Th2-mediated pathways and this fact might confer some protective role against acute lymphoid leukemia.

PD39 - Application of population pharmacokinetic modeling and simulation in the design of the optimal dose regime of rupatadine in children 2-5 year old children

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Clinical and Translational Allergy 2014, 4(Suppl 1):P39

Background: Rupatadine is a second generation antihistamine H1 and antagonist of PAF for the treatment of allergic rhinitis and urticaria for which a new pediatric oral solution is now available for children between 6-11 y/o.

Objectives: 1) To optimize the dose regime in children between 2 to 5 y/o old to reach similar plasma concentrations to children of 6-11 y/o with allergic rhinitis.

2) To build a new population pharmacokinetic (popPK) model in children including all ages (2-11 y/o) to evaluate if the proposed regimen, as a function of weight, is adequate to reach rupatadine exposure similar to adults and ≥ 12 y/o.

Methods: A popPK model was developed, using data from 6-11 y/o study (STD I) including 11 patients with full PK profile in allergic rhinitis. A second study (STD2) including 2-5 y/o was optimal designed based on the parameters estimated from STD I, assuming inclusion of < 40 children, < 5 samples per child in the shortest time window. A final popPK model was built for children ≥ 11 years. Influence of different covariates on model parameters was also evaluated. PopPK modeling and simulation was performed in NONMEM and optimal design in Winpop software.

Results: The dose administered in STD II was 2.5 mg/kg (weight 10-25 kg) or 5 mg/kg (weight > 25 kg) and 3 samples per child were needed in a 2h time window. A two-compartmental model with first-order absorption and elimination where clearance depends on weight fitted the data for 2-11 y/o children.

Mean (SD) estimates of parameters obtained by noncompartmental analysis of the steady-state simulated plasma concentrations for both subsets of children were similar: Cmax, 2.54(1.26) vs 1.96(0.52) ng/mL; AUC,
10.74(3.09) vs 10.38(4.31) ng/mL/h; 11/2, 12.28(3.09) vs 15.94(4.09), for children 6-11 y/o and children 2-5 y/o, respectively.

Conclusion: A popPK model for rupatadine was used in the design of a new clinical study. Rupatadine clearance in children 2-11 years increases with age. The used range of doses in children provides similar exposure to rupatadine to that associated with efficacy and safety in adults and adolescents ≥ 12 y/o.

**P40**

**PD40 - A successful desensitisation to cat in a child with anaphylaxis**

Pinar Uysal,1 Cantren Bindseil-Jensen,2 Nevin Uzuner,2 Ozkan Karaman,1 Susanne Halken1

1Department of Pediatrics, Division of Allergy and Immunology, Ådnan Menderes University Hospital, Aydin, Turkey; 2Department of Dermatology and Allergy Centre, Odense University Hospital, Odense, Denmark

Introduction: Atopic dermatitis and allergic rhinitis. Anaphylactic reactions due to exposure to cats have not been reported. Herein, we report the case of an 8-year-old boy who had experienced anaphylaxis after contact with cats and successfully desensitized in the first year of immunotherapy.

Case report: He was referred with a history of suddenly occurring sneezing, urticaria, respiratory distress, wheezing and sometimes hypotension within 30 minutes after contact with cats. He had experienced those symptoms more than five times with a variety of severity in last two years. His past medical history was insignificant for asthma or any of atopic diseases. Allergen specific IgE against cat was 24 kUA/L, and negative against dog and other furred animal dander by ImmunoCAP assay (Phadia Diagnostics, Uppsala, Sweden). Skin prick test (SPT) was 5 mm for histamine, 11 mm for commercial extract of cat dander and negative for other animal dander and pollens. With regard to unconvincing history, an open challenge test was performed at hospital setting. Anaphylactic reaction with sneezing, rhinorrhea, diffuse urticaria, coughing and mild hypotension developed within 20 minutes after exposure to cat. A subcutaneous immunotherapy protocol was designed with a built-up phase of 6 months. He had no systemic reaction during immunotherapy except large local allergic reactions at injection site at built-up phase. He was evaluated for desensitization at the first year of immunotherapy by a skin prick test and provocation test without any local or systemic allergic reactions.

Conclusion: For the first time, by presenting this case anaphylactic reactions mediated by exposure to airborne cat allergens is common and mostly related with asthma and allergic rhinitis. Anaphylactic reactions due to exposure to cats have not been reported. Herein, we report the case of 8-year-old boy who had experienced anaphylaxis after contact with cats and successfully desensitized in the first year of immunotherapy.

Results: We enrolled 45 children with a mean (± standard deviation) age of 10.0 ± 3.4 years. VIT with wasp venom was initiated in 39 patients (87%) and with honeybee venom in 6 patients (13%). Seventeen patients (37.8%) had encountered local or systemic side effects during VIT. Side effects were present in 41 out of 1448 injections (2.8%). There was no significant difference at sBT levels of children with (4.3 µg/L [3.7-6.3]) or without (4.2 µg/L [3.1-4.7]) side effects (p=0.303). Multivariable logistic regression analysis revealed presence of asthma (odds ratio; 95% confidence interval) (142.2 [2.0-123.5]; p=0.008) as a significant risk factor for side effects during VIT in children.

Conclusion: Results of our study determined an association between accompanying asthma and side effects during VIT. Patients with asthma may need a particularly high degree of surveillance during VIT procedure.

**P42**

**PD42 - Is rituximab a trigger for persistent hypogammaglobulinemia in idiopathic nephrotic syndrome?**

Juan Enrique Trujillo,1 Montserrat Bosque,2 Óscar Asensio,2 Adrián Lanera,2 Juan Cristobal Rejo,2 Mireia Vilella,3 Elisabet Guijarro,2 Xavier Domingo,2 Laura Valdesoro,4 Helena Laranjo1

1Corporación Sanitaria Parc Taulí, Sabadell, Barcelona, Spain; 2Clinical and Translational Allergy 2014, 4(Suppl 1)⁴; 3Universitat Autònoma de Barcelona, Hospitalet de Llobregat, Barcelona, Spain; 4Departamento de Pediatría, Hospital Universitario de Getafe, Madrid, Spain

Introduction: Persistent hypogammaglobulinemia values usually normalizing after 11 months; persistent hypogammaglobulinemia is not a common side effect. We only found one series describing the association of persistent hypogammaglobulinemia in nephrotic patients treated with RTX, suggesting a certain predisposition in patients with low baseline IgG levels previous to the treatment with this monoclonal antibody. Starting a full immune panel previous to treatment with RTX could be a good way to predict possible persistent hypogammaglobulinemia and to rule out immunologic pathology before making any therapeutic decision.

**PD43**

**PD43 - Body fat mass is positively associated with pediatric asthma**

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Background: Since the side effects during Venom Immunotherapy (VIT) are associated with several risk factors, we aimed to evaluate the association of serum basal tryptase (sBT) levels and of other parameters with the frequency of local and/or systemic reactions during VIT in children.

Method: Children who underwent conventional VIT due to established honeybee or wasp allergy and completed 1-year VIT were included in the study. Data were collected on sBT levels, age, sex, culprit insect, degree of preceding sting reaction, time between last preceding sting reaction and VIT, venom specific IgE concentration, total IgE levels, accompanying asthma and aeroallergen sensitization.

Results: We enrolled 45 children with a mean (± standard deviation) age of 10.0 ± 3.4 years. VIT with wasp venom was initiated in 39 patients (87%) and with honeybee venom in 6 patients (13%). Seventeen patients (37.8%) had encountered local or systemic side effects during VIT. Side effects were present in 41 out of 1448 injections (2.8%). There was no significant difference at sBT levels of children with (4.3 µg/L [3.7-6.3]) or without (4.2 µg/L [3.1-4.7]) side effects (p=0.303). Multivariable logistic regression analysis revealed presence of asthma (odds ratio; 95% confidence interval) (142.2 [2.0-123.5]; p=0.008) as a significant risk factor for side effects during VIT in children.

Conclusion: Results of our study determined an association between accompanying asthma and side effects during VIT. Patients with asthma may need a particularly high degree of surveillance during VIT procedure.
Background: Prevalence of pediatric overweight/obesity and pediatric asthma has been on the rise, with both conditions currently reaching epidemic proportions. Their concurrent rise alludes to potentially common characteristics of their pathophysiological mechanisms; furthermore, excess fat mass may facilitate asthma induction via obesity-related inflammatory mediators, oxidant stress and mechanical chest restriction. However, although such a link is well-documented in adults, it is not yet established in children. We thus opted to investigate into a potential adiposity/asthma association in a cross-sectional, population-based study in preschoolers, by using several indices to assess fat mass.

Methods: Wheeze ever/in the last 12 months (current) and physician-diagnosed asthma were recorded from questionnaires filled in by the parents of 2015 children aged 9-13. Perinatal data was collected from their medical records and the questionnaires; anthropometric measurements and bioelectric impedance analysis (BIA) were conducted. Logistic regression models were built in the Statistical Package for Social Sciences (SPSS version 20.0), with the wheeze/asthma variables as main outcomes. A two-tailed p value less that 0.05, was considered statistically significant.

Results: Physician-diagnosed asthma correlated with z scores of BMI (OR=1.17 95%CI=1.05-1.31, p=0.005), waist circumference (OR=1.16 95%CI=1.03-1.32, p=0.017), waist-to-height ratio (OR=1.18 95%CI=1.04-1.34, p=0.009), sum skinfold thickness at 4 sites (biceps, triceps, subscapular, suprailiac) (OR=1.21 95%CI=1.07-1.38, p=0.002) and bioelectric impedance-derived percentage fat mass (OR=1.23 95%CI=1.07-1.40, p=0.003), following adjustment for several potential confounding factors (prenatal smoking, gestational age, birth weight, gender, parity, breastfeeding, passive smoking at home and parental educational level). Parental-reported current/ever wheeze was not associated with fat mass.

Conclusions: Body fat mass is positively linked to pediatric asthma prevalence in preadolescent children.

PD44 - In vitro fertilisation is positively associated with prevalence of asthma in childhood
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Background: Research on potential perinatal risk factors for asthma, has recently attracted considerable attention. Asthma could be associated with In vitro fertilisation (IVF) via epigenetic modification of DNA by IVF drugs/hormones or via a genetic link of asthma with parental subfertility. Nevertheless, evidence of an asthma/IVF correlation is scarce and inconclusive. We therefore opted to explore a potential link, in a cross-sectional population-based study in preadolescent children.

Methods: Wheeze in the last 12 months (current), wheeze ever, physician-diagnosed asthma and method of conception were recorded from questionnaires filled in by the parents of 2015 Greek children aged 9-13. Perinatal data was collected from their medical records and the questionnaires; anthropometric measurements were conducted. Logistic regression models were built in the Statistical Package for Social Sciences (SPSS version 20.0), with the wheeze/asthma variables as main outcomes. A two-tailed p value less that 0.05, was considered statistically significant.

Results: IVF correlated with physician-diagnosed asthma (OR=2.69, 95%CI=1.01-7.02, p=0.05) and with bioelectric impedance-derived percentage fat mass (OR=1.21 95%CI=1.07-1.38, p=0.002) and bioelectric impedance-derived percentage fat mass (OR=1.23 95%CI=1.07-1.40, p=0.003), following adjustment for several potential confounding factors (prenatal smoking, gestational age, birth weight, gender, parity, breastfeeding, passive smoking at home and parental educational level). Parental-reported current/ever wheeze was not associated with fat mass.

Conclusions: Body fat mass is positively linked to pediatric asthma prevalence in preadolescent children.

PD45 - BCG vaccination and childhood asthma: preliminary results from the Québec Birth Cohort on Immunity and Health
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It remains unclear whether Bacillus Calmette-Guérin (BCG) vaccination is related to the development of childhood asthma. Meta-analyses on this topic have come to mixed conclusions. Between 1949 and 1974, a BCG vaccination program was conducted in Quebec targeting neonates and school-age children. To investigate the effect of BCG vaccination on asthma, we assembled a retrospective cohort of subjects born in Quebec in 1974 through the linkage of several administrative medical and demographic databases. BCG vaccination status, asthma-related events (medical services, hospitalizations, emergency department visits), and potential confounders were obtained for each subject until 1994. Logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI) adjusting for gender, birth weight for gestational age, maternal smoking during pregnancy, family history of asthma, urban/rural residency. Among 90,060 individuals born in Quebec in 1974, at or after 32 weeks of gestation, probabilistic linkage resulted in a cohort of 81,496 subjects (90.5%). Vaccination or asthma status could not be determined for 4,566 subjects. Among the remaining 76,930 subjects, 51% were males. Subjects vaccinated with BCG within their first year constituted 43% of the cohort, whereas those vaccinated later amounted to 3.5%. Those who had 2 or more asthma-related medical services or at least 1 hospitalization were considered asthmatics, representing 7.7% of the cohort. A slightly lower asthma risk was observed among those vaccinated as compared with non-vaccinated subjects; the adjusted OR was 0.94 (95% CI: 0.89, 0.99). The lack of information on some potential confounding factors is a limitation. Such information has been gathered by telephone interviews with a subset of subjects, and will allow further adjustment of the measure of association. So far, these preliminary results are in support of the immunological hypothesis that BCG vaccination in early life may influence immune maturation and prevent asthma.

PD46 - Serum level of S 100 proteins in patients with asthma
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Clinical and Translational Allergy 2014, 4(Suppl 1):PD46

Aim: Asthma is a chronic disease of the lower respiratory tract that is characterized by inflammation and bronchial obstruction. The pathophysiology of the disease is related to constriction of the bronchial smooth muscle, something that is influenced by calcium homeostasis. Important role in calcium homeostasis, play various binding proteins, which belongs to the family of proteins S100 (S100). The purpose of this study was to measure S100 protein in a group of children with bronchial asthma (BA) in comparison with age-sex matched control group.

Background: Research on potential perinatal risk factors for asthma, has recently attracted considerable attention. Asthma could be associated with In vitro fertilisation (IVF) via epigenetic modification of DNA by IVF drugs/hormones or via a genetic link of asthma with parental subfertility. Nevertheless, evidence of an asthma/IVF correlation is scarce and inconclusive. We therefore opted to explore a potential link, in a cross-sectional population-based study in preadolescent children.

Methods: Wheeze in the last 12 months (current), wheeze ever, physician-diagnosed asthma and method of conception were recorded from questionnaires filled in by the parents of 2015 Greek children aged 9-13. Perinatal data was collected from their medical records and the questionnaires; anthropometric measurements were conducted. Logistic regression models were built in the Statistical Package for Social Sciences (SPSS version 20.0), with the wheeze/asthma variables as main outcomes. A two-tailed p value less that 0.05, was considered statistically significant.

Results: IVF correlated with physician-diagnosed asthma (OR=2.69, 95%CI=1.01-7.02, p=0.05) and with bioelectric impedance-derived percentage fat mass (OR=1.21 95%CI=1.07-1.38, p=0.002) and bioelectric impedance-derived percentage fat mass (OR=1.23 95%CI=1.07-1.40, p=0.003), following adjustment for several potential confounding factors (prenatal smoking, gestational age, birth weight, gender, parity, breastfeeding, passive smoking at home and parental educational level). Parental-reported current/ever wheeze was not associated with fat mass.

Conclusions: Body fat mass is positively linked to pediatric asthma prevalence in preadolescent children.
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PD47

PD47 - Visible mould and dampness are associated with new onset wheezing in New Zealand children
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Background: New Zealand has high rates of asthma and a poor standard of living, with inadequate insulation and heating leading to cold damp and often mouldy homes. The aim of the present study was to explore whether there was an association between indoor fungi and new onset wheezing in New Zealand children.

Methods: We undertook an incident case control study of 450 children. Cases were children aged 1 – 6 years recently diagnosed with wheezing and requiring treatment in the past 12 months. Each case was area, age and gender matched to two control children with no history of wheezing. The extent of visible mould was scored and mould odour and leaks were examined in the homes of the children by parents and researchers using standard methods.

Results: Researcher observed mould levels were found to be significantly higher in the bedrooms of wheezing children than control children, with every unit increase in the mould score having an increased odds ratio of wheezing of 1.28 (95% CI 1.16 – 1.42). Parental reported mould was strongly correlated with (r =0.46), but lower than researcher observed mould score (P<0.05). However, like researcher observed mould, parental observations of reported mould were significantly higher in wheezing children’s bedrooms than in control children’s bedrooms, with an increased odds ratio of 1.30 (95% CI 1.16 – 1.46) for every one unit increase in the extent of mould observed. Mould odour and leaks were also significantly associated with new onset wheezing (odour OR 1.88, 95% CI 1.20 – 2.94, leaks OR 1.71, 95% CI 1.14 – 2.58).

Conclusions: This study indicates there is a strong association of visible mould and dampness markers in the child’s bedroom with new onset wheezing in New Zealand children. However, further independent microbial markers need to be analysed to confirm the association.

PD48

PD48 - Relationship between Second Hand Smoke (SHS) exposure and atopy in social disadvantaged asthmatic children
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The evidence of a relationship between second hand smoke (SHS) exposure and atopy is inadequate. Smoke habit prevalence is higher in lower parental educational levels. The aim of this study was to investigate the relationship between second hand smoke (SHS) exposure and atopy in asthmatic children focusing on socioeconomic status (SES). We studied 170 outpatient asthmatic children with different levels of asthma (GINA guidelines). Medical history was taken in standardized way to determine prevalence of SHS exposure and maternal smoking during pregnancy. Information about the highest level of parental education was collected as a proxy of SES level. All patients underwent skin prick test (SPT) and spirometry according to international guidelines. Statistical analyses were performed using SPSS 19. 78 (45.9%) SHS exposed (SHSe) and 92 (54.1%) SHS non exposed (SHSne) asthmatic children were analyzed, aged 8.71±2.58 and 8.75±2.95, respectively. Exposure to maternal smoke in pregnancy was found only in SHSe (p <0.0001). With regard to SHSne, SHSe showed higher Body Mass Index (BMI) (19.84±4.17 vs 18.34±4.41, p <0.0044), higher percentage of the lower level of parental education (26.9% vs 13%, p <0.0252). Moreover, SHSe showed a higher percentage of current exposure to pet (29.5% vs 16.3%, p <0.044) and at least one positive SPT, mainly indoor allergens (1.89 ±1.50 vs 1.45±1.39, p <0.062). No differences were found in pulmonary function tests (PFTs) and level of asthma even if SHSe showed more exacerbations than SHSne (3.19 ±4.23 vs 1.73±2.33, p <0.067).

PD49

PD49 - Induced sputum versus exhaled nitric oxide for the evaluation of airway inflammation in allergic pediatric asthma patients treated with omalizumab
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Purpose: To determine the inflammatory changes in the airways of allergic pediatric asthma patients treated with omalizumab, measured by the percentage of eosinophil in induced sputum and exhaled nitric oxide.

Methods: From 2006 to 2012, 31 patients with asthma were treated with omalizumab (15 male -51.6%; 16 females -48.4%). Age ranged between 6-18 years. The dose of omalizumab was calculated according to the dosing table of the company. Omalizumab was administered subcutaneously in the hospital.

Protocol: Baseline analysis from every patient: Total IgE Concentration, specific IgE against the relevant allergen, the percentage of eosinophils in a smear of induced sputum and the exhaled fraction of nitric oxide (NO).

Induced sputum and NO were measured at the end of follow-up. Data are shown as mean (SEM). A Student t-test for paired data was used for comparison.

Results: Follow-up of patients was not uniform, ranging from 2-6 years. Total IgE concentration at entry: 668.89 (117.79) IU/mL; Specific IgE against the major antigen at entry: 42.15 (7.32) IU/mL; (2 house dust mite: 7 alternaria; 2 cladosporium). Initial and end induced sputum: 6.26 (2.03)% vs 2.47 (0.36)% ; (p<0.05). Initial and end NO values: 19.04 (1.98) ppb vs 18.10 (2.11) ppb (p=NS). Three patients were excluded from the evaluation due to exaggerated values in final NO measurement that preceded a severe exacerbation.

Conclusions: Omalizumab allowed a statistically significant decrease in the percentage of eosinophilin in induced sputum of this cohort of patients. Although very sensible, NO is a less reproducible and thus less reliable method to evaluate chronic airway inflammation in a pediatric allergic population with uncontrolled severe asthma. Induced sputum seems to be a better method to monitor chronic inflammation and thus the response to chronic omalizumab treatment while NO measurement would be more useful to monitor acute events preceding exacerbations.

PD50

PD50 - Impaired lung function in asthmatic schoolchildren – evaluation of risk factors
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Clinical and Translational Allergy 2014, 4(Suppl 1):PD50

In this retrospective study we investigated risk factors for impaired lung function based on medical records of asthmatic children treated in a tertiary hospital between October 2004 and December 2008. Baseline characteristics, lung function measurements and current medication were charted. Those 430 children with data on ≥2 lung function measurements performed ≥5 years apart, were included in the analyses. Altogether 91 (21%) children had abnormal findings in the first lung function measurement (n=38/265 in oscillometry performed at the median age of 4.2 years, and n=53/165 in spirometry performed at the median age of 7.6 years) and 183 (43%) in the last spirometry performed at the median age of 13.8 years. There were significant correlations between the oscillometry and last spirometry measurements: r= 0.243 between R5 z-score and FEV1 (p<0.001) (Fig.1), and r= 0.197 between R5 z-score and FEV1/FVC (p<0.001). Correlations between the first and last spirometry parameters were also significant: r=0.547 for FVCs, r=0.486 and for FEV1s, r=0.450 for FEV1/FVCs, and r=0.496 for In(MEF50%)s.
Background: Corticosteroids are the most effective anti-inflammatory therapy for asthma. A reduction in histone deacetylase (HDAC) activity is suggested to prevent the anti-inflammatory action of inhaled corticosteroids (IC). Cigarette smoke is known to reduce HDAC expression.

Aim: To compare the lung function test parameters and the response to the IC in the asthmatic children exposed and not exposed to environmental tobacco smoke (ETS).

Methodology: 527 children (6-16 years) with moderate to severe asthma underwent spirometry before and after the 6 months of IC. According to questionnaire, we divided children into two groups: ETS exposed (ETSE, N 337) and ETS free (ETSF, N 190).

Results: In all cases immunological essays were performed in order to assess specific antibodies (IgA, IgM, IgG to Mycoplasma pneumoniae and Chlamydia pneumoniae; total serum IgE levels examined using ELISA method.

Results: Serological markers for atypical pathogens were identified in 32 (59%) children investigated. Acute Mycoplasma pneumoniae infection was estimated in 13% of cases, chronic infection with Mycoplasma pneumoniae was diagnosed in 26% of children. Chlamydia pneumoniae caused acute infection in 20.4% of those investigated. Also, total serum IgE levels in children with asthma and acute infection was 1.5-fold higher than in the serologically-negative group (916.0 ±236.0 IU/mL vs. 647.9±104.6 IU/mL, respectively, p<0.05). Likewise, a significant correlation of the total serum IgE levels with IgG anti-Mycoplasma pneumoniae antibodies was identified (r=0.58; p<0.01). This indicates that Mycoplasma pneumoniae infection may be involved in mechanisms of allergic sensitization, hyper-IgE production and asthma pathogenesis in children.

Conclusions: Immunological diagnosis of infections with atypical pathogens associated with asthma exacerbations may be helpful in improving the complex management of children with asthma. It offers the possibility to use the ethiotropic antibacterial therapy that may have a positive impact on the disease severity and the level of asthma control.

PS3 - Budesonide therapy reduces sCD30-levels in atopic infants with recurrent respiratory symptoms

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Background: Infections may be involved in the development of bronchial obstruction and to increase the frequency and severity of the disease exacerbations. Studies that have been previously published showed contradictory results, thus further research on this subject need to be performed. Our study aimed to reveal immunological peculiarities in patient with asthma triggered by atypical pathogens in order to improve diagnosis and management of this category of patients.

Materials and methods: The study included 54 children aged from 1 to 18 years, hospitalized with asthma exacerbation. In all cases immunological essays were performed in order to assess specific antibodies (IgA, IgM, IgG to Mycoplasma pneumoniae and Chlamydia pneumoniae; total serum IgE levels examined using ELISA method.

Results: Serological markers for atypical pathogens were identified in 32 (59%) children investigated. Acute Mycoplasma pneumoniae infection was estimated in 13% of cases, chronic infection with Mycoplasma pneumoniae was diagnosed in 26% of children. Chlamydia pneumoniae caused acute infection in 20.4% of those investigated. Also, total serum IgE levels in children with asthma and acute infection was 1.5-fold higher than in the serologically-negative group (916.0 ±236.0 IU/mL vs. 647.9±104.6 IU/mL, respectively, p<0.05). Likewise, a significant correlation of the total serum IgE levels with IgG anti-Mycoplasma pneumoniae antibodies was identified (r=0.58; p<0.01). This indicates that Mycoplasma pneumoniae infection may be involved in mechanisms of allergic sensitization, hyper-IgE production and asthma pathogenesis in children.

Conclusions: Immunological diagnosis of infections with atypical pathogens associated with asthma exacerbations may be helpful in improving the complex management of children with asthma. It offers the possibility to use the ethiotropic antibacterial therapy that may have a positive impact on the disease severity and the level of asthma control.
(p=0.028), and in non-atopic children who received placebo (p=0.008), but no changes in sCD30 levels in atopic children treated with placebo (p=0.753), or in non-atopic children treated with budesonide (p=0.695) (Fig.1). As regards sCD26, a significant increase was seen between the levels measured before and after the 6-week intervention (p=0.012), but the increase was independent of the type of the intervention.

In conclusion, Th1-type immunity is suppressed and Th2-type immunity activated in infants with troublesome lung symptoms. However, only atopic infants may benefit of anti-inflammatory inhalants.

POSTER SESSION 1A: PEDIATRIC RHINITIS

P01 - Sensitisation pattern to inhalant allergens in Armenian children

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Background: Pediatric respiratory allergies are increasing problem in Armenia being underestimated according to official reports. Allergic Sensitization and Diseases in Armenian Children” study has been conducted to assess the prevailing sensitizations to inhalant allergens of Armenia using the standardized panel and method of PEP study (Pan-European standard Skin prick test study) conducted by Global Allergy and Asthma European Network (GA2LEN).

Objectives: To reveal prevailing sensitizations to inhalant allergens in Armenian children presenting atopy with a standardized method for diagnosis (developed by GA2LEN for European Centers), and to compare the obtained data with participant countries of PEP project.

Materials and methods: A total of 231 children aged 2-18 years applied to “Arabkir” MC with previous history or suspicion of atopy were evaluated for sensitization to inhalant allergens using standardized prick test method, allergen solutions and panel. Additional allergen (Poplar) was used for Armenia. Data were saved and analyzed in SPSS software.

Results: 192 (83%) of all investigated children had sensitization to at least 1 allergen. 31 (13% of all) children had monosensitization, 161 (70%) had polysensitization up to maximum 12 allergens. The most prevalent allergen in Armenia, as in Europe, was the grass mix: 115 (49.8%). In comparison to European countries, where Birch pollen was the 3rd important allergen, tree pollen allergens were less important for Armenia: the most prevalent one was the plane 13.4% (31). 10 allergens allowed identification of more than 95% of sensitized subjects (grass mix, Dermatophagoides pteronyssinus, dog, Alternaria, Plane, Artemisia, Hazel/Olive (or Ash), Cat/Dermatophagoides farinae). 12 allergens were needed to identify all sensitized children (grass mix, Dermatophagoides pteronyssinus, dog, Alternaria, Plane, Artemisia, Hazel/Olive (or Ash), Cat/Dermatophagoides farinae, Cladosporium/Poplar).

Conclusions: The most important inhalant allergen in Armenia was grass pollen. 10 allergens allowed the identification of the majority of sensitized children.

P03 - Mould allergy in children with allergic rhinitis in a seaside agricultural region

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Objective: Allergic rhinitis (AR) is a major chronic respiratory disease due to its prevalence, impact on quality of life (QOL), economic burden, link with asthma. During the last years, many countries have experienced an increase in the prevalence of respiratory allergy. A significant contribution in development of AR, in addition to house dust mite, cockroaches, dogs, cats, pollen and trees, seems to have mould allergens. Alternaria is predominantly an outdoor allergen favouring damp spots, and most indoor concentrations may derive from outdoor primary sources.

Methods: We conducted a retrospective case-note review of all children seen in the allergy clinic during a nine months period, with a potential diagnosis of allergic rhinitis.

Results: 138 children, aged 3 to 16 years have been seen in our allergy outpatient department during a period of 9 month, for moderate / severe allergic rhinitis, according to ARIA classification. 53 from them were
female and 85 male. Skin prick test (SPT) has been performed and they were tested for most common inhalant allergens for our region including wall pellitory, dust mite, grass mix, cat and dog, olive, Aspergillus species, Cladosporium and Alternaria standardized extract.

Twenty four children (17.4%) had a positive SPT to at least one of the three mould allergens investigated. Twelve children (8.7%) have been monosensitized only to Alternaria while 11 polysensitized (8%). Only one child was sensitized to Cladosporium, being sensitized to olive too. Previous studies showed for Greece, around 10% sensitization to moulds.

Conclusion: The high frequency of sensitization to Alternaria (16.6%) in our region could be explained by the high level of humidity (range up to 95%) due to its location, near sea-coast. Another reason could be the intensive cultivation of tomato and other legume in our region while the indoor source remains an important one.

**P59**

**P04 - Twenty year follow up: children prone to atopy and control children**

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Clinical and Translational Allergy 2014, 4(Suppl 1) P59

Introduction: Avoidance of early-life risk factors has not been successful in preventing the development of atopic symptoms /diseases and asthma.

Methods: A prospective follow-up study for 20-years was conducted in Kuopio, Finland starting the year 1981 (N=152). Intervention measures included the avoidance of house dust mite, pet dander allergens and passive tobacco smoking. Prolonged breast feeding was encouraged with formula supplementation if necessary, and introduction of solid foods was delayed until four months or later.

Results: At the age 20 years, atopic eczema was equally common despite of atopic heredity. Allergic rhinitis was significantly more common in children prone to atopy. Atopic eczema at age 2, 7 and 18 years flagged atopic eczema lasting until young adulthood, and predicted later rhino conjunctivitis (60%) and asthma at age 20y (28%). Timothy grass (65%) and birch pollen (55%) sensitization were the two common responses to findings in skin prick tests.

Heredity was the most important cause for later allergic disease. At age 20 years, however, the male gender was the most important factor for birch pollen allergy connected with atopic eczema (p=0.01) or allergic rhino conjunctivitis (p>0.04).

Conclusion: We found no effect of environmental or nutritional factors for later allergic diseases. Heredity and early atopic signs flag for later atopic diseases.

**P60**

**P06 - Pulmonary functions are affected during pollen season in children with allergic rhinitis**

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Background: With nasal symptoms, asthma-like symptoms, particularly cough, may also be present in children with pollen-induced allergic rhinitis during pollen season. The aim of this study was to evaluate whether patients with pollen-induced allergic rhinitis without a physician diagnosed asthma might, nevertheless, have airway obstruction both in and out of the pollen season.

Method: Patients with allergic rhinitis and grass pollen sensitization were evaluated both during and outside the pollen season. Allergic rhinitis diagnosis and severity grading were made according to ARIA guidelines. Skin prick tests, blood eosinophil counts and total IgE level measurements and pulmonary function tests (during and outside of pollen season) were performed in all subjects.

Results: Thirty patients (17 male, 56.7%) with a median age of 11.5 (8.7-13.6) years were included. 12 patients (40%) had mild allergic rhinitis, whereas 18 (60%) had moderate-persistent allergic rhinitis interfering with daily activities. There was no significant difference at spirometric parameters including forced vital capacity (FVC), forced expiratory volume at 1 second (FEV1), FEV1/FVC ratio, which obtained in and out of pollen season. However, the forced expiratory flow between the 25 and 75% of the vital capacity (FEF 25-75) (100 (91-96) vs. 91 (83-104)) and peak expiratory flow (PEF) (92 (83-97) vs. 82 (76-94)) values were significantly lower in pollen season when compared with the values obtained out of pollen season.

Conclusion: Pulmonary functions may be affected in children with pollen-induced allergic rhinitis during pollen season even if they have no history and symptoms of bronchial asthma.

**P61**

**P07 - Treatment load in the therapy management of allergic rhinitis: a UK retrospective database study**

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Clinical and Translational Allergy 2014, 4(Suppl 1) P61

Background: Allergic rhinitis (AR) is poorly controlled. Treated patients, even those on multiple therapies still experience symptoms. In a UK survey, 70.5% of moderate-to-severe AR patients took ≥2 medications (either fix or over the counter) in an attempt to achieve better and faster symptom relief.
To explore the extent of co-prescribing by UK general practitioners (GPs) during the hay-fever season in patients with seasonal AR (SAR), perennial AR (PAR), and comorbid asthma.

Method: A retrospective database study using the Optimum Patient Care Research Database consisting of data extracted from GP records supplemented with patient-reported outcomes from questionnaires. Patients included in the analysis had a recorded AR diagnosis and ≥1 AR therapy scripts during 1st March 2010 to 31st August 2010.

Results: In all, 22,381 AR patients were included. Results are summarized in the table.

Conclusion: There is increasing prevalence of AR and asthma associated with HDM sensitivity in Malaysia and the region. This is attributed to improvement in socioeconomic conditions, Westernized life styles and home environments conducive to proliferation of HDM and related HDM sensitivity.

### Table 1 (abstract P62)

<table>
<thead>
<tr>
<th>Therapy, n (%)</th>
<th>Season Start</th>
<th>Season End</th>
<th>Season Start</th>
<th>Season End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single therapy</td>
<td>10776 (65.5)</td>
<td>8850 (54.7)</td>
<td>4764 (76.9)</td>
<td>2974 (48.0)</td>
</tr>
<tr>
<td>Dual therapy</td>
<td>3782 (23.4)</td>
<td>5213 (32.2)</td>
<td>1172 (18.9)</td>
<td>2445 (39.5)</td>
</tr>
<tr>
<td>Triple therapy</td>
<td>1615 (10.0)</td>
<td>2062 (12.7)</td>
<td>244 (3.9)</td>
<td>694 (11.2)</td>
</tr>
<tr>
<td>Quadruple therapy</td>
<td>24 (0.1)</td>
<td>62 (0.4)</td>
<td>14 (0.2)</td>
<td>77 (1.2)</td>
</tr>
<tr>
<td>5 therapies</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>4 (0.1)</td>
</tr>
<tr>
<td>Total on combinations</td>
<td>5421 (33.5)</td>
<td>7337 (45.3)</td>
<td>1430 (23.0)</td>
<td>3220 (52.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Season End, n (%)</th>
<th>SAR (n=16187)</th>
<th>PAR (n=6194)</th>
<th>Non Asthma (n=13594)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Asthma</td>
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**Aim:** To explore the extent of co-prescribing by UK general practitioners (GPs) during the hay-fever season in patients with seasonal AR (SAR), perennial AR (PAR), and comorbid asthma.

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**Conclusion:** There is increasing prevalence of AR and asthma associated with HDM sensitivity in Malaysia and the region. This is attributed to improvement in socioeconomic conditions, Westernized life styles and home environments conducive to proliferation of HDM and related HDM sensitivity.
Background: Viral infections of the respiratory tract represent a major cause of morbidity in childhood.

The aim of our study was to identify the immunological changes in frequently ill children (FIC) with acute viral infections.

Material and methods: To this end, we examined 340 FIC with respiratory diseases and 125 seldom ill children for comparison. Patients were examined in the acute period of the disease and in the period of clinical remission. In a study of children number of CD3-cells, CD4-cells, CD8-cells, CD19-cells, the content of serum immunoglobulins A, M, G, E, the content of cytokines IL-1beta, TNF- alpha, IL-2, IL-6, IL-8, IFN-gamma, microbiocenosis upper respiratory tract and intestinal.

Results: Our results show that in the acute period of the respiratory disease, reduced the level of cellular immunity (mainly, CD3-cells, CD4-cells and the index immunoregulor cells), marked imbalance of humoral immunity reduction of IgA and IgG, increase of IgM and IgE. By the marked in cytokine status increase proinflammatory cytokines IL-1beta, TNF-alpha, IL-6, IL-8 and reducing IL-2 and IFN-gamma. We found that the clinical remission of respiratory diseases in FIC is not accompanied by a normalization parameters of the immune system and cytokine status. High level of proinflammatory cytokines in the period of clinical remission, reflect ongoing inflammation, which is associated with persistence of the infection agent. Of these infections in our patients revealed chlamydia, mycoplasma, cytomegalovirus, staphylococcus aureus, candida albicans. Our FIC 67. 6% of cases in observed dysbiosis, the severity of which correlated decrease the immune system.

Conclusion: Saved changes in the clinical remission in frequently ill children with acute viral infections requires adequate therapy.

P70
P15 - Atopy and acute urticaria in childhood: is there an association? George N Konstantinou 1,2, Stefania Totska 1, Dimitra Georgiadou 1, Maria Farin'1, Alexander Tedes 2, Despina Tsangoulou 1, Rozalia Valeri 1
1 424 General Military Training Hospital, Thessaloniki, Greece; 2 First Pediatric Department, Aristotle University of Thessaloniki, Hippokration General Hospital, Thessaloniki, Greece

Clinical and Translational Allergy 2014, 4(Suppl 1):P70

Background and objective: Acute urticaria (AU) is a common condition that often presents in childhood. In this questionnaire-based prospective study we aim to investigate if there is any association between AU and atopy.

Methods: Children up to 14 years of age presented with AU in the emergency department (ED) of a reference children’s hospital in the area of Thessaloniki were prospectively recorded. ED pediatricians filled out a relevant questionnaire per patient in the context of the taken personal medical history. Records included any doctor-diagnosed allergic disease and information derived from questions based on the International Study of Asthma and Allergies in Childhood (ISAAC) to identify any current or past allergic disease. Demographics and AU characteristics were additionally recorded.

Results: 256 AU cases (138 boys), 5.1±3.3 years old were recorded. Prevalence of AU did not differ with regards gender (P=0.376). The most common potentially associated triggers were food consumption, infections, hymenoptera stings, and vaccination. Atopy was not found to influence AU prevalence (P=0.156) or co-occurrence of angioedema (P=0.226) which presented in 35.7% of the AU patients. Moreover angioedema occurred independently of gender (P=0.086), with a trend to be more prominent in older children ages (P=0.061) and frequently associated with hymenoptera stings (P=0.001) but not so frequent in the presence of an infection (P=0.005).

Conclusions: Atopy does not appear to predispose to acute urticaria with or without angioedema in children.

POSTER SESSION 1B: URTICARIA, ATOPIC DERMATITIS AND CUTANEOUS REACTIONS

P71
P16 - A child with solar urticaria Suleyman Tülaya Yavuz, Mülteay Anılan, Burak Uğur Şimşek
Department of Pediatrics, Gülhane Military School of Medicine, Ankara, Turkey

Clinical and Translational Allergy 2014, 4(Suppl 1):P71

Introduction: Solar urticaria is a rare photodermatosis characterized by pruritus, stinging, erythema, and wheal formation after a brief period of exposure to natural sunlight or an artificial light source emitting the appropriate wavelength. Herein, we present a Turkish boy with solar urticaria.

Case report: A 9-year-old boy admitted our outpatient department suffering from urticarial lesions which develop only in the uncovered body areas, particularly in his hands and legs, within a short time after exposure to sunlight especially in the noon time. Hives were not triggered with exercise, sweating, hot water exposure or stress. His symptoms persisted for three months and urticarial lesions resolved spontaneously in less than one hour after cessation of sun exposure. Skin lesions were not accompanied by any other systemic symptoms. His family or personal history of atopy were not significant. His systemic physical examination and routine laboratory tests including basic auto-immune work up revealed no abnormal findings except grass pollen sensitivity in skin prick tests. He was diagnosed as solar urticaria and prescribed antihistamine and sun protective factors before exposure to sunlight particularly in the sunny days. He remained asymptomatic after 3-months follow-up with the help of preventive measures.

Conclusion: Solar urticaria is a rare type of photodermatoses. Polymorphic light eruptions should be considered in the differential diagnosis of solar urticaria.
diagnosis. Taking measures to avoid or minimize sun exposure is the most important step in the management of the disorder. Premedication with antihistamines are also reported to block wheal formation and minimize pruritus.

P72
P17 - A frequently encountered condition: a case of urticaria multiforme
Naile Ceral, Ilkun Bostancı
Department of Pediatric Immunology and Allergy, Dr. Sami Ulus Gynecology and Pediatrics Training and Research Hospital, Ankara, Turkey
Clinical and Translational Allergy 2014, 4(Suppl 1):P72

Introduction: Urticaria multiforme observed in pediatric patients is a morphological sub-type of acute urticaria. It consists of acute, transient, annular and polycyclic erythematous papules and plaques that do not fade when pressed. We present an eight-month-old case with urticaria multiforme.

Case report: An eight-month-old girl with fever, coughing, loss of appetite and pharyngeal hyperemia on going for five days was started on amoxicillin+clavulanic acid, but developed erythematous pruritic eruptions as well as swellings on the dorsum of her hands and feet on the fifth day of drug use. The family applied to the emergency service when the eruptions increased and began to turn purple. The infant’s temperature was determined as 38.5°C, and polycyclic papules and plaques that did not fade when pressed were observed. Some of these lesion had erythematous centers and edema was identified on the dorsum of the hands and feet. Positive laboratory findings, CMV IgM and CMV IgG to be positive and C-reactive protein and a white blood cell count were high. The patient was referred to our department of pediatric immunology and allergy by doctors at the emergency service with a prediagnosis for erythema multiforme and serum-like sickness. Based on patient history and the physical examination findings, the patient was considered as having urticaria multiforme secondary to a cytomegalovirus infection. Previous medication were discontinued and was started on first generation antihistamines. She would fully recover within a period of approximately one week. The lesions had completely vanished on the tenth day of follow-up.

Discussion: Urticaria multiforme is frequently misdiagnosed as a serum-like sickness or as urticarial vasculitis and erythema multiforme. These three diagnoses in question represent clinically different entities, each with their own specific treatment and prognosis. To ensure best patient care, pediatricians should be able to distinguish conditions that clinically mimic urticaria multiforme.

P73
P18 - Contact sensitisation in children and adolescents: the experience of the University Hospital (Hospital de Clínicas) in Uruguay
Iris S Ale*, Valeria Pomés, Patricia Leverero
Department of Allergology and Department of Dermatology, Republic University of Uruguay, Montevideo, Uruguay
Clinical and Translational Allergy 2014, 4(Suppl 1):P73

Background: Allergic contact dermatitis (ACD) is often under-recognized in the pediatric population. In the first years of life ACD it is often confused with other types of dermatitis, such as irritant dermatitis or atopic eczema (AE). In the last two decades an increase in ACD in children and adolescents was observed, reaching similar frequencies to those seen in adults (20-70%). ACD acquired in childhood may have a significant impact for patients and their families. We suggest the regular evaluation of the quality of life in the pediatric setting when the clinical presentation is suggestive of ACD.

Results: One-hundred fifty-seven children and adolescents (61% females and 39% males) were patch tested. Twenty-three percent of them were 10 years or younger. Fifty-nine percent of the children and 53 percent of the adolescents tested positive to at least one allergen. Sixty percent of these reactions were deemed to be of current relevance, 16% have probable or possible relevance, 11% past relevance and 13% of all positive reactions were of unknown relevance. The most common allergens were nickel, neomycin, thimerosal, fragrance mix, cobalt and thiuram mix. Very few irritant reactions were seen and no active sensitization was observed.

Conclusion: Contact sensitization is an important pathogenic factor for the development of dermatitis in children and adolescents. Patch testing should be utilized more frequently as a valuable diagnostic tool in the pediatric setting when the clinical presentation is suggestive of ACD.

P74
P19 - Assessment of quality of life in Uruguayan children with atopic eczema and their families
Iris S Ale*, Ingrid Rivas, Manuela Alvarez
Department of Dermatology and Department of Allergology, Republic University of Uruguay, Montevideo, Uruguay
Clinical and Translational Allergy 2014, 4(Suppl 1):P74

Background: Skin diseases produce a negative impact on the psychoemotional state, social relationships and daily activities. This effect should be particularly important during childhood, a critical period for physical and psychosocial development. However, there is a scarcity of publications on the impact of dermatological diseases in the pediatric population.

Atopic eczema (AE) is a chronic eczematous and pruritic skin disease that may affect the physical, social, and emotional functioning of the affected children as well as their families.

Methods: One hundred and twenty children (69 females and 51 males) from 6 months to 14 years old, attending the Department of Dermatology at the Pediatric University Hospital in Montevideo, Uruguay, with a confirmed diagnosis of AE -according to the criteria of Hanifin and Rajka- and their parents, entered the study. As a control group we included 100 healthy children of comparable age, gender and socioeconomic background, as well as their parents. The data collection instruments were the Children’s Dermatology Life Quality Index (CDLQI), the Infant’s Dermatitis Quality of Life Index (IDQOL) and the Dermatitis Family Impact Questionnaire (DFI). Severity of AE was assessed with the SCORAD.

Results: The median score for the IDQOL was 8.92 (range 2-23, n=66), for the CDLQI, 10.84 (0-26, n=54), and for the DFI, 8.17 (4-25, n=120). All these values were significantly different from the control subjects. There was no significant gender difference.

Conclusion: The results show that AE significantly impairs the children’s quality of life in all age groups and also the quality of life of their families. We suggest the regular evaluation of the quality of life in the clinical management of children with AE.

P75
P20 - The use of regulatory hexapeptide on frequently ill children
Malevka Karimova
Azerbaijan Medical University, Bakı, Azerbaijan
Clinical and Translational Allergy 2014, 4(Suppl 1):P75

The use of regulatory hexapeptide at frequently ill children Background. Respiratory diseases is one of the actual problems of modern pediatrics. The aim is to study clinical and laboratory level performance imunofan (regulatory hexapeptide- alpha-arginy1-lysyl-aspartyl-valyl-tyrosyl-arginine) at frequently ill children (FIC). Material and methods. To this end, 42 children were examined frequently ill with acute respiratory disease. The levels of cytokines IL-1beta, IL-2, IL-6, IL-8, TNF-alpha, IFN-gamma, serum level of substance P, condition hemostasis , of CD3, CD4, CD8, CD19 cell, content immunoglobulins A, M, G, E. It was also studied the intestinal flora, microbiocenosis nasopharynx. Results.It was found that in the acute period FIC marked increase in levels of IL-1beta, IL-6,IL-8, TNF-alpha and...
substance P, blood hypercoagulation, reduced IL-2 and IFN-γamma. Clinical remission was not accompanied by normalization of indicators. The high level of pro-inflammatory cytokines, substance P and IgM, a tendency to hypercoagulability in the period of clinical remission in FIC, reflects ongoing inflammatory process, which in our opinion, due to the persistence of the infectious agent. A significant reduction in IL-2, IFN-gamma these children, due to the presence of secondary immunodeficiency cell type. This is evidenced by the reduced number of cellular immunity (CD3, CD4, and the index of CD4 / CD8). In conclusion. Application regulatory hexapeptide- imunofan at FIC leads to positive dynamics of immunological parameters, sanitizes lasting infections, eliminates bacteria overgrowth, prevent complications and relapses. Imunofan has established itself as a drug having anti-inflammatory activity in the treatment of respiratory opportunistic infections.

P76
P21 - Evaluation of modifications in SCORMA Index and grading in the follow-up of a pediatric population with mastocytosis
Andrea Del Mastro1, Angelica Pietraroli1, Diomira Maglican2, Veronica Squeglia2, Carmela Gravante3, Alessandro Barbarino4, Giuseppe Spadaro5, Gianni Marone6,1Division of Allergy and Clinical Immunology, University of Naples Federico II, Naples, Italy; 2Division of Allergy and Respiratory Disease, Hospital of Battipaglia, Salerno, Italy; 3Division of Preventive Medicine, University of Naples Federico II, Italy

Background: Mastocytosis is a rare disease affecting both children and adults. It is characterized by accumulation of mast-cells in the skin and/or other tissues so that two main variants are distinguished: cutaneous (CM) and systemic (SM) mastocytosis. Most pediatric patients have primarily CM and complete remission will develop in a considerable number of patients during puberty. Less frequently, skin lesions persist and these patients are often diagnosed with SM in adulthood.

Our study investigates the correlation between SCORMA (SCORing MAstocytosis) Index (SC-I), a scoring system that assesses the clinical extent and intensity of cutaneous mastocytosis, and Grading system, that evaluates skin-specific symptoms and treatment status, in the follow-up of pediatric patients with mastocytosis. Furthermore, we evaluate the role of SC-I modifications in the assessment of the severity of disease.

Methods: Twenty-two patients aged less than 12 years were enrolled from our centre. SC-I and Grading were assessed for each patient at first visit and after 2 years, with determination of Grading modifications and calculation of differences in absolute value of SC-I (ΔSC-I). Data were analyzed using SPSS software. Pearson’s correlation coefficient (r) was used to assess the relationship between SC-I and Grading at first visit (r1) and after 2 years (r2). Chi-square test was performed to evaluate the association of ΔSC-I with Grading modifications, by dividing patients with SC-I changed (ΔSC-I > 10) and unchanged (ΔSC-I ≤ 10) in two groups (Grading modified and unmodified).

Results: We found p1 = 0, 47 (p < 0,05) and p2 = 0,36 (p < 0,05), while there was no statistical difference in ΔSC-I in the two groups (p > 0,05).

Conclusion: According to our data, in pediatric patients with mastocytosis SC-I and Grading show a moderate correlation at first visit which weakens significantly at the subsequent assessment after 2 years. Moreover, SC-I modifications (ΔSC-I) seem to be independent from Grading modifications and, as a consequence, from the clinical evolution of disease.

P77
P22 - Set-up and validation of a mouse model for food-allergy induced atopic dermatitis
Anneke Rijnriere1,2, Desiree Veening1, Talling Wehkamp1, Prescilla Jeurink1,2, Johan Garsen1,2, Leon KnippeLS1,2,3
1Danone Research, Centre for Specialised Nutrition, The Netherlands; 2Utrecht Institute for Pharmaceutical Sciences, Utrecht, The Netherlands; 3Clinical and Translational Allergy 2014, 4(Suppl 1):P77

Atopic dermatitis (AD) is a complex disorder characterized by flares of red and itchy skin. Infants with AD often also suffer from food allergy. Both ingestion of and skin contact with the antigen can exacerbate the AD. The affected skin is characterized by oedema formation and shows typical Th2 responses by increased levels of IL-4 and IL-13, but not IFN-γ. Furthermore, there is an influx of eosinophils and CD4+ cells. The CD4+ cells are previously described to originate from the gut mucosa where they developed upon oral sensitization to the food allergen. From both specific oligosaccharides and TLR ligands, it is clinically demonstrated that it can affect the development of AD, by skewing the immune response away from an allergic phenotype.

In this study, a mouse model to study the effect of dietary compounds on the development and treatment of food allergy-induced AD will be set-up. For this model, BALB/c mice are orally sensitized with ovalbumin (OVA; generally used to induce hen’s egg allergy) plus choler toxin adjuvant once a week, for 5 consecutive weeks. One week after the last sensitization, the mouse skin will be challenged with OVA on tape-stripped back skin. This is repeated 3 days later, and again 4 days later, the mice are sacrificed. Outcome parameters as skin thickness, inflammatory cell influx and skin mucosal cytokine levels will be studied. Following development of the AD model the effect of dietary intervention with a combination of specific OS and TLR ligands will be evaluated on the different outcome parameters.

P78
P23 - Boy with severe atopic dermatitis treated with omalizumab
Evangelia Stefanaki1, Emmanuel Manousakis1, Vassiliki Aggelakou2, Ailamis Tsimigaki1,2
1Pediatric Allergy Outpatients Clinic, Venizelion General Hospital, Heraklion, Greece; 2Allergy Department, 2nd Pediatric Clinic, University of Athens, Children’s Hospital “P. and A. Kyriakou”, Athens, Greece

Clinical and Translational Allergy 2014, 4(Suppl 1):P78

Introduction: Atopic dermatitis (AD) is a common inflammatory, itching skin disease. In a subgroup of patients, the disease is relapsing to topical therapy and systemic treatments becomes necessary. Biological agents are a new approach in AD therapy.

Methods: We describe the course of a case of severe AD under treatment with omalizumab.

Case report: Our patient is a boy 9.5 years old who has AD, vernal conjunctivitis, persistent rhinitis and asthma and is sensitized mainly to dust mites. His AD exists since infancy but became more intense since 3 years old. In 2010 he used intense moisturizing treatment and high-potency topical corticosteroids both pro actively and on demand and under these conditions his SCORAD levels were 21-32%. In the beginning of 2011 he had a persistent deterioration (SCORAD 46%) despite intense treatment. He even required admission. On May 2011 oint tacrolimus 0.1% was also started on a daily basis with only a minor improvement (SCORAD 32%). Parents were hesitant to start systemic therapy with cyclosporine and under these circumstances consultation was given from Paediatric Allergy Unit in Athens Paediatric Hospital A. and P. Kyriakou to start with omalizumab 750mg subcutaneously monthly. He started treatment in July 2011 and since then his condition improved dramatically. His SCORAD levels fell under 10% and gradually he also limited the use of corticosteroids and tacrolimus. Last season he stopped totally tacrolimus and stayed stable.

His asthma is mainly viral induced and although under treatment with omalizumab and inhaled fluticasone he still had 3 mild episode between Sep 2011-May 2012. He stopped fluticasone in July 2012 and since then he has no episode. He is also free of symptoms between episodes with normal spirometry.

His rhinitis remains mild persistent despite treatment. His vernal conjunctivitis started in 2010, was severe persistent but it is under control since 2012.

Conclusions: Our case report suggests that omalizumab might have a place in the treatment of AD refractory to the standard therapy. Our result should be confirmed in controlled studies performed in large samples.
Background: Tuberculosis remains a common condition in children worldwide. Adequate treatment requires multiple antibiotics for several months. Hypersensitivity/adverse reactions to antituberculosis drugs can interfere with continuity of treatment and result in severe reactions.

Case report: A ten years old boy was admitted for pleural tuberculosis (negative cultures, positive quantiferon assay, and father under treatment for tuberculosis). On the tenth day of treatment with isoniazid, rifampicin and pyrazinamide he developed an exuberant urticarial rash, facial oedema, fever, myalgias, oliguria and, later, conjunctival hyperemia. Laboratory results included low platelet count, hypoalbuminemia and hyponatremia. Gradual improvement occurred after suspension of treatment. One month later, drugs were gradually re-introduced (1 drug/week) but several reactions occurred: anaphylaxis 5 hours after rifampicin administration and generalized macular rash after pyrazinamide. Both drugs were suspended. Isoniazid caused an initial light generalized macular exanthema. Streptomycin, ethambutol and ciprofloxacin were introduced and well tolerated. In subsequent evaluation the child was asymptomatic, with normal analytic results and radiologic improvement. After 6 months of successful treatment, he was tested in detail for reactions to the implicated drugs.

Discussion: Reactions to antituberculosis drugs occur with variable frequency and severity, and may result from a single drug or the interaction of two or more. In this case, a severe reaction to the association of rifampicin and isoniazid seems to have occurred. Hematological disorders associated with rifampicin are a contraindication to re-introduction/tolerance induction of the drug so skin tests were not performed. Skin prick tests and intradermal tests to isoniazid were negative. Pyrazinamide reaction was only cutaneous and there are no validated tests to confirm diagnosis. This case shows the difficulty in continuity of treatment when hypersensitivity/adverse reactions occur.

Discussion: We consider the case as idiopathic. So far with excellent prognosis.

Noteworthy: The “preference” for recurrence of cellulitis at sites of initial localization and no in new positions.

Background: A growing body of evidence shows an inverse association between helminthic infestation and expression of allergy. It has been suggested that Enterobius vermicularis, the least pathogenic human intestinal nematode and the last one in westernized societies may have a modulatory effect on the human immune system.

Methods: Healthy Greek schoolchildren were investigated for E. vermicularis eggs with the adhesive-tape test. Sixty four of those, who were found parasitized and 67 matched controls were further assessed, using hematological and serological immune parameters, such as Eosinophil number (Eo count), serum Eosinophilic Cationic Protein (ECP), total and specific Immunoglobulin E (IgE) and the ratio of ECP/Eo count. In addition, certain cytokines were measured in parasitized children. These parameters were compared between non-parasitized and parasitized children, taking into account their atopic status, as well as history of clinically expressed allergic diseases.

Results: Eo count, ECP and IgE levels were found higher in parasitized than in non-parasitized children (p<0.035 for all) indicating a type 2 immune response activation during infestation. Eo count and IgE were found significantly higher in the atopic group, whereas Eo count and ECP in the nonatopic one. However, the ECP/Eo count ratio did not significantly differ between the groups compared. As expected, atopic parasitized children exhibited higher serum IgE levels (p<0.001) compared to nonatopic ones, although their IL-4 levels were paradoxically lower (p=0.030). ECP was found lower (p=0.016) in atopic children with a history of allergic disease than in those without such history, possibly indicating immunosuppression in the former group.

Conclusions: The results provide evidence that E. vermicularis elicits a protective Th2 oriented response, irrespective of the children's atopic status. The parasite seems to contribute to an environment which might downregulate immune responses in atopic subjects, more so in those with a history of allergic disease.

Background: Food protein induced enterocolitis syndrome (FPIES) with cow’s milk protein (eHF) formula. He was fed with rice protein? during the hospitalization was carried out frequent laboratory and clinical control. During the hospitalization was carried out frequent laboratory and clinical control. From the above laboratory and diagnostic work out, finding of dubious Abs for Toxocara and CRP (ranging from 3-12), is not found something important. Myelogram also was carried out without evidence. Throughout hospitalization the child was under antibiotic treatment. Each skin inflammation will subsides after the lapse of about 10 days followed by hyperpigmentation lasting about one month. The diagnosis will come eventually with skin biopsy. By far regular monitoring of the child (1½ year from the close of hospitalization) are not observed any organ damage, although the absolute number of Eo will fluctuate between 260 and 1340 cells. During the first 4 months after the last treatment the child will be implemented by our department 3 times short courses (lasting 4-7 days) treatment p.o.s K/S (dose 1-5mg/kg) in exacerbations syndrome (peripheral eosinophilia and skin cellulitis) with spectacular resolved within 4 to 5 days so as eosinophilia and skin lesions. Since then in complete remission.

Discussion: Reactions to antituberculosis drugs occur with variable frequency and severity, and may result from a single drug or the interaction of two or more. In this case, a severe reaction to the association of rifampicin and isoniazid seems to have occurred. Hematological disorders associated with rifampicin are a contraindication to re-introduction/tolerance induction of the drug so skin tests were not performed. Skin prick tests and intradermal tests to isoniazid were negative. Pyrazinamide reaction was only cutaneous and there are no validated tests to confirm diagnosis. This case shows the difficulty in continuity of treatment when hypersensitivity/adverse reactions occur.

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Background: A growing body of evidence shows an inverse association between helminthic infestation and expression of allergy. It has been suggested that Enterobius vermicularis, the least pathogenic human intestinal nematode and the last one in westernized societies may have a modulatory effect on the human immune system.

Methods: Healthy Greek schoolchildren were investigated for E. vermicularis eggs with the adhesive-tape test. Sixty four of those, who were found parasitized and 67 matched controls were further assessed, using hematological and serological immune parameters, such as Eosinophil number (Eo count), serum Eosinophilic Cationic Protein (ECP), total and specific Immunoglobulin E (IgE) and the ratio of ECP/Eo count. In addition, certain cytokines were measured in parasitized children. These parameters were compared between non-parasitized and parasitized children, taking into account their atopic status, as well as history of clinically expressed allergic diseases.

Results: Eo count, ECP and IgE levels were found higher in parasitized than in non-parasitized children (p<0.035 for all) indicating a type 2 immune response activation during infestation. Eo count and IgE were found significantly higher in the atopic group, whereas Eo count and ECP in the nonatopic one. However, the ECP/Eo count ratio did not significantly differ between the groups compared. As expected, atopic parasitized children exhibited higher serum IgE levels (p<0.001) compared to nonatopic ones, although their IL-4 levels were paradoxically lower (p=0.030). ECP was found lower (p=0.016) in atopic children with a history of allergic disease than in those without such history, possibly indicating immunosuppression in the former group.

Conclusions: The results provide evidence that E. vermicularis elicits a protective Th2 oriented response, irrespective of the children’s atopic status. The parasite seems to contribute to an environment which might downregulate immune responses in atopic subjects, more so in those with a history of allergic disease.

Background: Food protein induced enterocolitis syndrome (FPIES) with cow’s milk protein (eHF) formula. He was fed with rice protein? during the hospitalization was carried out frequent laboratory and clinical control. During the hospitalization was carried out frequent laboratory and clinical control. From the above laboratory and diagnostic work out, finding of dubious Abs for Toxocara and CRP (ranging from 3-12), is not found something important. Myelogram also was carried out without evidence. Throughout hospitalization the child was under antibiotic treatment. Each skin inflammation will subsides after the lapse of about 10 days followed by hyperpigmentation lasting about one month. The diagnosis will come eventually with skin biopsy. By far regular monitoring of the child (1½ year from the close of hospitalization) are not observed any organ damage, although the absolute number of Eo will fluctuate between 260 and 1340 cells. During the first 4 months after the last treatment the child will be implemented by our department 3 times short courses (lasting 4-7 days) treatment p.o.s K/S (dose 1-5mg/kg) in exacerbations syndrome (peripheral eosinophilia and skin cellulitis) with spectacular resolved within 4 to 5 days so as eosinophilia and skin lesions. Since then in complete remission.
Introduction: Anaphylaxis is a potentially life-threatening condition. There are limited data concerning etiology and clinical characteristics in pediatric patients.

Aim: To investigate the distribution of allergens, clinical characteristics and treatment of food anaphylaxis in a pediatric population in Brussels, Belgium.

Method: We conducted a retrospective study of 153 cases of food anaphylaxis. The patients were all referred to the department of pediatric allergology in Queen Fabiola’s Children’s Hospital from January 2008 to December 2012.

Results: Age at the time of anaphylactic reaction ranges from 1 month to 15 years (median age 37 months), with 71 patients younger than 3 years (46.4%). There is a male predominance representing 58.5% of the cases. The most commonly involved allergens are: peanut (31/153, 20.3%), tree nuts (31/153, 20.2%), cow’s milk (26/153, 17%), eggs (24/153, 15.7%), fish (9/153, 5.8%) and shellfish (8/153, 5.2%). Reported symptoms are: cutaneous (136/153, 88.9%), respiratory (98/153, 64%), gastrointestinal (90/153, 58.8%) and neurological (53/153, 34.6%). 97 reactions were severe with Sampson’s scores 4-5, representing 63.4% of our cases. Most of the children were treated with antihistaminic medication (91/153, 59.5%), corticoids (43/153, 28.1%), beta2-mimetics (32/153, 20.9%) and adrenaline (18/153, 11.8%). Only 17.7% of the patients used their anaphylactic emergency kit already prescribed. Hospitalization was decided in 20 cases (13.1%).

Conclusion: Food anaphylaxis occurred before 3 years old in almost half of the cases. Incriminated foods allergens are peanut, tree nuts, cow’s milk, eggs, fish and shellfish. In 11.1% of the cases cutaneous symptoms were absent. Adrenaline was administrated in only 11.8% of the cases and 13.1% of patients were admitted to hospital. These results highlight the fact that food anaphylaxis is not treated as recommended. Education information needs to be tailored to parents and we need to stress out that adrenaline remains the primary treatment.

Table 1: Results of the atopy patch test

<table>
<thead>
<tr>
<th>Atopy patch test</th>
<th>With cow’s milk</th>
<th>With HRPF</th>
<th>With native rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Case 2</td>
<td>Positive</td>
<td>Not done</td>
<td>Positive</td>
</tr>
<tr>
<td>Case 3</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Case 2 was a boy with atopic dermatitis during exclusive breast-feeding. At age 4 months, feedings of an HRPF were introduced episodically. At 41/2 months, the child presented to clinic with a typical FPIES (an acute episode of vomiting, lethargy and pallor) after drinking a bottle of HRPF. Breast-feeding was prolonged and an AAF introduced with success. Case 3 was a 3-month old boy who presented with gastro-oesophageal reflux associated with a severe food impaction during exclusive breast-feeding. These symptoms disappeared with CMP exclusion in the mother’s diet. At age 4 months, a HRPF was introduced and 15 days later, the infant presented with gastro-oesophageal reflux, difficulty feeding and failure to thrive. The formula was changed to an AAF and symptoms disappeared in a few days.

The results of the atopy patch test are presented in the table below. A sensitisation to rice was observed in case 1 and 2, but parents denied a challenge with rice.

Conclusions: Some children with non-IgE mediated CMA and digestive symptoms do not tolerate HRPF and must be fed with an AAF. More studies are necessary to determine whether the HRPF induces only a sensitization or a real food allergy.

P86

Background: Wheat allergy is one of the most common food allergies in children, yet few data are available regarding its natural history.

Objectives: To define the natural course of wheat allergy in Greek children and identify factors that may predict outcome.

Methods: We completed a retrospective medical record review of patients from the Allergy Clinic, 2nd Pediatric Clinic, University of Athens that were diagnosed as having wheat allergy. Patients were included in the study if they had a history of symptomatic reaction to wheat and or a positive wheat IgE test result. Clinical history, laboratory results, and final outcome were recorded for 70 patients. Resolution of wheat allergy was based on food challenge results. Total IgE, wheat IgE (F4), specific gluten IgE (F79) and the ratio F4/IgE (at presentation), were compared between children with active or resolved wheat allergy, 4 years after their first reaction, performing the non-parametric Mann-Whitney test.

Results: Rates of resolution were 20% by 5 years, 35% by 10 years (determined by Kaplan-Meier survival curves). Higher total IgE, F4, F79 or F4/IgE levels (at presentation) were not strongly associated with poorer outcomes at 4 years. F79 (p = 0.0095) and F4 (p = 0.063) slightly correlated with active allergy. Median age of first reaction to wheat was 8 months. History of AD was present at 96% of all children. Children with still active wheat allergy accounted for the 72% of the population and 75% of them had no history of other food allergy. In contrast, all children with resolved wheat allergy had multiple food allergies.

Conclusion: The mean age of resolution of wheat allergy is approximately 11 years in this population (95% CI : 9.6-12.3). In a significant percentage of patients, wheat allergy persists into adolescence. Many children outgrow wheat allergy with even the highest levels of specific wheat IgE. Monosensitization to wheat appears to be a risk factor for persistence.

P87

Introduction: Anaphylaxis is a potentially life-threatening condition. There are limited data concerning etiology and clinical characteristics in pediatric patients.

Aim: To investigate the distribution of allergens, clinical characteristics and treatment of food anaphylaxis in a pediatric population in Brussels, Belgium.

Method: We conducted a retrospective study of all registered diagnoses of anaphylaxis in our unit between 2011 and 2012 in children up to 14 years-old.

Material and methods: We performed a retrospective study of all registered diagnoses of anaphylaxis in our unit between 2011 and 2012 in children up to the age of 14. We included all patients who had anaphylaxis in these years, both new patients and follow-up visits.

Results: We found 41 patients in total, with an average age of 5 years and 11 months (2 months-14 years). 27 (66%) patients were boys and 14 (34%) patients were girls. In all cases of anaphylaxis, symptoms were due to one or several foods except one, which was due to an antibiotic (amoxicillin). The foods involved were nuts (15,36.6%), egg (8,19.5%), fruits (5,12.2%), LTP syndrome (3,7.3%), cow’s milk proteins, vegetables and seafood (2,4.9%) and cereals, fish, goat and sheep milk, potatoes and mushrooms (1, 2.4%). When we reviewed the causes of anaphylaxis by age-group we found that in children under three years the most frequent cause was the egg followed by nuts, in children 3 to 6 years the most frequent cause were nuts and in children 6 to 14 years the causes were more varied. In 18 patients (43%) other allergic diseases were present (food allergy, respiratory allergy, atopic dermatitis and sensitizations without clinical symptoms). The most frequent symptoms were cutaneous symptoms associated with gastrointestinal clinic.

Conclusion: The most frequent causes of anaphylaxis in our unit in the pediatric age are nuts and egg. The appearance of anaphylaxis is higher in children younger than 3 years and in males.

P88

Objective: To determine the number of early diagnoses of anaphylaxis and its causes during the years 2011 and 2012 in children up to 14 years-old.

Material and methods: We performed a retrospective study of all registered diagnoses of anaphylaxis in our unit between 2011 and 2012 in children up to the age of 14. We included all patients who had anaphylaxis in these years, both new patients and follow-up visits.

Results: In 11 patients, symptoms did not fit the criteria of anaphylaxis, 36 patients had anaphylaxis, 19 patients had anaphylaxis in the first year, 17 patients had anaphylaxis in the second year and 10 patients had anaphylaxis in both years.

Conclusion: The incidence of anaphylaxis in children up to 14 years-old is 23%. The most frequent cause of anaphylaxis is peanuts (25%) followed by fish (22%).
**P89**

**P34 - Food-induced anaphylaxis in children: most common triggers in the Czech Republic**

Simona Belchvikova, Radka Kabinova, Tereza Pospiskilova, Martin Fuchs

**Introduction:** Food is one of the most common causes of anaphylaxis responsible for more than 50-75% of anaphylactic cases in children. Most frequently implicated foods in childhood are milk, egg, nuts, sesame, fish and shellfish worldwide. There are some differences in incidence of types of food allergy in different areas. We tried to describe most common food anaphylactic triggers in patients of regional outpatient allergic clinic.

**Methods:** 139 patients with history of allergic reaction to food fulfilling diagnostic criteria for anaphylaxis were prospectively included. 83 of them were children. We recorded the type of food responsible for reaction, threshold doses eliciting the reaction, levels of specific IgE against food. We performed skin prick tests with native foods and in some patients also levels of specific IgE against components.

**Results:** Not surprisingly, the most common triggers of food induced anaphylaxis in our children group were milk, peanut, tree nuts and egg (32%, 29%, 26% and 18%, resp.). Poppy seed, very uncommon cause of food allergy across the Europe, elicited food anaphylaxis in 14% of our children patients, usually with severe symptoms and low thresholds. In our group of adult patients, 25% patients with food anaphylaxis reacted to poppy seed.

**Discussion:** Although poppy seed allergy is very rare around the world, it represents a common cause of food allergy and anaphylaxis in Czech Republic. Poppy seed allergens, described and included into allergen databases, are Pap s, Pap s 1 (Bet v 1 like), Pap s 2 (profilin) and Pap s 34. Allergic reaction to poppy seed are usually severe and patients react both to fresh and heated food. Therefore, most likely, poppy seed reactions are caused by some different, termostable, proanaphylactic allergens (likely belonging to seed storage protein families), than Bet v 1 or profilin homologous allergens.

**P95**

**P40 - Double-blind, placebo-controlled, food challenges (DBPCFC) of a strong tasting food: lessons learned**

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**Clinical and Translational Allergy 2014, 4(Suppl 1)**P95

**Background:** Recommendations/regulations dictate the testing of hypoallergenic formula in allergic patients prior to marketing. The purpose of this study was to generate DBPCFC data on a casein hydrolysate-based infant formula (EF). It also provided information useful for conduct of DBPCFC of strong tasting foods.

**Methods:** 9 children (1.1-4.7 yr) with documented IgE-mediated cow milk (CM) allergy participated. DBPCFC were performed over a 3-d period in hospital using procedures described by Sampson et al (J Pediatr;118:520). A DBPCFC was performed on each of the first 2 d. Day 3; an open challenge of EF was done. Challenges were 100 mL of placebo (P) formula (Nutramigen® liquid, Mead Johnson Nutritionalis, Evansville, IN) or EF (Nutramigen containing 8 g freeze-dried Similac® Alimentum®, Abbott Nutrition (AN), Columbus, OH). Flavoring (chocolate or strawberry syrup) was optional and, if chosen, used in all challenges.

**Results:** At entry 6 subjects received a challenge to CM with positive results. The amount of CM protein eliciting a response ranged from 0.063-1.54 g. 3 subjects had a repeat reaction to CM due to accidental exposure just prior to entry and were not re-challenged. 8 subjects successfully completed the DBPCFC and open feeding of EF; 1 with a history of anaphylaxis to CM reacted to P and EF (both with chocolate syrup). 3 mo later, the subject returned for repeated DBPCFC because the syrup was suspected. The subject experienced a reaction to EF with strawberry syrup and was not challenged with P. These challenges were judged to be “inconclusive” because it was impossible to ascertain if the child experienced a reaction to P, EF, and/or the syrup(s).

**Conclusion and next steps:** These data, along with those from Sampson et al (1991), were used to support current recommendations for hypoallergenic labeling for EF to document that with 95% confidence, EF was tolerated by at least 90% of individuals documented to be allergic to cow milk (CM) protein. It is recommended that challenge mixtures not include other foods or flavorings that have the potential to elicit allergic reaction individually.

**Acknowledgements:** Supported by AN, Abbott Laboratories.

**P96**

**P41 - Preexposure prophylaxis of infants’ food allergy**

Svetlana Denissova, Vera Reysjaka, Tatiana Sentsova, Marina Belitskaya, Elena Pavlovskaya, Ilya Vorozhko

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**Clinical and Translational Allergy 2014, 4(Suppl 1)**P96

**Background:** The problem of food allergy remains actual till now, and demands further development of therapeutic and prevention programs, including diet therapy for lactating mothers. The aim of the work is clinical and immunological evaluating of diet therapy of lactating mothers whose children with atopic dermatitis (AD) were on the exclusive breastfeeding.

**Methods:** We observed 100 “mother and child” pairs, which were divided into two groups. All children had AD, associated to cow milk protein (CMP) allergy. Lactating mothers from both groups were treated by diet therapy with the replacement of the cow milk to the New Zealand goat milk (1st group: 43 “mother and child” pairs) or non-dairy diet (2nd group: 57 “mother and child” pairs). The effect of diet therapy was assessed by

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as we are concerned there is no similar report on identical twins and it would be useful to the geneticists as to what makes the same allergy not only manifested in both twins but also involving the same peanut molecules out of the 18 identified as being capable of binding allergen-specific IgE antibodies.

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**P93**

**P38 - Nut allergy and patterns of specific IgE components in two identical twins**

Chrys Tsakona

Dudley Group of Hospitals NHS Foundation Trust, Dudley, United Kingdom

**Clinical and Translational Allergy 2014, 4(Suppl 1)**P93

**Peanut allergy currently affects 1-2% of children in the developed countries. The role of genetics in its aetiology is unknown. For complex genetic traits, twin studies provide information on the relative contribution of genetic factors, as they decrease the relative confounding effects of the environment. The significantly higher concordance rate of peanut allergy among monozygotes suggests strongly that there is a significant genetic influence. On the other hand component-resolved diagnostics (CRD) utilize purified native or recombinant allergens to detect IgE sensitivity to individual allergen molecules and have gained growing importance. CRD allow to some extent discrimination between clinically significant and irrelevant specific IgE results and establishing of sensitisation patterns with particular prognostic outcomes.**

**Here is a case of identical male twins where the pattern of results, including that of distribution of IgE specific antibodies to individual molecules, is also identical. In the age of 4 yrs one had an ice cream with nut sprinkle and instantly developed lip swelling. They were both tested for nut and egg, as they had never had either before, were positive to both and avoided them ever since, although the other twin had once cooked egg accidentally and within few minutes developed abdominal pain and diarrhoea. They both have IgE antibodies to House Dust Mite, egg white and milk and late tree pollens. Hazelnut is the predominant nut, followed by peanut and almond and all the rest negative. In Skin Prick Testing the strongest response was to peanut with moderate responses to almond and hazelnut and the rest negative. Analysis of the IgE antibody levels against individual nut components showed a predominance of Ara8, followed by Ara2 with Ara1 and Ara8 negative. The results arranged in a graph form two lines of identical shape. As far**
dynamics of clinical and immunological AD symptoms in infants after 1-3 months of treatment. Immunological effect of the therapy was assessed by the dynamics of levels of allergen-specific IgE and IgG to CMP, casein, β-lactoglobulin and goat milk protein which were measured by uncompetitive immunoenzyme assay on special test-systems from Allergopharma (Germany). The level of IFN-γ, IL-2, IL-4, IL-5, IL-12, IL-13 was measured by immunoenzyme ELISA method.

Results: During the treatment, that included diet therapy of lactating mothers and anti-allergic therapy of infants, patients of both groups showed remission with saved breastfeeding. Immunological evaluating of therapeutic intervention’s effectiveness revealed the positive dynamics of levels of total IgE, allergen-specific IgE and IgG antibodies to CMP and its fractions, as well as to soy and goat milk protein in the blood of all children. Moreover, complex therapy conduced decreasing of proinflammatory cytokines blood level.

Conclusion: The obtained results confirmed reasonable diet treatment of lactating mothers, whose children have AD, associated with CMP allergy.

P98

P43 - Psycho-social impact of parenting children with food allergy
Aaron Cortes, Alicia Scafarri, Angela Castillo
Universidad de Chile Clinical Hospital, Santiago, Chile

Raising children with chronic diseases has been described as a stressing situation for carers. Several studies, especially in asthma and rhinitis, have documented psychological and physiologic impact on carers. However, little work describing the psychosocial impact of raising children with food allergy (FA) has been done. Consecutive carers (63) from the Universidad de Chile Clinical Hospital and from a peer support group for parents (Creciendo con Alergias) were recruited and evaluated for anxiety, depression, perceived social support and personality. Carers’ reaction due to children’s symptoms was evaluated using a scale developed by the authors. In terms of personality characteristics 40.3% of carers were anankastic, 22.6% were histrionic and 12.3% were dependant. Psychologically, 44.4% had anxiety, 15.9% had depression and 40% perceived social support as poor. Retarded allergic reaction correlated with higher carers’ irritability (r = .311, p< .05). A higher number of gastric symptoms correlated with: poorer carers’ management of crises (r = -576; p< .01); perception of being psychologically affected by child’s symptoms (r = .455; p< .01); and perception of intensification of symptoms due to family crises (r = .442; p< .01). Funny nose was associated with lower carer’s interaction with their friends (r = -.311; p< .05) and abdominal pain correlated with poor management of crises (r = .499; p< .01). Parenting children with FA is a stressing situation that affects carers’ psychological balance and social interaction. The level of symptoms also affects carers’ perception of their ability to deal with crises, which is perceived as a factor able to intensify children’s symptoms; a vicious circle that exacerbate the negative impact of raising a child with FA. A personality profile was described; however, this needs further study to be properly interpreted.

P99

P44 - Is travelling with commercial airplanes dangerous for peanut allergic children? Results of an air travel simulating provocation model
Saren Willé
Helsingborg Hospital, Helsingborg, Sweden

Peanut allergy is increasing Food allergy has a huge impact on Quality of Life for the patients and their families. Allergy is seldom reported as emergencies from Commercial Airlines but many peanut allergic patients’ reports symptoms during air flight by ingestion of peanuts but mostly by inhalation. Many peanut allergic patients avoid travelling by airplane. The risk for reaction is controversial.

From opening peanut bags and stirring in peanut bowl. No severe reaction was observed. 23 children were tested. Nine patients had a mild reaction like itching of skin, eyes or mouth or urticaria. Three patients received treatment with antihistamine and one with oral steroid. Only one had objectively observed symptoms. Air travel seems to be safe with only risk of mild symptoms in peanut allergic patient even when peanuts are served during flight.

P100

P45 - Early exclusive breastfeeding protects from preschool wheeze
George V Gubias1, Paraskes Kepapadaki1, George Moschonis1, Nikolaos Douladis1, Yannis Manios2, Nikolaos G Papadopoulos3
1Allergy Department, 2nd Pediatric Clinic, University of Athens, Athens, Greece; 2Department of Nutrition and Dietetics, Harokopio University, Athens, Greece; 3Clinical and Translational Allergy 2014, 4(Suppl 1):P100

Background: Thus far, exhaustive research has been conducted on a potential link of breastfeeding (BF) to wheezing illnesses. Nevertheless, conflicting evidence often emerges with several investigators reporting BF to protect from asthma, whereas others fail to show such a link; reports of an asthma-favoring role of BF can also be found. We therefore opted to explore the relation of different infantile feeding patterns with wheeze/asthma prevalence, in a cross-sectional, population-based study in preschool children.

Methods: Wheeze ever, doctor-diagnosed asthma and perinatal data were reported via questionnaire by parents of 1871 children aged 1-5. Information on feeding practices (exclusive breastfeeding vs mixed vs formula) and their duration (two vs four vs six months) was collected. Anthropometric measurements were conducted. Logistic regression models were build in the Statistical Package for Social Sciences (SPSS version 20.0), with the wheeze/asthma variables as main outcomes. A two-tailed p value less that 0.05, was considered statistically significant.

Results: Using the 6 months of exclusive BF as reference and following adjustment for several confounding factors (maternal prenatal smoking, maternal age at birth, gestational age, birth weight, gender, parity, passive smoking at home, parental educational level, current BMI/waist circumference and history of atopic dermatitis), we find that all regimes that did not include at least 2 months of exclusive BF were positively associated with ever wheeze (OR 1.36-2.17, 95%CI=1.355 p=0.001-0.044). Conversely, regimes including early exclusive BF of at least 2 and 4 months did not positively correlate to ever wheeze (OR 0.92-1.45, 95% CI=0.53-2.88 p=0.08-0.77); Diverse BF regimes were not differentially associated with reports of doctor-diagnosed asthma (p>0.05).

Conclusions: Early exclusive BF is associated with reduced prevalence of ever wheeze in preschoolers.

POSTER SESSION 2A: DEVELOPMENT AND CHARACTERIZATION OF WHEEZE AND ASThma

P101

P46 - Neck circumference may be related with severe asthma in children
Süleyman Tolga Yavuz1,2, Bulent Hachamdioglu2, Muratlu Arslan3
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Clinical and Translational Allergy 2014, 4(Suppl 1):P101

Background: Obesity is an established risk factor for asthma in children. Measures of central obesity are reported to be more associated with the severity of asthma in adults. The aim of the study is to investigate the association between fat distributions which is determined by anthropometric measures including neck circumference and asthma severity in children.

Method: Children with asthma who were followed in our outpatient department of pediatric allergy unit were consecutively recruited. Asthma severity was graded according to NAEPF guidelines. Patients were categorized into two groups; children with intermittent and mild persistent asthma formed Group 1 (mild asthma) whereas children with moderate...
and severe persistent asthma formed Group 2 (severe asthma). Anthropometric measures including height, weight, neck circumference (NC), waist circumference and hip circumference were obtained. Pulmonary function tests and skin prick tests were performed in all subjects.

**Results:** A total of 127 children (82 male, 46.4%) with a median age of 83 (6.4-11.3) years were included. Aeroallergen sensitization was present in 77 (60.6%) patients. 91 patients (71.6) were in the mild asthma group. There were no significant difference between two groups in terms of age, gender, aeroallergen sensitization, obesity prevalence, body mass index, waist and hip circumferences. NC of children with severe asthma were significantly wider than children with mild asthma (29.0 cm (27.0-32.0) vs. 28.0 (26.0-30.0), p=0.019). The prevalence of children with NC higher than 90th percentile were also more frequent in children with severe asthma (15 (41.7%) vs. 21 (23.1%)). Result of multivariate logistic regression analysis revealed that presence of NC > 90th percentile were associated with severe asthma (odds ratio; [95% confidence interval] (2.63 [1.10-6.28]; p=0.029).

**Conclusion:** Neck circumference, which is a simple tool of anthropometric measures, is more associated with asthma severity in children when compared with standard methods.

**Background:** Vitamin D has entered the spotlight in the search for preventive treatments against asthma and allergic disease due to its immune-modulating functions, shown in experimental models to include promotion of immune tolerance and boosting protection against infections. Vitamin D inadequacy is common, but disparate findings from cohort studies have had a polarising effect on the scientific community regarding the wisdom of advocating vitamin D supplementation for protection against asthma and allergic disorders. We have previously found that in the high-risk Western Australian CAS cohort (selected due to positive parental atopic history), the combination of multiple severe lower respiratory infections and sensitisation to inhaled allergens by age 2 profoundly increased risk of asthma development by age 5.

**Aims:** To determine whether vitamin D levels between birth and age 10 years in the CAS cohort are related to frequency of severe respiratory infections in early childhood, allergic sensitisation, and development of asthma by age 5 or 10 years.

**Methods:** We used UPLC/MS/MS (accuracy confirmed with DEQAS standards) to measure 25(OH)-vitamin D3, 3-epi-25(OH)-vitamin D3 and 25(OH)-vitamin D2 from cryobanked plasma samples collected from CAS participants at birth, then at 6 months and 1, 2, 3, 4, 5 and 10 years. CAS participants were visited by the study physician up to age 5 years for every episode of respiratory infection.

**Results:** Vitamin D3 inadequacy was common amongst cohort participants, and as expected was highest amongst participants from whom blood was collected in winter; desesasonalised vitamin D3 was calculated for longitudinal comparisons. In all assessments between 6 months (n=233) and 4 years of age (n=189) the majority of participants had inadequate vitamin D3; 51%-67% of participants had insufficient vitamin D3 (50-75 nmol/L) while 18%-28% were vitamin D3 deficient (<50 nmol/L). Analyses addressing the aims are underway and will be presented at the Meeting.

**Background:** Obesity can be considered as a chronic inflammatory process, which is associated with many different diseases like asthma, and it induces the production of Leptin which worse disease severity.

**Objective:** Our objective was to evaluate the levels of serum Leptin and its effect on Th1 / Th2 imbalance in obese and non-obese children with asthma, and to investigate the association between these levels and clinical outcome.

**Patients and method:** 50 atopic asthmatic children; (25 obese and 25 non obese), and 20 controls were involved in the study. Asthmatic children were with different clinical disease stages according to GINA. BMI was determined and peripheral blood samples were taken to determine IFNγ, IL-4, and Leptin concentrations. Disease severity was assessed by asthma symptom score and its relation to other parameters was determined.

**Results:** Serum Leptin levels were elevated in obese and non obese asthmatic children in comparison to controls with marked elevation in obese asthmatics. IFNγ was significantly elevated and IL-4 was significantly reduced in obese asthmatic group. Obese asthmatic children have higher asthma symptom score and significant lower FEV1% in comparison to non obese asthmatics. Only in obese asthmatic children, there was significant positive correlation between serum Leptin and IFNγ levels. There was significant positive correlation between Leptin and asthma symptom score in obese and non obese asthmatic children.

**Conclusion:** Leptin is involved in the pathogenesis of asthma in obese and non obese children but its effect is prominent in obese asthmatics. In the presence of high Leptin, only obese asthmatic children exhibited Th1polarization with greater amount of INF γ and more severe asthma state.

**Background:** Obesity is a chronic inflammatory disease with a variety of health challenges. The association between obesity and asthma is well established. Vitamin D3 is a hormone that can be obtained from healthy skeleton or produced endogenously by skin under sunlight. Deficiency of vitamin D3 affects the immune system and increases the risk of developing respiratory infections.

**Objective:** The purpose of this study is to determine whether vitamin D levels between birth and age 10 years were related to frequency of respiratory infections and its effect on Th1/Th2 ratio and Leptin levels between birth and age 10 years.

**Methods:** We used UPLC/MS/MS (accuracy confirmed with DEQAS standards) to measure 25(OH)-vitamin D3, 3-epi-25(OH)-vitamin D3 and 25(OH)-vitamin D2 from cryobanked plasma samples collected from CAS participants at birth, then at 6 months and 1, 2, 3, 4, 5 and 10 years. CAS participants were visited by the study physician up to age 5 years for every episode of respiratory infection.

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**Patients and method:** 50 atopic asthmatic children; (25 obese and 25 non obese), and 20 controls were involved in the study. Asthmatic children were with different clinical disease stages according to GINA. BMI was determined and peripheral blood samples were taken to determine IFNγ, IL-4, and Leptin concentrations. Disease severity was assessed by asthma symptom score and its relation to other parameters was determined.

**Results:** Serum Leptin levels were elevated in obese and non obese asthmatic children in comparison to controls with marked elevation in obese asthmatics. IFNγ was significantly elevated and IL-4 was significantly reduced in obese asthmatic group. Obese asthmatic children have higher asthma symptom score and significant lower FEV1% in comparison to non obese asthmatics. Only in obese asthmatic children, there was significant positive correlation between serum Leptin and IFNγ levels. There was significant positive correlation between Leptin and asthma symptom score in obese and non obese asthmatic children.

**Conclusion:** Leptin is involved in the pathogenesis of asthma in obese and non obese children but its effect is prominent in obese asthmatics. In the presence of high Leptin, only obese asthmatic children exhibited Th1polarization with greater amount of INF γ and more severe asthma state.

**Background:** Obesity is a chronic inflammatory disease with a variety of health challenges. The association between obesity and asthma is well established. Vitamin D3 is a hormone that can be obtained from healthy skeleton or produced endogenously by skin under sunlight. Deficiency of vitamin D3 affects the immune system and increases the risk of developing respiratory infections.

**Objective:** The purpose of this study is to determine whether vitamin D levels between birth and age 10 years were related to frequency of respiratory infections and its effect on Th1/Th2 ratio and Leptin levels between birth and age 10 years.

**Methods:** We used UPLC/MS/MS (accuracy confirmed with DEQAS standards) to measure 25(OH)-vitamin D3, 3-epi-25(OH)-vitamin D3 and 25(OH)-vitamin D2 from cryobanked plasma samples collected from CAS participants at birth, then at 6 months and 1, 2, 3, 4, 5 and 10 years. CAS participants were visited by the study physician up to age 5 years for every episode of respiratory infection.

**Results:** Vitamin D3 inadequacy was common amongst cohort participants, and as expected was highest amongst participants from whom blood was collected in winter; desesasonalised vitamin D3 was calculated for longitudinal comparisons. In all assessments between 6 months (n=233) and 4 years of age (n=189) the majority of participants had inadequate vitamin D3; 51%-67% of participants had insufficient vitamin D3 (50-75 nmol/L) while 18%-28% were vitamin D3 deficient (<50 nmol/L). Analyses addressing the aims are underway and will be presented at the Meeting.
Introduction: Mother's smoking during pregnancy has negative consequences in fetus respiratory system's development and asthma's manifestation later in children's life as well.

Material: Recording the influence of mother's smoking during pregnancy to the frequency of asthma's manifestation in children.

Methods: The study was performed at Pediatric Emergency Room and concerns the last two years (statistical analysis was done using the statistical package IBM SPSS Statistics v19).

Results: Presented in the following table.

Table 1 (abstract P108)

<table>
<thead>
<tr>
<th>Smoking</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>210 (90.1%)</td>
<td>23 (9.9%)</td>
<td>233 (100%)</td>
</tr>
<tr>
<td>Yes</td>
<td>25 (67.6%)</td>
<td>12 (32.4%)</td>
<td>37 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>235 (87%)</td>
<td>35 (13%)</td>
<td>270 (100%)</td>
</tr>
</tbody>
</table>

Acknowledgement: The investigation is supported by the Russian President grant MD № 4241.2012.7.

Conclusions: Smoking during pregnancy is asthma's predisposing factor at all ages. Mothers who smoked during pregnancy were three times more likely to acquire children suffering from asthma than those who did not smoke.

P109

PS4 - Sex differences in the relation between BMI changes and the prevalence and severity of wheezing and asthma in the first year of life
Gustavo Wandalsen1, Leila Borges1, Nathalia Barrosi1, Fabiola Suan1, Javier Mallo2, Dirceu Sole2, Brazil EISL Group1
1 Federal University of São Paulo, São Paulo, Brazil; 2USACH, Santiago, Chile Clinical and Translational Allergy 2014, 4(Suppl 1)P109

Background: Rapid weight gain has been recently associated with asthma at school age, but its influence in respiratory symptoms during infancy is still unknown.

Objective: To evaluate associations between changes in body mass index (BMI) with the prevalence and severity of wheezing and asthma in the first year of life.

Methods: Answers to the International Study of Wheezing in Infants (EISL) questionnaire from 6541 parents living in six different cities of Brazil were analyzed. Data from reported weight and height at birth and at one year were used to calculate BMI (z scores). Rapid BMIz gain was defined by the difference superior to +1.0 and excessive by the difference superior to +2.0.

Results: Rapid BMIz gain was found in 45.8% infants and excessive BMI gain in 24.4%. Boys showed a significantly higher BMIz gain than girls. Girls with rapid BMIz gain showed a significantly higher prevalence of hospitalization for wheezing (8.8% vs 6.4%; aOR: 1.4, 95%CI: 1.1 to 1.8), severe wheezing (18.1% vs 15.0%; aOR: 1.3, 95%CI: 1.0 to 1.5) and medical diagnosis of asthma (7.5% vs 5.7%; aOR: 1.3, 95%CI: 1.0 to 1.7). Girls with excessive BMIz gain also had a significantly higher prevalence of hospitalization for wheezing (9.8% vs 6.7%; aOR: 1.5, 95%CI: 1.1 to 2.0) and severe wheezing (18.9% vs 15.5%; aOR: 1.3, 95%CI: 1.0 to 1.6). No significant association was found among boys. Breastfeeding was significantly less frequent among infants with rapid and excessive BMIz gain.

Conclusions: The majority of the evaluated infants showed BMIz gain above expected in the first year of life. Although more commonly found in boys, rapid and excessive BMIz gain in the first year of life were significantly associated with more severe patterns of wheezing in infancy only among girls.

P110

P55 - Air-pollution and respiratory symptoms in children
Zorica Zivkovic1, Svetlana Cevarević1, Vesna Ivanjević1, Ivana Filipović1, Vesna Jevtić1, Ljubica Marić2
1MC “Dr. Dragiša Mitrović “Children’s Hospital for Pulmonary Diseases and Tuberculosis, Belgrade, Serbia; 2Health Center Budva, Budva, Serbia
Clinical and Translational Allergy 2014, 4(Suppl 1)P110

Introduction: Studies of school environment and related health diseases in pediatric population have been performed recently. The European Commission, through the Directorate General for Health and Consumer Affairs, funded the study on Health Effects of School Environment held in different European countries. Levels of air pollutants can be several folds higher exposures are prolonged. Since children spend a large part of the day in school environment, nationwide initiatives to evaluate such indoor air quality (IAQ) were developed.

Material and methods: The study protocol includes: one standardized questionnaire on school characteristics and IAQ policy completed by teachers, two standardized questionnaire derived from the International Study of Asthma and Allergy in Childhood questionnaire on characteristics of children one filled in by the pupils and the other by their parents, school environment assessments and no invasive clinical tests.

Results: Previous studies revealed that pupils exposed to an elevated level of indoor PM10 and CO2 showed higher prevalence of all respiratory disorders than those exposed to lower level, significantly so.
for dry cough and as regards CO2, also for rhinitis. The prevalence of dry cough significantly (p<0.001) decreased with decreasing mean indoor levels of PM10 and CO2.

P111

P56 - Control of allergic inflammation and erythrocytes magnesium level in children with bronchial asthma
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Clinical and Translational Allergy 2014, 4(Suppl 1)pP111

Purpose: To examine the relationship of severity and duration of allergic inflammation to the erythrocytes magnesium level in children with bronchial asthma (BA).

Materials and methods: 40 patients with a diagnosis of mild to moderate severity were divided into 2 groups: Group 1 included 20 patients experienced disease less than 5 years; Group 2 included 20 patients with disease duration of more than 5 years. All patients received standard treatment of inhaled corticosteroids. Patients were to determine the level of NO in exhaled air using a device NObreath and the concentration of markers - sICAM-1, IL-4, IL-8, IFN-gamma, and magnesium content in erythrocytes. To assess the level of asthma control used ACT test.

Results: Patients comparison groups had comparable levels of clinical control of asthma by AST-Test. In determining the level of nitric oxide in exhaled air were obtained pre-credibility of the differences between the groups. A more pronounced level of allergic inflammation in patients 2 groups confirmed higher concentrations of its laboratory markers, in determining the level of magnesium in red blood cells have lower it with the content of the group 2 patients.

Conclusions: The study revealed the discrepancy between clinical asthma control level and laboratory markers of allergic inflammation. In patients with longer experience of the disease on a background of basic therapy revealed higher levels of allergic inflammation and lower levels of magnesium in erythrocytes. Pharmacological correction of magnesium levels may be useful to improve the efficiency of basic therapy of asthma and achieve control of allergic inflammation.

P112

P57 - Prognostic factors for asthma at school age in infants with atopic dermatitis
Sophia Tsabouri1, Manthoula Valari, Konstantinos Douros2, Vasiliki Gemou-Engesaeth, Maria-Alexandra Magiakou1, Evangelia Papadavid, Maria Theodoridou1, Konstantinos Priftis3
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Clinical and Translational Allergy 2014, 4(Suppl 1)pP112

Introduction: The prevalence of atopic dermatitis (AD), one of the most common skin disorders seen in infants and children, is increasing, similar to that of other atopic disorders, particularly asthma. Although children showing more severe dermatitis have a higher risk of having more persistent AD, the role of severity as prognostic determinants for childhood asthma is not clearly determined.

Aim: To determine clinical and laboratory prognostic factors in infants with AD for subsequent development of asthma at school age.

Materials and methods: 89 infants with AD aged 3 to 24 months were recruited and followed up until the age of 8 years. The severity of AD at the time of the initial visit was calculated by using the SCORAD index, whereas the laboratory parameters determined were: peripheral blood eosinophil count, serum ECP, total IgE and specific IgE levels for a panel of food and inhaled allergens. Every second year, parents were interviewed about symptoms and diagnosis relevant to asthma by using a standardized questionnaire. At the end-visit, specific IgE for the same panel of food and inhaled allergens were measured and, pre- and post-bronchodilator spirometry was performed.

Statistical analysis: For the purpose of univariate, descriptive analysis Fisher's exact tests were used and for the multivariate analysis of data logistic regression models.

Results: The study population the age of 8 consisted of 72 children. They had significantly increased the risk of asthma at school age when sensitized to inhaled allergens in infancy (p<0.001). Asthma development was significantly related with ECP levels (p=0.019, OR: 1.10, CI: 1.01 – 1.20). None of the other analyzed early life factors (ie, severity, sex, presence of other atopic conditions, and family history of atopi) showed any association with subsequent development of asthma.

Conclusion: AD severity in infancy does not have any effect on the future development of asthma. Prognostic determinants were found to be allergic sensitisation to inhaled allergens, as expected, and ECP levels, probably, as allergic eosinophilic inflammation indicator.

P113

P58 - The role of osteopontin and vitamin D in school-age asthmatic children for predicting asthma exacerbation
Pinar Uysal1*, Meral Karaman1, Ozkan Karaman1, Zeynep Tuba Ankar Ayyildiz2, Nevin Uzuner1
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Clinical and Translational Allergy 2014, 4(Suppl 1)pP113

Background: Vitamin D plays an essential role in asthma by cell proliferation, differentiation and immunomodulation, and Osteopontin (OPN) is also associated with airway remodeling and fibrosis. Previously, it was shown that active Vitamin D and Vitamin D receptor cooperate in the transcriptional regulation of OPN expression.

Objective: We aimed to evaluate the role of serum OPN and its association with 25-OH Vitamin D [25(OH)D] levels in asthmatic children and to investigate the possible role of associations during non-exacerbation and exacerbation periods and to compare the results with controls.

Methods: In prospective, cross-sectional designed study, moderate-severe 85 asthmatic children and 60 healthy children were recruited. The severity of asthma was evaluated according to the GINA guideline. The 25(OH)D levels and OPN levels of asthmatics were investigated in non-exacerbation period, exacerbation period and compared with controls.

Results: OPN levels (ng/ml) were significantly higher in asthmatics in non-exacerbation period when compared to non-exacerbation period, and controls [30,61±3,21 vs. 28,7±3,71 vs. 27,62±3,91, respectively; p<0,001]. There was no significant difference among OPN levels between asthmatics and controls, [p=0,094]. 25(OH)D levels (ng/ml) were significantly lower in asthmatics in exacerbation period when compared to non-exacerbation period, and controls [30,15±5,11 vs. 32,23±5,80 vs. 34,16±5,86, respectively; p<0,001]. There was no significant difference among 25(OH)D levels between asthmatics and controls, [p=0,051]. There was a correlation for both OPN and 25(OH)D levels among asthmatics in exacerbation period and non-exacerbation period, respectively (r=0,40, p<0,001 and r=0,62, respectively). But, no correlation between OPN and 25(OH)D levels among asthmatics in exacerbation and non-exacerbation periods (r=0,78, p=0,481; r=0,10, p=0,448, respectively).

Conclusion: OPN might play a role in childhood asthma and can be a useful marker for prediction of exacerbation. There was no correlation between OPN and 25(OH)D levels in asthmatic children. We suggest some other factors might have a role in OPN secretion besides vitamin D.

P114

P59 - Kartagener syndrome in infant – case report
Tanya Hristeva1, Simra Mileva, Milena Vankova, Ivanaka Galeva, Todor Todorov
Pediatric Department, Alexandrovska Hospital, Medical University Sofia, Sofia, Bulgaria
Clinical and Translational Allergy 2014, 4(Suppl 1)pP114

Kartagener syndrome (situs inversus, sinusitis and bronchiectasis) is a rare, ciliopathy, autosomal recessive disorder that causes a defect in the action
of the cilia lining the respiratory tract. Situs inversus can be seen in about 50% of cases. We present a case of a 10-months-old girl with total situs inversus, diagnosed at birth and recurrent respiratory tract infections. The child was with repeated admissions since 5 months age. The suspicion for Kartagener’s syndrome was made based on clinical presentation and radioimaging. Nasal brushing as least invasive enables observation of ciliary structures in electron microscopy. The results revealed an anomaly in the organization of the ciliary microtubules. An early diagnosis and treatment may prevent the development of bronchiectasis, which define the prognosis.

**Poster Session 2B: Asthma, Presentation, Monitoring and Management**

**P116**

**P61 - Atypical presentation of childhood asthma**

Selda Ali1, Ilena Maria Ghiondanescu2, Roxana Silvia Bumbacea3

1Regina Maria Clinic, Constanta, Romania; 2Dias Emergency University Hospital, Bucharest, Romania; 3Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

Clinical and Translational Allergy 2014, 4(Suppl 1):P116

**Background:** Food allergy and asthma coexist in many children, although it remains unclear whether or not food allergy and asthma are simply associated to each other due to the underlying predisposition to atopic diseases or whether they are actually causally related.

**Case description:** We present the case of a seven years old boy with recurrent episodes of anaphylaxis (4 in one year). Each episode occurred after ingestion of foods containing peanuts and consisted of generalized urticaria and wheezing. 6 months after the last episode he developed persistent asthma symptoms (shortness of breath, cough and wheezing) first time, while running in the park. He was diagnosed with asthma, according to PRACTALL consensus report.

We performed a complete allergological evaluation. The total IgE was elevated. Skin prick tests to main food and aeroallergens were negative, except for peanut where he developed a wheal of 4/5 mm diameter. We measured the specific serum IgE for most common food allergens, peanut was significantly high. Evaluation of lung function revealed that FEV1 was decreased by 27%.

We recommended avoidance measures of all foods containing peanuts. He received treatment with montelukast sodium 5 mg daily and fluticasone propionate 250 mcg daily, and salbutamol as reliever medication and in case of exacerbation or before a physical activity. He did not have any other episode of anaphylaxis, but we could not step down the inhaled corticosteroid. We also prescribed him epinephrine autoinjector.

**Discussion:** Children with both food allergy and asthma are at increased risk for severe asthma, particularly if the asthma is uncontrolled. We present the case of an atypical debut of asthma in a child with IgE mediated food allergy. During follow up the evolution of asthma was independent of avoidance measures of the culprit food. The patient might be a candidate for anti-IgE treatment.

**Results:** Chichak (hemidactylus frenatus). In tropical countries, chichak droppings accumulate behind furniture, pictures, and along walls. The faeces may contain salmonella27 and crypto-sporidiosis. Over time fungi growing on it liberate spores into the air causing allergies and asthma exacerbation. Frankincense and myrrh. Arabian incense burning is a known common asthma trigger among asthmatic Omani children. A report in the Bethlehem Journal of Medicine reveals that can cause ailments including asthma. Durian. This fruit known to "taste like heaven but smells like hell" is revolting and may cause anaphylaxis, but has not been proven to cause asthma. Ascariis. A large study on the interrelationships between asthma, atopy and helminthic infection in children from asthmatic families in rural China has shown that Ascaris is closely associated with increased risk of childhood asthma, increased airway responsiveness to methacholine and was independent of sensitization to common aeroallergens. Spices. With globalization, curry is popular internationally. Capsaicin causes bronchoconstriction. As authentic curries are not tolerated by all, restaurateurs add tatzarine, a well-known trigger for asthma.

**Conclusion:** There is adequate objective evidence to label chichak, frankincense, ascaris and spices, but not durian as asthma triggers. Preventive measures can reduce acute asthmatic attacks in sensitive individuals.

**P117**

**P66 - Immunogenicity of 13-valent conjugate pneumococcal vaccine (PCV13) in children with asthma or recurrent wheeze receiving inhaled corticosteroids (ICS)**

Leiki Giannopoulou1, Polytimi Panaghiotopoulou-Gartagan2, Eleni Kyrtis3, Athanasios Kaditis1, Maria Theodoridou1, Vasiliki Spoulou1

1Pediatrics Department, Tzanioe General Hospital, Piraeus, Greece; 2Pediatric Pulmonology Unit, 1st Department of Pediatrics, National Kapodistrian University of Athens School of Medicine, "Agia Sofia" Children’s Hospital, Athens, Greece; 3Technological Institution of Athens, 1st Nursing Department, Athens, Greece; 41st Department of Pediatrics, National and Kapodistrian University of Athens School of Medicine, "Agia Sofia" Children’s Hospital, Athens, Greece

Clinical and Translational Allergy 2014, 4(Suppl 1):P117

**Introduction:** Malaysia, a multi-racial country embraces different religious practices and customs. In this bazaar, we identified some unique asthma triggers that need sharing with other doctors. Awareness of these triggers can lead to better prevention and management.

**Objectives:** This study reviews the evidence incriminating chichak, frankincense and myrrh, durian, ascaris, and spices as asthma triggers.

**Methods:** A search was carried on these agents’ relationship to asthma using Google Scholar.
Introduction: Patients with asthma have been reported to be at increased risk of invasive pneumococcal disease (IPD). Therefore, routine vaccination against Streptococcus Pneumoniae is suggested for all children suffering from asthma or recurrent wheeze. Inhaled corticosteroids (ICS) are the preferred treatment for initiating long-term control therapy in these children. Their effect on the immunogenicity of PCV13 is yet unknown.

Aim: To evaluate the immunogenicity of PCV13, in children with asthma or recurrent wheeze, receiving medium doses of ICS for extended periods of time.

Method: 40 children (26 boys) with asthma or recurrent wheeze (mean age 4.3 ± 1.05 years) were assigned to 3 groups according to the duration of their ICS therapy (1st 30days, 2nd 30-90 days, 3rd >90 days, dosage 200-250μg/day of inhaled fluticasone in all groups). 13 healthy age-matched children were included in the study as controls (group 0).

All children received for the first time one dose of PCV13. Pneumococcal serotype (PS) specific IgG antibodies to serotypes 3 and 19A were measured by ELISA, before and 31.9 ± 5.6 days after vaccination. IgG concentration ≥ 0.35μg/ml was considered protective for invasive disease. For the statistical analysis SPSS17 and non-parametric tests were used. The statistical significance level was set at p<0.05.

Results: One month after vaccination, 96.2% of all 53 children had protective IgG concentration ≥ 0.35μg/ml, for each serotype. The geometric mean concentration (GMC) of IgG antibodies after vaccination, the increase in the GMC and the percentage of children that achieved protective IgG concentration ≥ 0.35μg/ml did not differ for neither of the serotypes, when compared among our 4 groups (p > 0.05).

Conclusion: The immunogenicity of PCV13, in children with asthma or recurrent wheeze, is not affected by the use of medium doses of ICS as control therapy, even after extended periods of time.

P124
P69 - Development and evaluation of CARATkids, Control of Allergic Rhinitis and Asthma Test for children
Daniela Linhares*, Almeida João Fonseca, Miguel Luis Borrego, Mário Morais-Almeida, CARATKids Study Group
CINTESIS, Faculty of Medicine, University of Porto, Porto, Portugal
Clinical and Translational Allergy 2014, 4(Suppl 1):P124

Background: CARAT is the first tool available to concurrently assess the control of rhinitis and asthma in adults. No similar questionnaire was, so far, available for children.

Aim: To develop and evaluate the measurement properties of CARATKids, a questionnaire designed to assess the control of allergic rhinitis and asthma (ARA) in children with 6-12 years old with a previous medical diagnosis of ARA.

Methods: Development: 1) A literature review for pediatric questionnaires on asthma and/or rhinitis control was performed;
2) A multidisciplinary working group held consensus meetings to develop CARATKids preliminary version;
3) A cognitive test was done in a cross-sectional, qualitative study, with face-to-face interviews of 29 children and their caregivers.

Evaluation: Prospective multicenter validation study. In a 2 visits program scheduled 3-5 weeks apart, questionnaires (including cACT) and VAS were filled by children with ARA and their caregivers. Physicians blinded for questionnaire results assessed children’s ARA status. Logistic regression and reliability analysis were used to select the questions to be included in CARATKids final version; and discriminative properties, reliability and validity were evaluated.

Results: Development: A 17-item preliminary version with dichotomous (Yes/No) answer format accompanied by illustrative drawings was produced.

Evaluation: 113 children (44 female) and their caregivers were included in 11 centers. Children’s mean(sd) age was 8.8(1.9) years old, 48 had their asthma controlled and 37 had moderate/severe rhinitis. After item reduction, the final questionnaire has 13 questions (8 to be answered by the child, and 5 by the caregivers). The internal reliability was 0.8; the correlations coefficients with external measures of control were higher than a priori predictions ranging between 0.516 (with physician assessment of rhinitis control) and 0.697 (with cACT).

Conclusion: CARATKids, the first questionnaire to assess allergic rhinitis and asthma control in children, was developed and has adequate internal consistency, concurrent and clinical validity.

P125
P70 - Testing adherence to asthma clinical guidelines in Spain
Letícia González-Martín, Fernando Centeno-Mañá, Roberto Velasco-Zúñiga, Juan Enrique Trujillo Wurttele, José Luis Fernández Ambas, Sara Puente-Montes, María Nathalie Campo-Fernández, Sara Martín-Armenta, Rebeca Mozun-Rico, Elena Pérez-Gutierrez
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Clinical and Translational Allergy 2014, 4(Suppl 1):P125

Objectives: To grade clinical practice variation within pediatricians of the north region of Spain society (SCCALP), and the adherence to current evidenced-based clinical guidelines.

To test significant differences depending on the grade of experience and work environment.

Materials and methods: An anonymous survey was emailed to the pediatrician members of SCCALP using the online platform provided by Google Drive. The test consisted in multiple clinical scenarios, and multiple answers were available.

Results: A total of ninety-nine surveys were submitted. Distribution of the pediatricians who answered was as follow: 15% ER, 14% impatient ward, 10% subspecialties, 6% neonatology, 41% general pediatrics, and 13% pediatric residents.

On a clinical scenario of an asthma exacerbation, 71.8% pediatricians correctly identified the severity of the exacerbation as moderate using the pulmonary score, and 86.2% would start an oral glucocorticosteroids treatment plus inhaled rapid-acting b2 agonists at adequate doses. Moreover, up to 48.9% would start a controller treatment. However, only 89.2% of them would use an adequate inhaled glucocorticosteroids dose and for an adequate period of time.

There were no significant differences in the population surveyed answers, although their experience and working environment were not homogeneous.

Conclusions: Severity scores are not widespread in our region, although this fact does not affect the assessment and correct treatment of exacerbations.

There is a positive trend towards starting a controller treatment from the ER consultation.

The adherence to the current asthma evidence-based clinical guidelines is insufficient.

It is important to perform periodical revisions of the adherence to the guidelines in order to detect our flaws and to improve our clinical performance.

P126
P71 - Shared care and implementation of pediatric clinical pathway
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Clinical and Translational Allergy 2014, 4(Suppl 1):P126

Background: Asthma is the most common chronic disease among Danish children and the aim of the treatment should be total control and no symptoms. Successful asthma management involves guideline-based treatment and regular follow-up. The international guidelines from “Global Initiative for Asthma” (GINA) are implemented as a clinical pathway and can improve intersectional collaboration on children with asthma, which is based on a shared responsibility of the treatment between general practitioners and pediatricians called Shared Care.

Aim: 1. The well-controlled asthmatic children have to be followed in general practice and asthmatic children without control have to be followed at the pediatrics department with defined intervals (based on evaluation of symptoms, lung function, treatment and compliance.)
2. The proportion of children with well-controlled asthma will increase.
3. We wish to show favorable changes in the use of asthma medication.
4. Children with asthma will get a higher quality of life.

Methods: Follow-up study from 1st of April 2011 to 31th of April 2014, with the inclusion of asthmatic children with a validated diagnosis aged 0-15 years followed at the out-patient clinic at the pediatrics department at a regional hospital and by 100 GPs in the area. The total number of patients in the area is estimated to 3000.
Intervention: Implementation of a clinical pathway and treatment guide. Data is obtained from GP's and the outpatient clinic, a regional prescription database and through questionnaires in the form of Paediatric Asthma Quality of Life Questionnaire (PAQLQ (S)), PACQLQ and The Childhood Asthma Control Test (C-ACCT).

PERSPECTIVES: The project will hopefully provide significant documentation, which can be used nationally for the recommendations of the future organization of childhood asthma diagnosis, treatment and control.

P128
P73 - Speak Up For Asthma (SUFA) Program for schoolchildren in London – a pilot study
Jonny Coppell1, Lucy Gibson2, Rahul Chodhar2
1University College London Medical School, London, United Kingdom; 2Royal Free London NHS Foundation Trust, London, United Kingdom

Introduction: There are three children with asthma in every classroom in English secondary schools. Asthma UK charity predicts that more than 75% of hospital visits are preventable by better recognition of symptoms and early management. Hence, education and empowerment of children is a valuable key in reducing hospital visits.

Method: A paediatric Consultant trained five senior medical students in conjunction with their Speak Up For Asthma (SUFA) programme. The medical students delivered an interactive presentation to schoolchildren aged 7-14 years. The effectiveness of the programme was measured by comparing results of an asthma awareness test before and after interactive presentation.

Results: Asthma awareness test had 11 questions with combination of true/false and descriptive statements.
1. The mean score increased from 55% to 93% after the teaching across all ages (p<0.01).
2. Girls pre-course scores were lower than boys but improved to a similar level of >90% after teaching.
3. Nine and ten year olds showed highest improvement in scores in comparison to other age groups.
4. The greatest increases were seen in the questions concerning the use of inhalers, asthma attack triggers and correct asthma attack response.
5. Teachers and school nurses gave positive feedback on asthma update.

Discussion: Results are encouraging from many viewpoints.
1. SUFA programme represents a cost effective, low investment opportunity to engage curiosity of schoolchildren.
2. Although, in the short-term there was significant improvement in the asthma knowledge of schoolchildren, it would be crucial to establish long-term efficacy of the programme by administering similar test at three and six months.
3. Our results suggest that in its current format the programme confers the most benefit to children aged nine to ten. Alternative ways to engage wider age groups should be studied.

P129
P74 - Brittle asthma: a clinical phenotype of severe asthma
Maria Zoto1, Albana Deliu, Eldida Nikoli2, Mehmet Hoxha, Alfred Prittani
1University Hospital Centre, Tirana, Albania

Background: The term Brittle Asthma was generally used to describe those patients with sudden, severe attacks, usually out of the blue. Recently the following classification was suggested: type 1 characterized by a maintained wide PEF variability despite medical therapy, and type 2 characterized by sudden acute attacks on a background of apparently normal airway function. Patients who develop sudden-onset near-fatal asthma seem to have massive allergen exposure and emotional distress. Diminished perception of dyspnea and reduced compliance with anti-inflammatory therapy have been associated with fatal or near-fatal events.

Case: We are presenting two case reports of two patients admitted to emergency service due to severe asthma attacks. The first, 31 year-old patient with clinical history: allergic rhinoconjunctivitis since the age of 16 and untreated atopic asthma since the age of 20.

At the moment of hospitalization he was without conscience, with tachypnea, cyanosis and the following vital signs: temperature 37.4°C, blood pressure 90/60 mmHg, pulse rate 140 bpm. The second, 40 year-old patient, was admitted with cyanosis, breathless and agitated with the following vital signs: temperature 37°C, blood pressure 70/40 mmHg, pulse rate 130 bpm. ABG yielded the following: pH 7.41, BE 8.4. His clinical history was: allergic asthma and rhinoconjunctivitis since the childhood, reappearance of asthma at the age of 22, and frequent avoidance of steroid therapy.

At the thoracic examination diffuse inspiratory and expiratory wheezes with prolonged expiratory phase were present. Chest radiography and EKG were normal. Laboratory: blood count, renal, liver functions were normal. They were successfully resuscitated and recovered completely after aggressive treatment.

Conclusions: We considered our patients as type 2 brittle asthma. Poor adherence with steroid treatment, ignoring the symptoms of airways obstruction, and emotional distress are offending factors for these near fatal attacks. Patients with brittle asthma are difficult to manage. They have to be monitored firmly and treat the acute attacks with self-administered subcutaneous adrenaline.

P130
P75 - The role of the pediatric research nurse in ensuring successful recruitment and retention of research participants for the UBIOPRED pediatric asthma study
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Introduction: The UBIOPRED study (Unbiased BIOmarkers for the Prediction of Respiratory Diseases) is a longitudinal asthma research study. It will identify phenotype/omic handprints to improve our understanding of severe asthma and identify potential targets for new pharmacotherapies.

The aim of this poster is to illustrate how the research team successfully recruited and retained the Southampton portion of the paediatric UBIOPRED cohort using an acronymic approach.

Methods: A simple acronym was developed by the NIHR Southampton Wellcome Trust Clinical Research Facility (WT CRF) nurses to enable successful recruitment and retention of participants:
• Approach – Participants were usually approached during their outpatients’ appointment. This ensured neutral ground, so the study could be discussed with their consultant.
• Belief – The research nurses believed in UBIOPRED, which instilled confidence when discussing the study with potential recruits.
• Commitment – Retention was only possible through the commitment of participants and nurses. Study visits were coincided with clinic appointments whenever possible to reduce inconvenience.
• Dedication – The research nurses went to great lengths to ensure the participants’ needs were met.
• Experience – The participants’ research experience needed to be positive to ensure retention. Participants were supported if they had anxieties and were never pressed to undertake research procedures.
• Fun – Age appropriate fun was key to each study appointment.

Results: The final recruitment figures for the UBIOPRED paediatric cohort at Southampton exceeded the target set (figure 1). At present, all participants have returned for longitudinal visits within the expected time frame (figure 2). The feedback from the parents and participants has demonstrated that the research has impacted positively on their lives often resulting in better education of their asthma and improved disease control.

Conclusions: Using an ABCDEF approach, the children’s asthma and allergy research nurses have exceeded their recruitment target and successfully followed up participants on the UBIOPRED study.
**POSTER SESSION 2C: ASTHMA TREATMENT**

**P131**

**P76 - Can we successfully collect research data from children with asthma using a SMS system?**

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**Introduction:** A meaningful analysis in research is only possible with robust, valid data. Paper diaries allow the collection of data from individuals over time but are notorious for poor compliance and reliability. SMS technology is a novel method for data collection in medical research. Time-tagged SMS can be transferred directly to an electronic data file.

**Methods:** We used SMS to collect symptoms and peak flow (PEF) meter readings from children with asthma. Digital PEF meters enabled data download to confirm validity of PEF data sent by SMS. Parents responded to 5 SMS messages daily for 7 days during baseline and for 14 days during a cold. Parents provided written feedback about the SMS-based data collection at the beginning (Q1) and at the end (Q2) of the study.

**Results:** 92% (22/24) and 83% (20/24) of participants completed Q1 and Q2 respectively. All (22/22) were ‘very happy’ or ‘happy’ to use SMS for this study. 95% (19/20) found the system user-friendly and 55% (11/20) said that they would more likely participate in a study using SMS for data collection. 25% felt ‘sometimes’ unhappy about receiving the SMS with ‘lack of time’ as one problem mentioned. In 3.1% (0, 6.5) SMS remained unanswered, in 6.4% (2.4, 13.7) PEF data sent were not recorded on the meter, in 16.9% (11.5, 23.2) PEF readings sent via SMS did not correlate with the readings stored on the meter. (Numbers represent % Median (25th, 75th percentile)).
Discussion: This real-time capture of data appears to be well accepted and could avoid some of the pitfalls of backfilled paper diaries although the reliability of data needs further scrutiny.

P134  P79 - AsthmaVent – effect of mechanical ventilation on asthma control in house dust mite allergic children with asthma
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Clinical and Translational Allergy 2014, 4(Suppl 1) P134

Background: House dust mite allergy is a frequent cause of asthma in children. Children with house dust mite allergy and asthma are especially sensitive to physical and chemical agents in the indoor air and as children spend a lot of time indoors, it seems reasonable to believe that improving the indoor environment will lead to an improvement in asthma disease. At present, there is no clear consensus on the effect of ventilation on asthmatic children with house dust mite allergy. Earlier studies have been criticized for being small, poorly carried out and inconclusive. Thus there is a need for a powerful and methodologically rigorous study to provide significant evidence as a basis for the future treatment of children with house dust mite allergy and asthma.

Objective: This study started in the fall 2012 and aims at investigating whether mechanical ventilation is able to improve asthma symptoms during the winter season for children with house dust mite allergy and asthma.

Materials and methods: The study is a randomized double-blind placebo-controlled intervention study, with 9 months of intervention and follow-up. 80 children are included from 3 Danish hospitals and are randomized into two groups. The intervention is mechanical ventilation in the child’s bedroom. We monitor indoor air quality and health outcomes every three months. Primary outcomes are minimal effective dose of inhalation steroids and reduction in levels of particulate matter and house dust mite allergen.

Perspectives: Asthma patients and their families rely on good evidence-based advice on behavior and design of housing, so that the specific and non-specific factors in the indoor environment that trigger the disease are controlled as well as possible. The results of this project will be a significant contribution to the recommendations that can be given in relation to the effect of ventilation on indoor air quality in the asthma control of house dust mite allergic children.

P135  P80 - An evaluation of the efficacy and safety of a dust mite sublingual immunotherapy in allergic asthmatic children: a retrospective clinical data analysis over a three-year period
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Clinical and Translational Allergy 2014, 4(Suppl 1) P135

Background: A promising treatment for allergic asthma (AA) in children is the sublingual specific immunotherapy (SLIT) which targets mild or moderate persistent AA types. There have not been any studies to investigate the efficacy and safety of adding SLIT to combination therapy (budesonide / formoterol) in asthmatic children sensitive to house dust mite (HDM).

Aims and objectives: The aims of this current study were to evaluate the effectiveness and safety of adding SLIT to combination therapy (budesonide / formoterol) in HDM sensitive children with AA over a three-year period. Another aim of this study was to evaluate the possibility of reducing the dose of the combination therapy on using SLIT.

Methods: This study has followed a retrospective clinical and laboratory data analysis. The data were classified according to the treatment protocol given into two groups, both of which continued their treatment plan for a period of three years. Fifty children (Control group) who were treated with combination therapy (budesonide 80 mg /formoterol 4 mcg), two puffs twice daily. The Control group compared to fifty children (SLIT group) who were treated with the same combination therapy plus standardised extract 50/50 Dp / Df, a dust mite SLIT. The data analyses were conducted at baseline and after three years in each and in between groups.

Results: The results of this study showed that SLIT group has a highly statistically significant reduction in the use of daily doses of the combination treatment (budesonide / formoterol) (p<0.0001), in comparison to control group (p=0.397). In addition, in the SLIT group there were 97% of the patients totally stopped both control and reliever medications in the final six months and only continued with SLIT. Moreover, there were more improvements in FVC and FEV1 in SLIT compared to control group. Additionally, these results revealed that SLIT significantly reduced the clinical outcome scores. There were no systematic (anaphylaxis) side effects reported with SLIT.

Conclusions: The results of this study suggest that SLIT has a significant role in controlling AA due to dust mite in children. Besides, the results suggest that SLIT is a safe medication for children with AA. Caution must be applied when using the results of this study in practice due to the retrospective design of this study, which means that the findings may not be transferable to routine clinical practice.

P136  P81 - Clinical analysis of health education and self management combined with drug therapy in school-age children with asthma
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Clinical and Translational Allergy 2014, 4(Suppl 1) P136

Objective: To evaluate the effects of health education and self management intervention combined with drug therapy in school-age children with asthma.

Methods: 320 cases of school-age children with asthma were divided into management group and control group, two groups of children were receiving standardized drug inhalate treatment, management of children receive regular health education and self management behavior intervention.

Results: Times of asthma attacks, emergency and missing school days decreased significantly compared with the control group. Pulmonary function improved.

Conclusion: The health education and self management behavior intervention combined with drug therapy can improve the level of understanding of disease in children with asthma, medication compliance, reduce symptoms, improve lung function and improve the quality of life.

P138  P83 - Asthma inflammatory subtype specific treatment; a randomised clinical study
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Clinical and Translational Allergy 2014, 4(Suppl 1) P138

Introduction: Macrolides antibiotics, such as clarithromycin express immunomodulatory and tissue reparative effects that are distinct from their anti-infective properties, and have in vitro efficacy against neutrophils.

Aim of study: To determine the efficacy of add-on therapies that target eosinophilic and noneosinophilic airway inflammation and their effects on asthma control test, pulmonary function and asthma symptoms.

Methods: single blind randomized clinical trial; asthmatic children with persistent symptoms undergoing treatment with fluticasone 100 mg bid and β2 agonist as required were studied. Group A (23 males / 17 females, aged 11.5±1.8 years) received fluticasone 200mg bid, and group B (21 males/19 females, aged 11.5±1.8 years) clarithromycin 15 mg/kg bid, in addition to fluticasone 100 mg bid for 8 weeks. (FEV1%, C-CAT, SABA use, spumtan induced % of eosinophils and neutrophils) were compared before and after treatment in each group.

Results: In group A there is significant reduction of eosinophils percentage after treatment, and non significant increase in neutrophils percentage. There was significant improvement in FEV1% predicted. While in group B there was non significant decrease in eosinophils, and significant decrease in neutrophils. In group A there was significant negative correlation
between changes in FEV1% and change in eosinophils and week positive correlation between changes in FEV1% and changes in neutrophils. In group B there was significant positive correlation between basal eosinophils and change in FEV1% and significant negative correlation between basal eosinophils and change in FEV1%.

Conclusion: Steroids were effective in targeting eosinophilic inflammation and clarithromycin target neutrophilic inflammation. High eosinophils and neutrophils percentage in sputum are best predictors of response to steroids or clarithromycin treatment respectively.

P140
P85 - Asthmatic children and adolescents treated in daily medical practice – results from a 2-year sublingual allergen immunotherapy (AIT) study with grass pollen tablets
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Clinical and Translational Allergy 2014, 4(Suppl 1):P140

Background: The aim of this non-interventional study was to document the impact of a sublingual allergen immunotherapy (AIT) with Oralair 5-grass pollen tablets (Stallergenes, France) on symptom severity (rhinitis, conjunctivitis, asthma), use of symptomatic medication and tolerability in patients with grass pollen-induced allergic rhinoconjunctivitis (RC) over 2 years of routine medical practice treatment. This poster focuses on the subgroup of asthmatic children (4-11 yrs) and adolescents (12-17 yrs).

Methods: This prospective, open, non-controlled, non-interventional, multicenter study was conducted from September 2010 to October 2012 in Germany. Overall 1.482 patients (93 asthmatic children (6.2%), 73 asthmatic adolescents (4.9%)) participated in the study. The patients rated their symptoms as a combined score of severity (scale: 0 [none] – 3 [severe]) and frequency (scale: 0 [none] – 4 [very often]). In the combined RC score, the severity of rhinitis and conjunctivitis were pooled (scale: 0 [none] – 6 [severe]). In the asthma score, the severity and the frequency were pooled (scale: 0 [none] – 7 [severe]).

Results: During the season preceding AIT treatment 93/92% of children/adolescents with asthma had used symptomatic medication for RC symptoms. This rate dropped to 64/68% (1st season) and to 57/41% (2nd season). Likewise the RC score in these patients decreased from 4.06/4.13 to 1.86/1.82 (1st year) and to 1.33/1.59 (2nd year). Also the asthma score was reduced from 3.36/3.55 to 1.24/1.51 (1st year) to 0.71/1.13 (2nd year). An improvement in health status after two years of routine medical treatment was documented by 96/96%.

Conclusion: At baseline and during treatment: The incidence of non-fatal serious adverse events was 3.2/0.0%.

P141
P86 - Magnesium sulphate in the management of severe asthma and atelectasis
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Clinical and Translational Allergy 2014, 4(Suppl 1):P141

Introduction: Magnesium sulphate (MS), causes bronchodilatation by inhibiting bronchial smooth muscle contraction, interferes with parasympathetic stimulation, and prevents acetylcholine release to axon terminals [1]. It reduces inflammation by inhibiting mast cell degranulation and reduces thromb oxane, histamine and leukotrienes [2]. Some pediatric studies suggest that MS, b-2-agonists and steroids are beneficial in acute moderate/severe asthma by reducing hospitalization and absolute risk [3].

Objective: This paper 1) reviews the randomized controlled trials in the literature on use of MS in asthma and 2) reports the dramatic resolution of massive pulmonary atelectasis in an asthmatic child within 2 hours of IV MS.

Case Report: A 5-year-old boy with past asthma presented with rapidly progressing asthma unresolved by prednisolone and multiple doses of salbutamol, ipratropium bromide. Examination revealed tachypnea, tachycardia, chest recession, tracheal tug, right tracheal deviation, dullness and decreased breath sounds in right lower chest and wheezing in other areas. Percutaneous SpO2 was 86% (room air) and 95% with oxygen 5 L/minute. WBC 27.3 x 10^9/L, neutrophils 25.7 x 10^9/L, lymphocytes 1.1 x10^9/L, CRP was 11.6 (<10mg/L). Chest x-ray confirmed atelectasis of right middle and lower lobes. Antibiotics were started followed by IV methylprednisolone (1 mg/kg), aminophylline (10 mg/kg bolus), and MS (50 mg/kg). Chest findings normalized within 2 hours. SpO2 improved to 95% on 2 L oxygen/minute. Medication was discontinued save for salbutamol PRN, oral prednisolone (1 mg/kg/day), and MDI fluticasone 50 mcg (BD). On day 2, the child was active and playful. Chest examination and repeat chest x-ray were normal.

Conclusion: Review of literature and dramatic resolution of asthma-related massive atelectasis following intravenous MS in our case establishes MS as an adjunct to standard therapy in patients with severe, acute asthma including atelectasis.

P142
P87 - A national multicenter registration of treatment with omalizumab in Danish asthmatic children
Katrine B Spangenberg, Inger Merete Jørgensen, Susanne Halken, Lone Agertoft, Frederik Buchwald, Sune Rubak, Margrethe Friberg, Henrik Fomsgaard Kjær, Thomas Petersen Houmann, Thomas Kongstad
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Clinical and Translational Allergy 2014, 4(Suppl 1):P142

Background: In Denmark, Omalizumab is approved for treating children with severe persistent allergic asthma older than 6 years of age. No systematic registration of the efficacy in the Danish child population according to asthma symptoms or the efficacy on co-morbid allergic symptoms exists. A broad panel of outcome measures is necessary to evaluate the efficacy of Omalizumab treatment.

Aim: To provide a standardized systematic registration in order to create a database enrolling children with severe allergic asthma treated with Omalizumab.

Method and study design: A national multicenter registration and follow-up study based on children with clinical persistent severe allergic asthma including both retrospective and prospective registration.

Inclusion criteria: Children, 6-18 years of age, with severe persistent allergic asthma according to GINA treated with Omalizumab.

Outcome registration: A broad panel of outcome measures is measured at baseline and during treatment:

Outcomes: 
- Asthma exacerbations
  - Hospitalizations
  - Medication
  - Lung function
  - ACT score
  - Peak-flow
  - FeNO
  - Mannitol/Methacholin test
  - Skin prick-test
  - Quality of life score, (Juniper)
  - Rhinitis score, R-RTSS
  - SCORAD score

The monitoring plan and follow-up programme will be presented in a flowchart.

Conclusion: We believe that a national systematic registration will increase knowledge regarding efficacy of Omalizumab treatment in this rare group of severe allergic asthmatic children.
A retrospective audit of hospital based cow milk allergy testing in UK, we introduced fresh milk SPTs to compare the accuracy of skin prick testing to fresh cow milk versus the milk solution in predicting challenge outcomes. Medical histories were reviewed in group A and 268 in group B. There was no correlation with the values of the skin prick tests with age, sex or history of other food allergies. In April 2012 a protocol on the management of asthma exacerbation was established in our Emergency Department.

Objectives: Determine whether the implementation of a protocol meant an improvement in the compliance of the quality standards.

Methods and materials: The study was designed as retrospective and observational. The discharge reports of two cohorts of patients, attended at the Emergency Department of Hospital Universitario Rio Hortega, Valladolid, Spain, in total there were 27 patients who had cow's milk challenges during the 18 month period. 70% (n=19) of this group had a negative solution test, 37% (n=10) a negative fresh milk test and 37% (n=10) of them had negative tests to both the solution and the fresh milk.

Failed challenges: 15% (n=4) of the cohort failed the challenge (75% female) with ages ranging from 4 months to 5 years.

Types of reactions included vomiting as an immediate or delayed reaction, urticaria and angioedema.

The skin prick test values to solution ranged from negative to 4mm and for the fresh milk negative to 9mm. The biggest difference between solution and fresh values was 5mm. 75% of the patients who failed the milk challenge had at least one other allergic disease (Asthma, eczema and Rhinitis) or another food allergy but there was 1 patient (25%) who did not have any other allergic disease. Half of the children who failed had other food allergies, none had Asthma, 25% Rhinitis and 75% had Eczema.

Passed challenges: 85% (n=23) of our cohort passed the challenge (48% female) ranging from 5 months old to 14 years 9 months old (mean age, 318 months).

Solution SPTs ranged from negative to 4mm and fresh values ranged from negative to 10mm. 74% of those who passed the challenge had negative solution SPT versus 39% with negative fresh SPT. In all cases of those who tested positive to both the solution and fresh milk, the lower value was less than or equal to 4mm.

39% of those who passed both solution and negative SPT. The biggest difference between solution and fresh values was 10mm.

30% of these children had no other allergic diseases or food allergies. 35% had one other allergic disease and 17% had two other allergic diseases.

There was one girl (aged 14Y1M) who had all 3 allergic diseases (asthma, rhinitis and eczema) and also had other food allergies.

Conclusion: There was no correlation with the values of the skin prick tests values, solution or fresh, and the outcome of the challenge in our group of patients. As with most aspects of treating allergic patients the history plays the most significant role when deciding on treatment paths and challenges remain the gold standard.

Future: Repeating the audit with larger numbers of patients could yield a more consistent pattern and guidance for cut off levels.

As allergy testing becomes more sophisticated the use of recombinant provides another method of predicting allergic reactions and it is now a regular part of our clinical practice in addition to skin prick tests.
P146

P91 - Pilot study on sensitisation profiles of children with a primary tree nut allergy

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Clinical and Translational Allergy 2014, 4(Suppl 1):P146

Background: Plant food allergy is a relatively frequent medical problem in childhood. Peanut and tree nuts are the most common causes. Some are allergic to tree nuts due to pollen cross reactivity whereas others have a primary tree nut allergy. Cross sensitivity is also seen between tree nuts and is serologically well described. But the clinical picture of cross sensitivity amongst tree nut allergic children is less investigated.

Aim: We aim to investigate sensitization patterns and clinical reactions of the most common and clinical relevant tree nut allergies in Denmark. We want to explore this profile in children and young adults suspected of having a primary tree nut allergy.

This pilot study will be used as a guide for a study with a larger set up including controlled oral food challenges (OFCs) to confirm allergy or ensure absence of allergy.

Our aim is to recruit 40-50 and each participant shall undergo OFCs with four nuts.

Methods: Children and young adults (age 0-23) with sensitization to tree nuts were sought out in our IgE (ImmunoCAP®) database. Medical files of patients with IgE-levels to hazelnut > IgE to birch pollen OR with positive (>0.35 kIU/L) specific IgE to any other tree nut were identified. These selection criteria were used as indications for a primary tree nut allergy.

Medical files on 28 children ages 0-16 were randomly selected. Medical history including prior exposure and allergic reactions to plant foods and tree nuts was obtained from the files. Inclusion criteria were the primary indications together with a medical history of an allergic reaction to a tree nut.

Results: 197 patients had IgE-levels to hazelnut > IgE to birch pollen OR another positive specific IgE to a tree nut.

- Of the 28 screened 19 had a medical history with at least one allergic reaction to tree nuts.
- Out of the above mentioned 19 children n=30 had a history with a positive reaction (ranging from mild to severe symptoms) to the following plant foods; Hazelnut (n=14), Peanut (n=8), Cashew (n=3), Pistachio (n=5), Almond (n=2), Walnut (n=7), Coconut (n=1), Sesame (n=2), Poppy seed (n=2), Sunflower seed (n=1), Soy (n=1), Pine nut (n=1).

Conclusion: This study suggests that we can expect that n=30 patients attending our clinics are eligible for the OFC project.

Deducted form the medical records hazelnut, walnut, pistachio and cashew were the four most common tree nuts involved in prior allergic reactions.

P147

P92 - The prevalence of food sensitisation in children suffering from eczema

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Clinical and Translational Allergy 2014, 4(Suppl 1):P147

Background: Atopic dermatitis (eczema) is a highly pruritic chronic inflammatory skin disease. Food allergy has been strongly correlated with the development of persistence of atopic dermatitis.

Aim of the study: To investigate the association of food allergy in Greek children with atopic dermatitis.

Patients and methods: Eighty-eight (88) children with eczema (59 boys and 29 girls) aged between 12 months and 6 years were studied. All the children underwent allergological investigation with assignment of specific IgE antibodies (Elisa Method) to the following food allergens: casein, egg white, a-lactalbumin, β-lactoglobulin, milk proteins, egg yolk, beef, soy, wheat, and cod.

Results: Food sensitization occurred in 39 out of 88 children (44%). The frequency distributions for elevated specific IgE antibodies to various food allergens in children with eczema are shown in the following Table (Table 1). Conclusion: Food sensitization has a high prevalence of almost 44% among children with eczema.

Table 1(abstract P147) Frequency distributions of food sensitization in children with eczema

<table>
<thead>
<tr>
<th>Food Allergen</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk proteins</td>
<td>27</td>
<td>25.00%</td>
</tr>
<tr>
<td>Egg white</td>
<td>22</td>
<td>21.00%</td>
</tr>
<tr>
<td>a-lactalbumin</td>
<td>21</td>
<td>20.00%</td>
</tr>
<tr>
<td>Egg yolk</td>
<td>12</td>
<td>11.00%</td>
</tr>
<tr>
<td>β-lactoglobulin</td>
<td>10</td>
<td>9.00%</td>
</tr>
<tr>
<td>Wheat</td>
<td>8</td>
<td>7.00%</td>
</tr>
<tr>
<td>Casein</td>
<td>3</td>
<td>3.00%</td>
</tr>
<tr>
<td>Soy</td>
<td>3</td>
<td>3.00%</td>
</tr>
<tr>
<td>Cod fish</td>
<td>1</td>
<td>1.00%</td>
</tr>
<tr>
<td>Beef</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100%</td>
</tr>
</tbody>
</table>

P148

P93 - The role of allergy evaluation in children with eosinophilic esophagitis

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Clinical and Translational Allergy 2014, 4(Suppl 1):P148

Aim: Eosinophilic esophagitis (EOE) is a chronic inflammatory disease of the esophagus immune/antigens mediated. It is clinically characterised by symptoms related to esophageal dysfunction and associated with eosinophil-predominant esophageal inflammation. The role of atopy has been clearly demonstrated both in epidemiological and experimental studies and has important implications for diagnosis and therapy. The aim of this study was to assess the relationship between food allergy and eosinophilic esophagitis in the pediatric population, as well as the effect of dietary modifications in patients’ clinical symptoms.

Methods: Thirty-six children aged 7 months to 12 years (median age 80 months), with EoE (esophageal symptoms, biopsy with >15 eosinophils/HF after the patients have been treated with a PPI for at least 4-8 weeks and other causes have been excluded) were included to group I. Twenty age and sex matched, apparently healthy, infants and children were studied as control group (group II). Serum specific IgE to cow milk, egg, wheat, rice, corn, soy, chicken, potato, beef, peanut and pork were measured with the CAP-FEIA. Skin prick tests and atopy patch tests (using fresh foods) were performed for the same allergens.

Results: All children in control group had negative CAP, SPT and APT to all food allergens. In group I 30/36 children (83%) had positive APT. Of these, 12/30 (40%) had positive SPT and 16/30 (53%) had also positive CAP. Of the 30 positive children 4 (4/30, 13%) had positive APT to one food allergen, 3/30 (10%) had positive APT to two food allergens and 23/30 (77%) to 3 or more food allergens. In the APT-positive children, in group I, withdrawing the suspected food allergens for an 8 week period resulted in the improvement of symptoms.
Conclusion: Food allergens seem to be a significant etiologic factor for eosinophilic esophagitis in infants and young children. Skin tests are able to identify, in most of the cases, the responsible food allergens leading to dietary modifications and symptom remission.

P149

P94 - Food allergy in children - are we following NICE (National Centre for Clinical Excellence) guidelines in documentation?
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Clinical and Translational Allergy 2014, 4(Suppl 1):P149

Background: Food allergy in children is increasingly diagnosed in recent years. While few hospitals in UK have a dedicated allergy service, many of these children are investigated by their general practitioners, paediatricians, nurse practitioners and other paediatric specialties. NICE has recently introduced guidelines on documentation of suspected food allergy in children (2011).

Aim: Our aim was to compare documentation of children seen in outpatient clinic with suspected food allergy (tertiary children’s hospital without a dedicated allergy service) to NICE guidelines.

Methods: We identified all patient clinic letters with food allergy over one year period (April 2010-11). After modifying the NICE audit proforma, we collected further information including the professional who referred these children, team reviewing them and management including discharge planning or referral to other specialties. We also collected information on final diagnosis and any referrals made to school/nursery and dietician.

Results: We reviewed 50 of 100 eligible notes in detail. The children (aged between 4 months and 12 years) were referred mainly from GPs (64%). Most of these (80%) were seen in clinic either by Consultant Paediatrician or by allergy nurse. Egg, fish, nuts, fish were commonest allergens (total of 90%). 45 children (90%) had either specific IGE (80%) or skin prick tests (10%) performed. Final diagnosis was documented in 35 (70%) of these children (20- Definite documented food allergy, 4- Food aversion/refusal, 3- Not at risk, 2- CMPD, 2- Not food allergy, 1- Abdominal migraine). Discussion regarding adenalin auto injector was documented in 15 (30%) and 5 (10%) had these prescribed. Less than 30% had dietitian or school referral documented. 42% were discharged while 64% were still being followed up.

Conclusions: We found good documentation of signs and symptoms with food, suspected allergen, allergen avoidance and advice on avoidance of suspected allergen (80-90%). Improvement in documentation could be achieved in family history of atopy, examination of atopy and growth, documenting final diagnosis, management, adenalin auto-injector, referrals to dietitian and school/nursery (40-70%).

Recommendation: Proforma was developed based on NICE guidelines for documentation of allergy based history and examination. We are planning to develop “one stop allergy clinic” in near future.

P150

P95 - Cow’s milk allergy with tolerance to sterilised cow’s milk. A case report
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Clinical and Translational Allergy 2014, 4(Suppl 1):P150

Introduction: Allergy to cow’s milk (CM) proteins has as major allergens caseins (60%), β-lactoglobulin (9%) and α-lactalbumin (4%). Thermal processes for milk industrialization include: pasteurization (low: 63 °C for 30 min or High: 72 °C for 15 seconds), UHT heating (145 °C for 1-2s) and sterilization (115 °C for 15 min). It’s accepted that these processes denature milk proteins in different proportions without having an effect on antigenicity or allergenicity.

Case report: A 2 years old boy, exclusively breastfed up to 3 months and then fed with adapted infant formula with good tolerance until 18 months. Referred by his pediatrician with suspected CM allergy because of immediate perioral erythema and pruritus after consumption of milk and some dairy products (yoghurt) during the 2 last months. However, he tolerates a sterilized cow’s milk and cheese. He hadn’t got any concomitant systemic symptoms like dyspnea, vomiting, or diarrhea. Skin test were performed: CM (5mm), α-lactalbumin (24mm), β-lactoglobulin (11mm), casein (20mm), sterilized milk (SM) (3mm), pasteurized milk(PM) (11mm), UHT milk (UM) (GAM: Histonime (6mm) and Saline (0mm). Provocation test with yoghurt: Positive (cervicofacial urticaria). SM, PM and UM extracts were analysed using SDS-PAGE and immunoblotting with patient’s serum and with a pool of sera from CM allergic patients. Patient’s serum recognized a band of about 13 kDa [molecular weight described for the alpha-lactalbumin] 14 kDa) in the UM and PM, but not in sterilized milk.

Comments: The patient has a primary sensitization to α-lactalbumin protein fraction of cow’s milk. According to our study, this fraction is not recognized by the patient in sterilized milk so we conclude that, in contrast to the accepted, this method of treatment do alters the structure of at least this fraction of the milk which decreasing its allergenicity. We cannot demonstrate this with other industrial processes.

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P97 - Characteristic of protein sensitisation in infants
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Background: Cow milk protein sensitisation is common in bottle-fed infants. It is known about immunological cross-reaction for cow and goat milk protein.

Methods: We examined 85 infants (39 girls, 46 boys), 1.5 – 18 months old, who were fed by artificial milk formulas. Gastrointestinal symptoms of food allergy were diagnosed in 45 (52.9%) children with diarrhea and in 40 (47.1%) children with constipation. The control group consisted of 25 healthy infants of the same age. The level of total IgE, cow and goat milk proteins IgE allergenspecific antibodies in coprofiltrates were measured by immunoenzymometric method using the spectro-photometer “Sunrise” (Belgium), with test-systems “Allergopharma” and “Dr. Fooko” (Germany).

Results: The highest rate of sensitisation to cow milk protein (89%) was found in infants of 1.5-6.0 months old compared to infants of 6.5-12.0 (75%) and 12.5-18 months old (56%). Increased level of total IgE in coprofiltrates was more common in infants of 1.5-5.5 months old, too, compared to infants of other ages (33%, 25% and 22%, respectively). The sensitisation to goat milk protein was more common in infants of 6.5-12 months old (59%) and 12.5-18.0 months old (45%) compared to younger (1.5-6.0 months old) infants (23%). In infants of any ages sensitisation to cow milk protein was more frequent than to goat milk proteins.

Conclusion: Increasing rate of sensitisation to goat milk protein in bottle-fed infants more than 6 months old, probably, depends on immunological cross-reaction for cow milk protein.

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P98 - Gluten allergy
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Background: Gluten is a mix of cereals proteins (glutenins and gliadins) and can cause two distinct immunological diseases: celiac disease and IgE-mediated gluten allergy (GA). There are few cases of GA reported and little is known about its natural history.

Methods: Description of GA in children followed at ours Pediatric Allergy Clinic: clinical manifestations, laboratory data, comorbidities and follow-up.

Results: Nine children with GA are followed at our Pediatric Allergy Clinic, with ages ranging from 1-14 years and 8 are boys. Early presentation occurred between 5 and 9 months of age: 6 with cutaneous manifestations, 2 with gastrointestinal manifestations and 1 with anaphylaxis. The route of sensitization was cutaneous (with oat cream) and by food ingestion. Serum
specific IgE to gluten ranged from 0.73 to 100KU/L. Four children had specific IgE to other cereals without gluten (corn and rice). All children exhibited other atopic diseases. Eight children had multiple food allergies (egg, milk or fish). Four children developed respiratory allergy (asthma and rhinitis) and 2 of them had specific IgE to cereals pollens. All children adopted a gluten free diet and have adrenaline self-injectors. Two patients suffered anaphylaxis episodes after the diagnosis and 3 children resolve their GA (1, 2 and 6 years).

Conclusions: GA is a rare disease, and can be life-threatening. Clinical presentation occurs in the first year of life and cutaneous manifestations are the most common. This allergy may resolve during childhood or become persistent. Atopic dermatitis can be an early manifestation of disease and the route of sensitization can be cutaneous. Exacerbation of atopic dermatitis with oat creams may alert to this diagnosis. Multiple food allergy is frequent in children with GA.

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P99 - Clinical effectiveness of the goat milk-based formula with prebiotics in infants with atopic dermatitis
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Background: Atopic dermatitis (AD) in most of infants is associated with food allergy; cow milk proteins are a main antigen in 80-90% cases. The aim of study is examination of the clinical effectiveness of the goat milk-based formula with prebiotics in infants with AD aged 6-12 months old.

Methods: The examination included 50 formula-fed infants with AD aged 6-12 months old. The main group (n = 30) comprised infants, who received the goat milk-based formula with prebiotics. The reference group (n = 20) - infants, who received a formula based on soy protein isolates. All the patients received standard therapy for AD (antihistamine drugs, local anti-inflammatory therapy, therapeutic and cosmetic skin care, etc.) that did not differ in both groups. The effectiveness of the administered therapy was assessed on the basis of the dynamics of clinical symptoms of disease according to SCORAD score, and also by decrease of total IgE level in serum. The level of total IgE was measured by immune-enzymatic method using the spectrophotometer “Sunrise” (Belgium).

Results: In the main group, the clinical effectiveness of the formula with prebiotics based on New Zealand goat milk amounted to 76.7% (average duration of the exacerbation period – 13.0 ± 1.5 days, the SCORAD index decreased by 3.7 times – from 30 to 8 scores), in the reference group – 40% (average duration of the exacerbation period – 27.0 ± 1.7 days, the SCORAD index decreased by 2 times – from 34 to 17 scores). The analysis of results of immunological evaluation revealed that initial level of serum total IgE was increased in 82% patients of the main group, mean level was 260 IU/ml. After therapy the mean level of serum total IgE decreased by 2.7 times – to 95 IU/ml. In the reference group initial level of serum total IgE was increased in 80% patients, after complex therapy it decreased by 1.8 times – from 262 to 145 IU/ml.

Conclusion: The adapted formula based on goat milk with prebiotics for 6-12 months old infants may be recommended as a dietary product for formula-fed infants with AD.

P100 - Artificial food additives as the cause of chronic soiling in a 14 year old male
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A 14 year old boy was referred by his GP after persisting requests by his mother for investigation of a food allergy as a possible cause for 6-year history of soiling. He was not conscious of his bowels being opened and this would happen several times a day. Paediaticians claimed a psychological reason, which the patient and his mother denied categorically.

- Symptoms inconsistent with allergy
- The Neurologists excluded spina bifida
- Returned to the Immunology clinic and it was revealed that he had been referred to the Paediaticians 7 years ago for bloating, flatulence and IBS symptoms and had been diagnosed as having constipation and treated for it ever since. His mother insisted that the anti-constipation treatment aggravated the flatulence and bloating, but the treatment was still recommended as essential.

On direct questioning his diet it appeared that his diet, although controlled in terms of calories and fat content (he was overweight for his age), was rich in food chemicals and especially diet drinks, so a strict additive-free diet was advised for 6 months (most food chemicals take 2 months to be excreted from the body).

His symptoms resolved completely within a few weeks.

In experimental animals artificial food additives are known to influence the lower gastrointestinal tract under some defined conditions, resulting in morphological alterations in the mucosa and other tissues, deranged absorption and excretion of nutrients, and, in some cases, injury to other organs and tissues as a secondary phenomenon. This influence has been definitely reported in humans only for sulphites which can cause loose stool and diarrhoea. These chemicals are contained in alcohol and also cause the "salad bar syndrome".

In this case the diet did not obviously contain sulphites, suggesting that the complete remission of symptoms was achieved by the exclusion of the common food chemicals usually contained in a teenager’s diet.

Cite abstracts in this supplement using the relevant abstract number, e.g.: Tsakona. P100 - Artificial food additives as the cause of chronic soiling in a 14 year old male. Clinical and Translational Allergy 2014, 4(Suppl 1)P155