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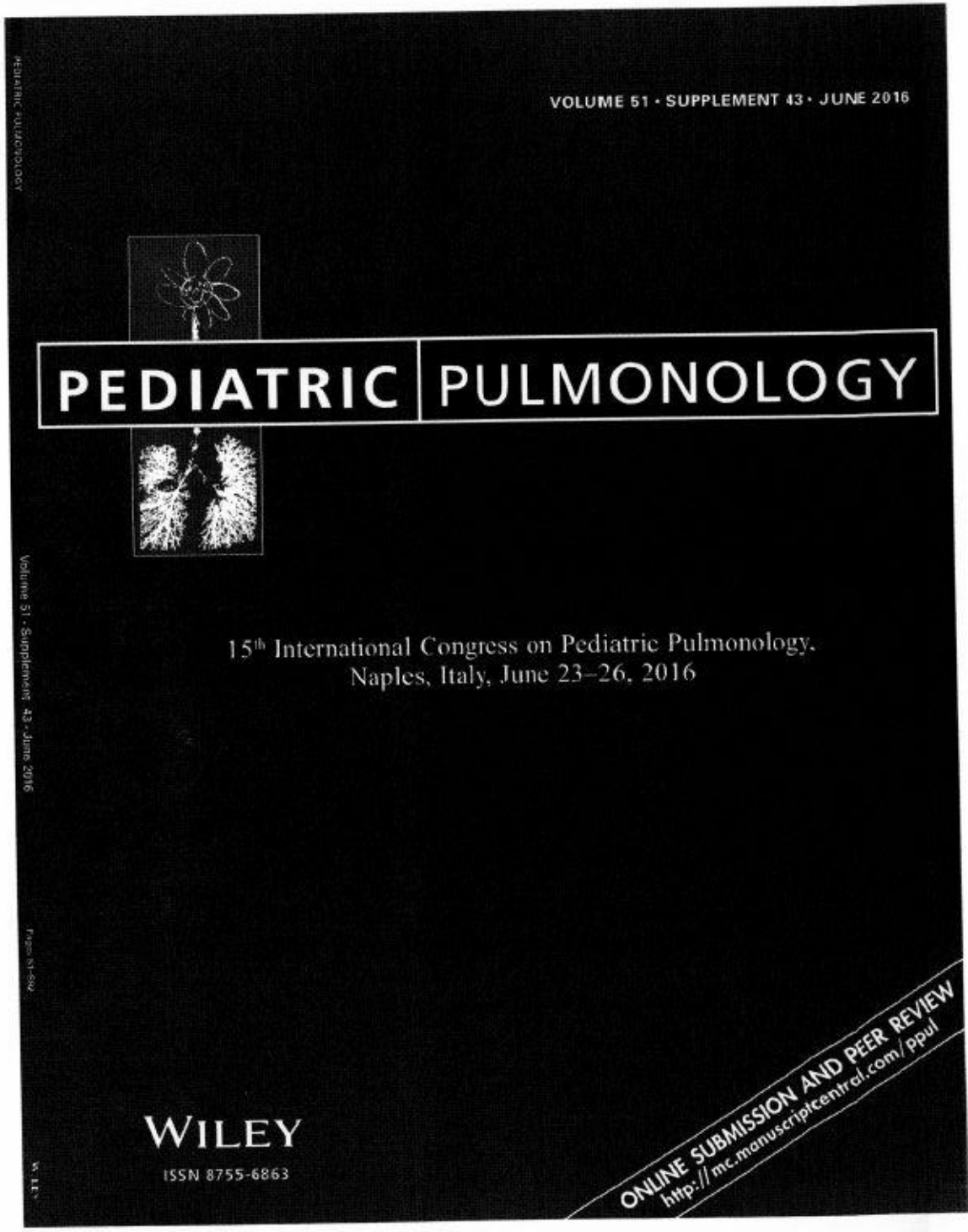

Pediatric Pulmonology Outpatient Clinic at the Clinic Hospital of the University of Campinas Medical School, in Brazil. A questionnaire was administered regarding the children's personal and family background, clinical manifestations and laboratory investigations. In addition, their parents were asked regarding how controlled were the crises of wheezing in the past four weeks and three months. On the same day, a 2 ml sample of blood was collected to measure the 25(OH) D serum level. A vitD deficiency was considered when lower than 20 ng/ml, insufficiency between 20 and 30 ng/ml and normal when higher than 30 ng/ml. In order to correlate with the vitD levels, questions were drawn with regard to sun exposure and the use or not of sunscreen. Chi-square, Fisher-Freeman-Halton and Mann-Whitney tests were used for statistical analysis ($p < 0.05$).

Results: In total, 92 patients were interviewed, 12 were excluded because of unsuccessful sampling. Out of the remaining 80 patients, 67.5% were male. The mean age in months was 22.09 ± 11.30, with a median of 21.00 (5–48) months. In our study, 13 (16.3%) infants had a vitD deficiency, 36 (45.0%) had insufficient levels and 31 (38.8%) had a normal vitD level. During 2015, 67 (83.8%) blood samples were taken in autumn or winter and 13 (16.3%) in summer or spring, although no difference between the levels of vitD was observed when comparing seasons; hence, for this reason, the groups were not separated based on the seasons. There was no association between vitD levels and sun exposure when analyzing frequency and duration of sun exposure, the period of the day and if the child used sunscreen or not. Out of the 13 infants that had a vitD deficiency, 6 (46.2%) did not have sufficient sun light exposure. There was no association between the levels of vitD and wheezing episodes in the last four weeks. Results showed that 49 (61.3%) children had at least one wheezing episode in the last four weeks, 8 of whom (16.3%) had a vitD deficiency and 22 (44.9%) had an insufficient serum vitD level. With regard to atopy, 37 (46.3%) were classified as atopic and there was no statistical difference with vitD levels or with wheezing in the last four weeks. Of these atopic children, 12 (32.4%) had a normal serum vitD level and 24 (64.9%) presented wheezing episodes.

Conclusion: In the present study, there were no significant impacts between vitamin D serum levels and the factors related to recurrent wheezing, such as gender, ethnicity and atopy. There was also no influence of seasons, sun exposure and use of sunscreen on vitamin D levels.

#A81 - LONG-TERM OUTCOME OF BRONCHODILATOR-RESISTANT AIRWAY LIMITATION IN SEVERE CHILDHOOD ASTHMA

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Background: Persistent airflow limitation in asthma may be an early sign of ACOS (Asthma COPD Overlap Syndrome). Epidemiological studies have shown that there may be a loss in lung function by the age of 14 years in children with severe asthma, but the loss did not progress into adult life (1).

Aim: To determine the outcome profiles and determinants of "bronchodilator-resistant" airway limitation from the age of 7 years to 18 years in severe asthma (ATS/ERS criteria).

Material & Methods: This retrospective study was conducted in 2 tertiary-care University Hospitals (1/1/2014 to 6/30/2014). Patients with severe asthma were identified via a computer-based patient registry. Patients with an associated disorder and/or premature infants were excluded. Non-reversible (NR) bronchial obstruction was defined according to the following (>1 criteria): post-salbutamol (400 µg) FEV1 z-score < -1.96, and/or FEF25-75 < -1.64, identified in at least 2 LFT (VMAX Sensormedics plethysmograph) performed at least 3 months apart. Data collected included standard demographic, allergy, asthma phenotype, LFT and treatment data. A chi2 (Yates correction) or ANOVA (Bonferroni correction) test was used as appropriate. A p-value < 0.05 was considered significant.

Results: 31 patients were included in the study (male sex, 73 %; familial /personal atopy, 63 %; ever admitted for acute asthma: 40 %). We identified 3 severe asthma groups according to LFT profiles throughout the entire childhood period: Normal LFTs (N, n = 10), Intermittent NR Airway Limitation (INRAL, n = 13), Permanent NR Airway Limitation (PNRAL, n = 8). Compared to the "N" group, "INRAL" patients had greater cumulative doses of inhaled steroids (58639 vs. 5558 µg beclomethasone eq., $p < 0.05$) (there was a trend towards early-onset persistent wheeze (<3 yrs), elevated blood eosinophils and IgE, more hospital admissions for asthma, more frequent montelukast administration). In the "PNRAL" group, there was a trend towards lower BMI, less atopy, later onset asthma (>3 yrs), longer duration of therapy by montelukast).

Conclusion: Some children with early-onset persistent "bronchodilator-resistant" airway limitation (INRAL) may improve with prolonged treatment. The identification of the determinants of such improvement requires further studies.

References: 1. Phelan PD, Robertson CF, Olinsky A. The Melbourne Asthma Study: 1964–1999. J Allergy Clin Immunol. 2002;109(2):189–94.

#A85 - ASSOCIATION OF TUMOR NECROSIS FACTOR-α AND TRANSFORMING GROWTH FACTOR-β1 LEVELS WITH PULMONARY FUNCTION TEST IN CHILDREN WITH BRONCHIAL ASTHMA

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The aim was to study the relationship between tumor necrosis factor-α (TNF-α), transforming growth factor-β1 (TGF-β1) levels in blood and pulmonary function test (PFT) parameters in children with bronchial asthma (BA).

Methods: 124 children aged 5–17 years with BA were examined, of which 37 had intermittent BA (1st group), 46 – mild persistent asthma (2nd group) and 41 – moderate or severe persistent stage of BA (3rd group). Twenty-seven healthy children were included in a control group. Levels of TNF-α and TGF-β1 in blood serum were measured by enzyme-linked immunosorbent assay. PFT was performed according to ATS/ERS Recommendations (forced expiratory volume (FEV1), vital capacity (VC)), respiratory resistance by forced oscillation (Rfo). Statistical analysis was performed with StatSoft Statistica Version 8.0.

Results: In BA exacerbation periods, TNF-α levels were significantly increased in the patients of 1st, 2nd and 3rd groups, compared with the control group ((109.52 (87.06; 126.45), 96.62 (83.52; 109.52) and 100.43 (77.89; 117.79) pg/ml compared with 23.55 (15.12; 31.05) pg/ml, respectively) ($P<0.001$).There were no differences in TNF-α levels in BA patients of the different groups ($P > 0.05$). TGF-β1 levels were significantly elevated in patients of 1st, 2nd and 3rd groups, compared with controls ((532.2 (341.9; 920.7), (1111.3 (705.2; 2374.2) and (590.5 (498.1; 942.7) pg/ml compared with 307.8 (268.8; 339.7) pg/ml, respectively) ($p = 0.001$).TGF-β1 level in 2nd group patients was significantly higher compared with the 1st ($p = 0.0006$) and 3rd groups ($p = 0.00124$). Multiple linear regression analysis showed TNF-α level in patients with BA in exacerbation was associated with FEV1, VC and Rfo ($p < 0.05$). There were no associations between TGF-β1 level and PFT parameters.

In BA remission, TNF-α levels were significantly increased in patients of all groups, compared with the control group. TGF-β1 levels were also significantly elevated in children of all groups, compared with controls. TGF-β1 level in 3rd group patients was significantly higher than in patients of the 1st and 2nd groups ($p = 0.0086$ and $p = 0.0489$, respectively). Multiple linear regression analysis demonstrated that TNF-α level in patients with BA in remission was also associated with PFT parameters. Rfo, VC, FEV1 were significant in multiple linear regression ($P < 0.001$) for TGF- β1 in patients with BA in remission.

Conclusions: TNF-α level does not depend on BA severity and is associated with PFT parameters in the period of exacerbation and in remission. The significant increase in TGF- β1 level in remission and emergence of associations of TGF- β1 level with PFT parameters in remission may reflect its role in airway remodeling in children suffering from severe asthma.

#A88 - MARKERS OF ENDOTHELIAL DYSFUNCTION IN CHILDREN WITH MILD PERSISTENT ASTHMA

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The aim of the study is to determine endothelial function in patients with mild persistent asthma during periods of exacerbation and remission.
Methods: 43 children aged 6 to 17 years with BA in exacerbation (1st group) and remission (2nd group) were examined. Seventeen healthy children composed the control group. Ultrasound assessment of endothelium-dependent dilatation of the brachial artery with evaluation of its diameter increase (FMD%) (D.S. Celermajer et al., 1992) was carried out. The serum levels of S-nitrosothiol were determined spectrophotometrically. Statistical analysis was performed with StatSoft STATISTICA Version 8 (Tulsa, OK). Non-parametric variables are expressed as median (interquartile range). The current clinical data study was approved by the Medical Ethics Committee of the Kharkiv National Medical University and conducted in accordance with the guidelines of the Declaration of Helsinki. All participants and their parents gave written informed consent.
Results: The indices of FMD% were significantly diminished in patients of the 1st and 2nd groups, compared with control: 8.42 (6.95; 15.00)% and 9.73 (8.42; 15.33)% respectively compared with 19.35 (17.00; 21.00)%, $p < 0{,}001$). A significant FMD% increase in remission compared to the period of exacerbation ($p1\text{-}2 = 0.0000$; $T = 0$) was revealed, but remained below the normative values ($pc\text{-}2 = 0.0000$). Serum S-nitrosothiol levels were significantly decreased in patients of the 1st and 2rd groups, compared with control: 0.21 (0.17; 0.26) and 0.27 (0.23; 0.33) mmol/l respectively compared with 0.33 (0.28; 0.37) mmol/l, $p < 0.001$). This index increased in the period of remission compared with the period of exacerbation ($p1\text{-}2 = 0.0000$, $T = 0$), but remained significantly lower than in children of the control group ($pc\text{-}2 = 0.0036$).
Relationship between FMD% and S-nitrosothiol in children with mild persistent asthma and disease duration was not revealed.
Conclusions: Presence of endothelial dysfunction in children with mild persistent bronchial asthma was determined both in the period of exacerbation and remission. It was demonstrated that these indices increase in dynamics although their values remain nevertheless lower than the norm. Results testify to the long term pathological process which leads to sustained alterations of vessel walls without regard to duration of the illness.

#A91 – PREVALENCE AND RISK FACTORS FOR BRONCHIAL ASTHMA IN SCHOOL-GOING CHILDREN OF SEMI-URBAN AREA OF INDIA

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Aims: To determine the prevalence of asthma in school-going children and identify the possible risk factors in semi-urban area.
Methods: The cross sectional study was conducted in randomly selected schools from semi-urban area. Minimal sample was ($n = 598$) assuming a prevalence of asthma of 15% with 95% level of confidence, 20% precision and 10% non-response rate. School-going children from 6th to 10th standard/grade were included in this study. Prior permission was received from school authorities. A modified International Study of Asthma and Allergy in Childhood (ISAAC) questionnaire was used and translated to local language Hindi. The questionnaire was back-translated to English and expert opinion was taken for validity and reproducibility for field use. The questions related to severity of asthma were excluded. Those who answered yes to any of the questions were identified as cases of asthma and others were identified as control for the purpose of this study. A semi-structured proforma was introduced to elicit information regarding risk factors. Age of the child was taken as completed years. Information regarding various risk factors including family history of asthma, type of fuel used, placement of kitchen in the house, number of windows in sleeping room, pet animals (cat and dogs), smoking among family members, birth order, and smoke outlet was collected.
Results: A total 620 subjects were analyzed with a response rate of 95%. The prevalence of bronchial asthma among study subjects was 20.3%. Mean age of study subjects was 12.98 (1.58) years. Male to female ratio was 1.59:1. Baseline characteristics including age, gender, weight and height were similar in both cases and controls (Table 1). Factors associated with presence of asthma were family history of asthma, smoking, pet animals and food allergy (Table 2). Factors such as cooking fuel, number of windows in sleeping room, location of kitchen and smoke outlet were not significant on statistical analysis.
Conclusion: Bronchial asthma is a significant problem in semi-urban areas of India. Family history of asthma, smoking, pet animals and food allergy are significant factors for the presence of asthma.

#A100 - POTENTIAL RISK FACTORS OF BRONCHIAL ASTHMA DEVELOPMENT IN CHILDREN

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The aim of the study was to study the influence of perinatal data and comorbidity on the development of bronchial asthma (BA) in children.
Methods: We analyzed data (demographic and perinatal data, comorbidity) from 164 children who have had previous health care visits caused by wheeze or cough, current wheeze, and chronic cough (cough without colds or cough at night) at the age of 1 to 3 years. Among these, at the age of 5 to 6 years, 44 patients (1st group) had BA, 120 children (2nd group) – without asthma. Asthma diagnosis was confirmed based on GINA. The current study was approved by the Medical Ethics Committee of the Kharkiv National Medical University and conducted in accordance with the guidelines of the Declaration of Helsinki. The Fisher exact test was used to compare characteristics of children with and without the outcome. Odds ratio was calculated for assessment of risk factor significance.
Results: The relative number of boys in the 1st group was significantly higher than in the 2nd group (65.9% and 42.5%, $p < 0.01$). The complicated course of pregnancy was found in 79.5% of patients of the 1st group and 58.3% of children of the 2nd group ($p < 0.05$). Pathological first trimester of pregnancy was detected in 40.1% of cases in the 1st group, 17.5% in the 2nd group ($p < 0.01$). The incidence of children with early formula-feeding (who were on breastfeeding less than 6 months) was significantly higher in the 1st group (77.3%), compared with the 2nd group (45.0%) ($p < 0.001$). The incidence of allergic rhinitis in children was significantly higher in the 1st group (65.9%) compared to the 2nd group (5.8%) ($p < 0.001$). The occurrence of gastrointestinal disease among observed children was higher in the 1st group (20.5%) compared to 2nd group (5.8%) ($p < 0.01$).
Conclusion. The development of BA in preschool children who presented to primary care with recurrent wheeze or cough was associated with male sex (OR 2.61 [95%CI 1.27–5.38]; $p < 0.05$), complicated course of pregnancy (OR 2.78 [95%CI 1.23–6.29]; $p < 0.005$), first trimester pregnancy pathology (OR 3.26 [95%CI 1.52–7.00]; $p < 0.01$), early formula feeding (OR 4.16 [95%CI 1.88–9.17]; $p < 0.001$), allergic rhinitis (OR 31.21 [95% CI 11.65–83.62]; $p < 0.001$) and gastrointestinal disorders (OR 4.15 [95% CI 1.44–11.96]; $p < 0.001$).