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## 239. Paediatric respiratory epidemiology: rare diseases, infectious diseases and asthma

### P2350

#### Incidence and natural course of CCAM in the N. Irish population

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Congenital cystic adenomatous malformations (CCAM) are detected antenatally and occur more frequently than the 1:25,000 previously described. Many regress antenatally and are asymptomatic. Postnatally some undergo complete or partial resolution. Complications include pneumonia, pneumothorax and rarely malignancy.

**Aim:** To determine the incidence and early natural history of CCAM.

**Data collection:** Review of children born with CCAMs between 1994–2006 in N. Ireland (static population 1.7 million). Management practice changed from early surgical removal to a conservative approach allowing a period (2–4 years) for potential post natal resolution.

**Results:** 23 radiological diagnoses of CCAM (CT scan). In the last 6 years the incidence of CCAM is estimated to be at least between 1:4500 to 1:7000 live births whereas it was approximately 1:25000 for 1994–1999. 11 infants underwent early surgical resection and in two of these children following surgical excision further lesions subsequently developed in another lobe (1) or on both lungs (1). 12 asymptomatic infants with localised CCAMs were treated conservatively. The lesion resolved spontaneously on follow-up CT scan in 2 (2/12, 16%). In two cases further lesions were noted to have developed in other regions of the lungs. Early surgical resection of these isolated lesions would have given false reassurance for future risk of complications.

**Discussion:** The incidence of radiological CCAM at 1:4500 to 1:7000 is much higher than previously reported likely due to better antenatal USS. We have found that in asymptomatic infants with initial localised and seemingly 'operable' CCAMs over time the lesions are as likely to become multiple as they are to spontaneously regress.

### P2351

#### Congenital cystic adenomatoid malformation with coexisting congenital heart disease: a case series

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**Introduction:** Congenital Cystic Adenomatoid Malformation (CCAM) is a rare lung lesion in children. It is mostly isolated but 10% of cases, usually Type 2 have coexisting anomalies and only 3% have coexisting cardiac anomalies.

**Aim:** Lack of database on these patients in our part of the world warrants a review of our cases to serve as baseline study.

**Methods:** A 31-year archival review of CCAM cases in our center is done. The slides, 2-D echo, and charts are reviewed for clinicopathologic correlation.

**Results:** We have 17 CCAM cases of which 3 are Type 2 with coexisting cardiac anomalies. All 3 cases presented with cyanosis and dyspnea. The first is a biopsy case of a 20 day old male with Atrial Septal Defect (ASD) primum type. Another biopsy case is a 1 year old female with Total Anomalous Pulmonary Venous Return to the Superior Vena Cava and ASD secundum type. Both were discharged improved and are well on follow-up. The third is an autopsy case of a 3 month old male with coexisting Truncus Arteriosus Type IV.

**Conclusion:** Histopathologic evaluation is needed to determine the type of CCAM to exclude possible associated anomalies. Our three cases initially presented with

cardiac symptoms hence the diagnosis of congenital heart disease by their respective referring physicians. Only after work-up and finally by histopathology was the diagnosis of CCAM established. Given the rarity of CCAM with associated cardiac anomalies, prompt clinicopathologic correlation and understanding of its pathophysiology is needed for better prognosis.

### P2352

#### An outbreak of streptococcus pneumonia serotype 1 pneumonia in a UK primary school

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**Background:** Pneumococcal pneumonia is usually considered to be relatively non-contagious, and outbreaks caused by serotype 1 have not been previously reported in UK school children. We describe a small outbreak amongst young children. Five cases of radiologically confirmed lobar pneumonia were detected in children aged between four and five years attending a primary school reception class between October and November 2006. All were shown to be due to *S.pneumoniae* serotype 1 either by positive blood culture or serotype specific urinary antigen. The clinical course was complicated in one patient who developed empyema thoracis requiring surgery. Public health actions were taken to reduce the risk of further transmission. All contacts were offered chemoprophylaxis and pneumococcal vaccination, and no further cases have occurred. The mechanism of transmission remains uncertain, as serotype 1 is rarely recovered from the nasopharynx of healthy subjects.

**Conclusion:** This outbreak demonstrates a further change in the epidemiology of the organism. The exponential increase in incidence of parapneumonic empyema seen in UK children over the last decade is also associated with serotype 1 disease, and suggests that the effective virulence of serotype 1 disease is changing in a complex fashion. It is not yet known whether these changes are due to changes in the host, organism or environment or some combination of these factors. This is a cause for concern, particularly as serotype 1 is not covered by the conjugate pneumococcal polysaccharide vaccine recently introduced into the UK vaccination programme.

### P2353

#### The Russian registry of cystic fibrosis

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The Russian registry of Cystic Fibrosis began collecting data on Russian cystic fibrosis patients in 2001. The information can be used in clinical work and research. The database of registry includes 463 parameters, which are grouped in 55 tables (438 parameters are dynamic). The registry consists of the following sections: personal data, anamnesis, data of out-patient examination (every 3 months), data of hospitalization. Now registry contains the information on 641 patients (340M/311F aged 1mth-34 yrs), 578 patients alive, 63(9.8%) died. 189 (29.5%) patient constantly live at Moscow and Moscow region.

The following data were received with the help of the registry: severe CF symptoms have 452 (70.5%) patients, 636 (99.2%) have pancreatic insufficiency. The most often complications CF were liver cirrhosis-77(12%), chronic lung heart-48 (7.5%), diabetes mellitus-24 (3.7%) patients. Genotype analysis had been performed on 281(43.8%) of these patients: 187 (66.5%) carries delF508 mutation. The basic treatment includes pancreatic enzymes (100% patients), vitamins (100%), mucolytics (90%), UDCA (88%), rhDNase (30%). The Russian CF registry will allow to quickly analyze the information on all patients observed at the Russian CF centre, and also to exchange the information with the regional CF centers.

### P2354

#### Evaluation of sleep quality and anxiety-depression parameters in parents of the children with bronchiolitis obliterans

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**Objective:** The aim of this study was to evaluate the sleep quality and parameters of anxiety and depression in the parents of the children with bronchiolitis obliterans (BO).

**Material and Methods:** The study group consisted of the parents of 18 children with BO and the parents of 31 healthy children. Pittsburgh Sleep Quality Index (PSQI) and Hospital Anxiety and Depression Scale (HADS) were applied to the parents. As the score increases in PSQI, sleep quality decreases.

**Results:** The patient group comprised 18 children with a mean age of 42.9±31.0 months. The control group comprised 31 healthy children with a mean age of 46.21±17.6 months. Total PSQI scores of the parents of children with BO were significantly higher than those of the parents of healthy children (p=0.001). Among the 36 parents in group with BO, 13.9% had healthy sleep, 38.9% had bad sleep and 47.2% had chronic sleep disorder. However, among the 62 parents in the control group, 82.3% had healthy sleep, 14.5% had bad sleep and 3.2% had chronic sleep disorder. Subjective sleep quality scores of the parents of children with BO were significantly higher than those of the parents of healthy

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children ( $p=0.001$ ). Subjective sleep quality scores were not significantly different between mothers and fathers of two groups ( $p=0.6$ ,  $p=0.7$ ). Total PSQI scores of the parents of children with BO were correlated with anxiety sensitivity ( $r=0.35$ ,  $p=0.03$ ).

**Conclusion:** In this study, it was found that the parents of children with BO have a lower sleep quality. Therefore, the parents of children with BO need to be assessed for the requirement of support regarding sleep quality and anxiety.

#### P2355

##### Early respiratory morbidity in a multicultural birth cohort: the Generation R study

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Genetic factors and pre- and postnatal exposures influence the development of respiratory symptoms in the first months of life. We investigated whether ethnicity affects the risk of early respiratory morbidity.

**Methods:** Generation R is a multicultural birth cohort in Rotterdam. We assessed exposure to risk factors for respiratory morbidity by questionnaires administered longitudinally during pregnancy and when infants were 1 and 6 months old. Logistic regression was used to investigate the relation between ethnicity and lower respiratory symptoms (LRS: cough, wheeze, shortness of breath) at 1 and 6 months, while controlling for other relevant factors. Results are reported as adjusted odds ratio (OR [95% CI]).

**Results:** Data were available for 3,287 infants at 1 month (Dutch(D)=2,568, Cape Verde(CV)=72, Morocco(M)=153, Dutch Antilles(DA)=89, Suriname(S)=213, Turkey(T)=192) and for 2,555 infants at 6 months of age (D=2,021, CV=41, M=110, DA=70, S=156, T=157). Compared to Dutch, Moroccan ethnicity was associated to a lower risk of respiratory symptoms at 1 month of age (OR=0.7 [0.5-0.9]). Male gender (OR=1.2[1.1-1.4]), maternal smoking in pregnancy (OR=1.2[1.1-1.5]) and maternal atopy (OR=1.2[1.1-1.4]) were independent risk factors for LRS at 1 month. Moroccan, Surinamese and Turkish ethnicity, compared to Dutch, significantly reduced the risk of LRS at 6 months of age (OR=0.5[0.3-0.7], 0.5[0.4-0.7] and 0.5 [0.4-0.7], respectively).

**Conclusions:** Lower respiratory symptoms in the first 6 months of life were independently associated with ethnicity, and were less frequently reported for children of non-Dutch ethnicities. Whether these reported findings reflect true differences remains to be examined.

#### P2356

##### Non-specific chronic cough in children: a novel approach to phenotype identification

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**Background:** Non-specific chronic cough is a frequent problem in paediatric primary care. While some authors have proposed that many affected children suffer from a variant form of asthma, others have contested this.

**Objective:** Using a novel statistical approach, we investigated if there was evidence for the existence of several distinct clinical phenotypes within the group of children with chronic cough.

**Methods:** From a prospective population-based cohort study of 1650 children all those with wheeze or chronic cough during preschool years and a random sample of asymptomatics were invited to the lab. We applied finite mixture modelling to data on symptoms, skin-prick tests, lung function (LF) and airway responsiveness (AR) (N=319). Identified phenotypes were compared with respect to risk factors and outcomes in subsequent surveys.

**Results:** The model identified two phenotypes of chronic cough. Phenotype 1 (n=86) was persistent with slightly lower LF and higher AR than asymptomatic children, while phenotype 2 (n=79) was transient, with normal LF and AR. Compared to children with phenotype 2, those with phenotype 1 had a significantly higher prevalence of current wheeze (24% vs. 7%,  $p=0.011$ ) and use of asthma inhalers (26% vs. 4%,  $p<0.001$ ) 5 years later and of parental smoking in early life (52% vs. 33%;  $p=0.017$ ).

**Conclusions:** This novel data-driven approach allowed to identify 2 distinct phenotypes of non-specific chronic cough in preschool children, one of which indeed has features compatible with cough variant asthma. Validation in independent cohorts using this approach should lead to a clearer understanding of the aetiology and help to improve management of children with chronic cough.

#### P2357

##### Infants with recurrent lower respiratory tract symptoms – who benefits of extensive investigations?

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There is limited information on lung function and exhaled nitric oxide fraction (FeNO) in infants with recurrent lower respiratory tract symptoms. In 2000–2003, 201 recurrently symptomatic infants were referred to a tertiary center for

further investigation. As part of the clinical investigation, whole-body plethysmography, tidal FeNO measurements, and skin prick tests were performed. In addition, 77 (38%) of the children underwent bronchoscopy. Increased work of breathing in clinical examination (in 22%), and abnormal chest radiograph (in 30%), were associated with decreased airway conductance (sGaw z-score  $\leq -1.65$ ) ( $p<0.001$  and  $p=0.048$ , respectively) and hyperinflation of the lungs (FRC z-score  $\geq 1.65$ ) ( $p=0.004$  and  $p=0.038$ , respectively). Exposure to environmental tobacco smoke (ETS) was associated with FeNO  $\geq 40$  ppb ( $p=0.009$ ). Increased work of breathing, sGaw z-score  $\leq -1.65$ , and FRC z-score  $\geq 1.65$ , were associated with low FeNO ( $p=0.002$ ,  $p=0.005$ ,  $p=0.026$ , respectively). A definitive diagnosis was made in 184 (92%) children; asthma was diagnosed in 149 (74%), infection in 23 (11%), and a structural abnormality in 12 (6%). Abnormal findings in clinical examination predicted the diagnosis of asthma or a structural abnormality in 96% of cases, whereas in children with underlying respiratory infection or no definitive diagnosis, clinical examination was normal in 92% ( $p<0.001$ ). In conclusion, clinical findings of bronchial obstruction predict well lung function and the diagnosis of asthma in recurrently symptomatic infants. FeNO is affected by ETS exposure, clinical state of the child, and the used methods, and the information obtained should be interpreted with care.

#### P2358

##### Prevalence of respiratory pathogens in children hospitalized with lower respiratory tract infection

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**Background:** The contribution of respiratory pathogens to hospitalization of children with a lower respiratory tract infection (LRTI) is not clearly defined and many cases remain uncharacterized. Aim of the study was to determine the prevalence of respiratory pathogens, including recently recognized viruses, in children hospitalised for LRTI.

**Methods:** Nasopharyngeal swab samples were collected between September 2006 and February 2007 from 126 children, aged 1 month to 14 years old, admitted to two paediatric wards, because of LRTI. Genetic material was extracted and PCRs were performed for detection of *Mycoplasma pneumoniae*, respiratory syncytial virus (RSV), adenoviruses, coronaviruses (HCoV) and human bocavirus (HBoV).

**Results:** Current infection due to *M. pneumoniae* was diagnosed in 9 (7%) children, aged 4–13 years, presented mainly with pneumonia. RSV was detected in 7 (5.7%) children, aged 2 months – 3.5 years, most of them with acute bronchiolitis. Adenoviruses were detected in 14 (11%) preschool children with acute bronchiolitis or pneumonia; eleven of them presented during a 2-month period with an outbreak form. HBoV was detected in 10 (8%) children aged 2 months – 4.5 years with acute bronchiolitis or broncho-pneumonia. Dual infections were identified in 3 (2.4%) children while one triple infection was also present.

**Conclusions:** Atypical pathogens and respiratory viruses are responsible for a large number of LRTI cases. Clinical characteristics of children diagnosed with *M. pneumoniae*, RSV and adenovirus infection are relatively distinct. HBoV, a potential causative agent of LRTI, is frequently detected in preschool children with acute bronchiolitis or broncho-pneumonia.

#### P2359

##### Etiology and clinical outcome of community-acquired pneumonias in hospitalized children

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**Introduction:** Etiology of childhood community-acquired pneumonia is still poorly defined. This often leads to inappropriate use or overuse of antibiotics which can result in treatment failure and increase bacterial resistance.

**Aims and objectives:** To determine etiology and clinical outcome of community acquired pneumonia in hospitalized children.

**Methods:** A prospective evaluation of children hospitalized between 10/2006 and 2/2007 at our department with community acquired pneumonia was performed. Positive hemoculture, pneumococcal antigen in the urine and a 4 fold increase of antibody titer in paired sera was considered proof of etiology. We evaluated levels of CRP, white blood cell counts, differential counts, and clinical signs like duration of fever and oxygen dependence.

**Results:** 43 patients aged 1–18 years were involved in the study. Etiology of pneumonia was proven in 79 % of patients, 53 % being pneumococcal infections, 41 % being *Mycoplasma pneumoniae* infections, and 6 % being viral infections. No chlamydial infections were detected. The level of inflammatory markers was indicative of bacterial etiology, but not of the disease severity.

**Conclusions:** In this pilot study we confirmed the importance of pneumococcal infections in all age groups as well as the importance of *Mycoplasma pneumoniae* infections especially in the adolescent age group. Detection of only 2 viral infections was probably caused by methodological problems. We plan to improve the diagnosis of viral infection by direct viral antigen detection in nasopharyngeal

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secretions. Our results will improve appropriate antibiotic use, help more effective initial treatment and also prevent increase of bacterial resistance.

**P2360****Increased concordance of severe respiratory syncytial virus infection within identical twins**

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**Background:** We estimated individual differences in the severity of respiratory syncytial virus (RSV) infection attributable to genetic and environmental factors. **Methods:** Record linkage data on hospitalisation due to RSV infection was gathered on all live twins (12,346 pairs) born in Denmark between 1994 and 2003. Latent factor models of genetic and environmental effects were fitted to the observed data using maximum likelihood methods.

**Results:** Identical twins resembled each other significantly more than fraternal twins for RSV hospitalisation (concordance rates 0.66 vs. 0.53,  $p=0.02$ ) suggestive of genetic influences on disease severity. Genes accounted for 16%, family environment for 73%, and non-shared environment for 11% of the individual susceptibility to develop severe RSV infection.

**Conclusions:** The severity of RSV infection is determined partly by genetic factors. This result should stimulate the search for molecular genetic markers of disease severity.

**P2361****Variation at the IL13-IL4 locus infers susceptibility to severe RSV bronchiolitis in infancy**

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Both the innate and cell-mediated immune responses have been implicated in the pathogenesis of severe RSV disease in infancy. The Th2 cytokine locus at 5q31 is likely to be an important determinant of host T-helper cell responses to antigen and infection.

We investigated in detail a 656kb segment at 5q31 containing 13 genes including *IL3*, *CSF2*, *IRF1*, *IL5*, *IL13* and *IL4*, and all known intergenic regulatory elements. 113 Single Nucleotide Polymorphisms (SNPs) were genotyped in a representative European population and population haplotypes were inferred. A subset of 37 haplotype-tagging SNPs, which together represent the majority of haplotypic diversity were then genotyped in 415 cases with severe bronchiolitis and 570 ethnically matched controls. 6 of these SNPs spanning *IL13* to *IL4* were genotyped in a further 370 cases and 570 controls. A risk haplotype spanning *IL13-IL4* was found to be correlated with disease status in infants under 6 months of age with no pre-defined risk factors. (OR 1.69  $p=0.00037$ ).

One approach in ascribing functionality to a haplotype is to demonstrate sequence-specific variation in gene expression. For an individual that is heterozygous at an exonic SNP in a given gene, relative quantification of mRNA produced by each gene copy can be determined. Allele-specific differences in gene transcription can then be correlated with differences in the haplotypic makeup of the two chromosomes carried by that individual. Using allele-specific transcriptional quantification (ASTQ) we screened 90 CEPH cell lines (EBV-immortalised B cells) using Sequenom Massarray, and report increased expression of *IL13* for the disease risk haplotype.

**P2362****Sleep disorder questionnaire and its correlation with academic performance and Connors performance test**

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Sleep disorder questionnaire and its correlation with academic performance and Connors performance test.

Sleep disordered breathing (SDB) is frequent in children and has been related with poor school performance and attention deficit/hyperactivity disorders (ADHD). The aim of this study was to assess if SDB evaluated by a sleep questionnaire (SQ) correlates with school performance and ADHD.

**Methods:** A 13 question SQ and the Connors performance test(CPT) were performed to school age children/adolescents of a private school in Santiago, Chile. Statistics: descriptive statistics are presented as mean an SD for age. Spearman Rho test were performed for correlation within questionnaires and with school marks.

**Results:** 272 children/adolescents (136 males) completed the questionnaire. Age: 11.7±3.1 years. SQ had positive correlation with CPT( $r=0.32$ ;  $p<0.05$ ), no correlation with overall marks ( $r = -0.113$ ;  $p=0.063$ ), but mild negative correlation with Spanish language marks ( $r = -0.151$ ;  $p<0.05$ ). Specific questions of the SQ had mild negative correlation with Spanish language marks: morning headache ( $r = -0.131$ ;  $p<0.05$ ), daytime sleepiness( $r = -0.192$ ;  $p<0.001$ ), "getting asleep while watching TV" ( $r=-0.171$ ;  $p<0.05$ ), snoring( $r = -0.162$ ;  $p<0.05$ ). "Getting asleep at school" had mild negative correlation with Spanish language marks( $r = -$

0.192;  $p<0.001$ ), mathematics marks( $r = -0.117$ ;  $p<0.05$ ) and overall marks( $r = -0.117$ ;  $p<0.05$ ).

**Conclusions:** SDB mildly correlates with ADHD and mildly negative correlates with Spanish language academic performance. It seems that SDB could produce specific rather than whole learning deficits.

**P2363****Relationships between behaviour problems, current asthma severity and asthma onset in a population-based sample of children**

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**Background:** Several studies have found an association between childhood asthma and behaviour problems. However, the causal direction of this association is unclear.

**Objective:** In a population-based sample of children, we investigated, using referenced scales, the relationships between behaviour problems, current asthma severity and asthma onset.

**Methods:** 6880 children (8 to 13 years of age) were recruited in 6 French cities (6C Study). Behaviour problems were parentally reported through the Strengths and Difficulties Questionnaire. Children were classified as normal, borderline or abnormal. Asthma symptoms and onset were recorded with a standardised questionnaire. Severity of asthma was evaluated using the GINA guidelines. The associations between behaviour problems and asthma severity were assessed by an adjusted logistic proportional odds model and those between behaviour problems and asthma onset by a Cox survival model.

**Results:** Emotional symptoms and conduct problems were found to be related to asthma severity (OR = 1.51, 95% CI=1.25-1.83; OR = 1.46, 95% CI=1.19-1.78 respectively for abnormal versus normal children), and to early asthma onset (RR=1.60, 95% CI=1.27-2.01; OR = 1.34, 95% CI=1.05-1.70 respectively for abnormal versus normal children).

**Conclusions:** Our data drawn from a population-based sample of children indicate that internalizing problems (emotional symptoms) and externalizing problems (conduct problems) were associated with increased risk of current asthma severity and early asthma onset. Our findings suggest that behavioural adjustment difficulties in children may be taken into account in the management of asthma.

**P2364****Childhood allergic sensitisation and respiratory manifestations. 6C study-France**

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**Aims:** To estimate the relationship between allergic sensitisation and respiratory manifestations in a general population of children by using a standardised method.

**Methods:** In 6 cities, 7781 children entered a clinical protocol, including Skin Prick Tests (SPT) to common aeroallergens and run test for Exercise Induced Asthma (EIA). Parents filled a questionnaire. An enriched version of ISAAC II protocol was used.

**Results:** The prevalence of allergic sensitisation as defined by at least 1 positive SPT (mean wheal diameter >3 mm) varied significantly from 20.1% to 37.6%. The allergens were: 1) Indoors: HDM (17.0% for D.pter and 13.0% D.Far), cat 3.8%, cockroach 1.7%; 2) Outdoors: mixed grass 9.4%, trees pollens 3.8%; and 3) *Alternaria tenuis* 2.8%. Allergic sensitisation was differently related to the various respiratory outcomes (see table) with indoor allergens more related to asthma and outdoor allergens to allergic rhinitis (AR). *Alternaria* was associated also to rhinitis.

**Conclusions:** Allergic sensitisation is very widespread in childhood in France (1 child out of 3) and according to the type of allergen is differently related to asthma, rhinitis and EIA.

## Respiratory outcomes and allergic sensitisation

	Indoors	Outdoors	Alternaria
Lifetime asthma	4.1 (3.4-4.9)	2.9 (2.3-3.5)	2.5 (1.7-3.7)
Past year asthma	6.0 (4.9-7.3)	3.6 (2.8-4.5)	2.5 (1.6-3.9)
Lifetime AR	3.6 (3.1-4.1)	5.2 (4.4-6.2)	3.0 (2.2-4.2)
Past year AR	3.2 (2.7-3.8)	5.9 (4.9-7.2)	3.1 (2.1-4.6)
EIA	1.9 (1.6-2.4)	1.6 (1.3-2.1)	1.3 (0.8-2.2)

OR (95% CI).

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**P2365****A survey on the relationship between atopy and bronchial asthma among adolescents in the city of Guangzhou, China**H. Wang<sup>1</sup>, C. Zhang<sup>1</sup>, B. Sun<sup>1</sup>, N. Zhong<sup>1</sup>. <sup>1</sup>Allergy Department, Guangzhou Institute of Respiratory Diseases, Guangzhou, Guangdong, China**Objective:** To access the relationship between atopy and bronchial asthma in adolescents.**Methods:** A cross-sectional study was conducted. Cluster randomized subgroups of schoolchildren who had participated in ISAAC phase III survey in Guangzhou were enrolled from April to May, 2002. Skin prick test with 9 common aeroallergens was performed. The degree of atopy and the sensitivity of the allergen were graded by atopic index (AI) and skin index (SI), respectively.**Results:** Skin prick test was performed in 1187 subjects. 51.6% were males and the median of age was 13.8 years old. The prevalence of asthma was 9.4% and among those 81.1% was combined with having rhinitis and 24.3% having eczema. Asthma was more prevalent in patients with rhinitis (13.1%) or eczema (13.5%) than those without rhinitis(4.2%)(OR:3.444, 95% CI:2.110–5.622)or eczema(8.5%)(OR:1.676, 95% CI:1.055–2.663). The prevalence of atopy was 46.3% and the positive rates of house dust mite were the highest (about 45%). Atopy was more common in asthmatic patients (71.2%) than in those without any allergic diseases (26.4%)(OR: 6.812, 95% CI: 4.276–10.853). Asthma was more prevalent in patients with atopy (14.4%) than those without atopy (5.5%)(OR: 3.183, 95% CI: 2.075–4.883). The relative risk of having asthma was increased with the higher AI degree. Multivariate Logistic regression analysis showed that Der p(SI=3~4), *Alternaria tenuis* were the independent risk factors of asthma.**Conclusions:** Most of asthmatic adolescents were allergic to house dust mite in the city of Guangzhou. The risk of asthma was significantly positive correlated with the degree of atopy, as well as the sensitivity to Der p.**P2366****Bronchiolitis in infancy and transient wheezing after 3 yrs of follow-up**R. Grossi, M. Battaglia, G. Francesca, K. David, M. Corrado, R. Berardi, E. Arcadi, F. Mileto, E. Bonci, F. Scalercio, F. Midulla. *Pediatric, University of Rome "Sapienza", Rome, Italy*

Infants with bronchiolitis are at significantly increased risk for recurrent wheezing and childhood asthma. We wanted to evaluate the risk factors for recurrent wheezing at the age of 3yrs in a group of infants hospitalized for bronchiolitis from october 2003 to april 2004. 35 infants (mean age 3.8m, range 1–2m, 16 males) were enrolled in the study. On admission parents completed a questionnaire, with information about breast feeding, parent smoking habit, type of housing, family history of asthma and atopy. The diagnosis of Respiratory Syncytial Virus (RSV) infection was made from nasopharyngeal aspirates with a rapid immunoassay enzyme test. Parents of all infants were interviewed by telephone 12, 24 and 36 months after the acute episode of bronchiolitis about the recurrence of wheezing episodes in the child. Our results demonstrated that 62.9% of the infants were positive to RSV. The family history for asthma was higher in infants with RSV negative bronchiolitis compared to RSV positive bronchiolitis (46.2% vs 5.5%;  $p < 0.003$ ). After 36 months of follow-up a higher percentage of infants with RSV negative bronchiolitis presented episodes of wheezing compared to RSV positive infants (53.8% vs 27.3%;  $p < 0.05$ ). Factor analysis of our data have demonstrated that recurrent wheezing after 3 yrs of follow-up is positively associated with a family history for asthma and negatively associated with RSV isolation from nasal aspirates ( $p < 0.01$ ). The influence of family history in the development of recurrent wheezing after bronchiolitis should be clarified by genetic studies. Viral pathogens other than RSV that can cause bronchiolitis may contribute to the future development of recurrent wheezing.

**P2367****The prevalence of asthma and allergic diseases in working children**E. Cakir<sup>1</sup>, N. Varol<sup>2</sup>, Z.S. Uyan<sup>1</sup>, S. Oktem<sup>1</sup>, B. Karadag<sup>1</sup>, P. Ay<sup>3</sup>, R. Ersu<sup>1</sup>, F. Karakoc<sup>1</sup>, E. Dagli<sup>1</sup>. <sup>1</sup>*Pediatric Pulmonology, Marmara University Faculty of Medicine, Istanbul, Turkey;* <sup>2</sup>*Health Education, Marmara University, Istanbul, Turkey;* <sup>3</sup>*Public Health, Marmara University Faculty of Medicine, Istanbul, Turkey***Background:** Working children constitute a serious problem. Occupational exposures can lead to respiratory and allergic problems.**Objectives:** The aims were to determine the prevalence of allergic disorders and spirometric values in working children.**Methods and design:** The study was performed among children who worked at least 1 year. The data concerning allergic diseases was obtained through International study of asthma and allergies in childhood (ISAAC) questionnaires. Pulmonary function tests (PFT) were performed to all children.**Results:** Questionnaires and PFT were administered to a total of 802 children (436 working children and 366 control group), the mean age was  $16.77 \pm 1.17$  years. The prevalence of ever allergic rhinitis, rhinitis in last year and doctor-diagnosed rhinitis in working children and control group were found to be 18.6%-9.8% ( $p < 0.001$ ), 18.1%-8.5% ( $p < 0.001$ ), and 2.3%-2.7% ( $p > 0.05$ ) respectively. The prevalence of ever wheezing, wheezing in last year, doctor-diagnosed asthma and wheezing after exercise in working children and control group were found to be 14.0%-11.2% ( $p > 0.05$ ), 11.5% – 9.8% ( $p > 0.05$ ), 3.0%-2.7% ( $p > 0.05$ ) and 11%-6.6% ( $p = 0.02$ ), respectively. The prevalence of ever eczema, eczema in the

last year and doctor-diagnosed eczema in working children and control group were found to be 5.7%-2.7% ( $p = 0.03$ ), 4.1%-2.7% ( $p > 0.05$ ), and 3.2%-0.8% ( $p = 0.01$ ), respectively. FEV1, FEV1/FVC and PEF levels were lower in working children than control groups ( $p < 0.001$ ).

**Conclusions:** The prevalence of allergic diseases were significantly higher and pulmonary function tests were significantly lower in the working children. Working children should have a close follow up for allergic diseases and PFT.