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631 Respiratory impedance measured by forced oscillation technique in young healthy preschool children

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RATIONALE: Respiratory impedance measured by Forced oscillation technique (FOT) has been used instead of spirometry in young children. This study was aimed to evaluate respiratory impedance in healthy preschool children.

METHODS: 1,053 preschool children aged 3-4 years were screened with ISAAC questionnaire. 955 children were excluded due to having positive question for ISAAC questionnaire, family history of allergy, recent lower respiratory tract infection, and environmental tobacco smoke. Respiratory impedance (resistance and reactance) was measured using FOT method (MostGraph-02; Chest M.I., Co Ltd, Tokyo, Japan).

RESULTS: A total of 98 children were enrolled. 40 children (40.8%) were male. 90 from 98 children (91.8%) could perform the measurements with acceptable coefficient of variability. The mean (sd) of respiratory impedance parameters were respiratory resistance at 5Hz (R5): 12.62(2.33) cmH2O/L/s, respiratory resistance at 20Hz (R20): 10.16(1.93) cmH2O/L/s, R5:20: 2.46(0.77) cmH2O/L/s, reactance at 5 Hz(X5): -2.07(1.36) cmH2O/L/s, frequency of resonance (Fres): 12.5(4.47) cmH2O/L/s, and area of reactance (ALX): 12.65(12.16) kPa.L.1 Significant correlation between respiratory impedance (R5, R20, X5, Fres and ALX) has been demonstrated to be correlated with weight but not with height. There was no significant difference in respiratory impedance between male and female in age-matched and height-matched data.

CONCLUSIONS: Majority of young preschool children, aged 3-4 years, can performed FOT method. FOT could be used as a tool in diagnosis and monitoring of pulmonary disease.

632 Bronchodilator Responsiveness of FEF25%-75% As a Predictor for the Loss of Control in Childhood Asthma

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RATIONALE: Notwithstanding medication adjustment following Global Initiative for Asthma (GINA) recommendation, it is generally observed that a number of controlled asthmatic children cannot maintain their level. This study attempted to find the parameters of pulmonary function test as predictors of the future loss of control in this type of patients.

METHODS: 21 children with controlled asthma, age 6-12 years old, were recruited for prospective study. Baseline allergy testing results, comorbidities and steps of treatment were collected. Pulmonary function test using spirometry were performed. The 10-14 weeks follow-up visit was made without change in medication. At the follow-up visit, the levels of control in asthmatic individuals were evaluated according to standard of GINA by a well-trained pediatrician, who was blinded to pulmonary function test results. Medication compliance, smoking exposure and respiratory tract infection were also assessed.

RESULTS: 9 from 21 children (42%) could not sustain their asthma control. Asthmatic children who became uncontrolled had significantly higher percentage in bronchodilator responsiveness (BDR) of forced expiratory flow between 25% and 75% of vital capacity (FEF25%-75%)3, in comparison to the group with maintained asthma control (31.67 ± 14.71% vs. 14.87 ± 7.43%, p-value = 0.009). Cut point of >25% BDR in FEF25%-75% at baseline had 78% of sensitivity and 92% of specificity, and were thus able to distinguish loss-of-control from maintain-of-control group.

CONCLUSIONS: The percentage of bronchodilator reversibility of FEF25%-75% potentially plays its important role as a predictor for the loss of control in asthmatic children.

633 Eosinophil Counts and Asthma Severity in Children

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RATIONALE: Elevated peripheral eosinophil count has been associated to asthma exacerbations and its severity. The objective is to determine whether eosinophil count is higher in severe asthmatics of a tertiary care setting.

METHODS: This is a retrospective analysis of 1475 asthmatic patients; we excluded cases with other conditions that might interfere in total serum IgE levels and eosinophil counts, such as helminthiasis. Skin prick tests (SPT) with standardized extracts of 11 allergens, FDA Allergenics®, were obtained in 663 patients. Tests were considered positive if wheal diameter was ≥ 3mm. Total serum IgE was determined by chemiluminescence. Eosinophil counts were obtained by CBC. Asthma diagnosis and severity have been classified according to GINA 2015.

RESULTS: 891 (60.4%) were male, median age 5.6 years (0.2 – 20 years); 86.8% had allergic rhinitis, 8% atopic dermatitis and 20.7% allergic conjunctivitis. 12.4% had no allergy-related comorbidities. Asthma was considered mild in 555 (37.7%), moderate in 610 (41.3%) and severe in 310 (21.1%); 362 (54.6%) had positive skin prick tests, 89.8% to D. pteronyssinus. Eosinophil counts were similar in mild (median 304 cells/mm³), moderate (median 296 cells/mm³) and severe asthma (median 249 cells/mm³) groups (Kruskal-Wallis Anova p = 0.27). ROC curve was generated for total serum IgE and eosinophil counts >400 cells/mm³. The area under the curve was 0.66 (95% CI 0.62-0.70; p<0.01) and sensitivity was 70.3% and 1-specificity was 57.3%, for IgE = 186kU/L.

CONCLUSIONS: eosinophil counts did not correlate to asthma severity in this group, but there was an association between serum IgE and eosinophil counts.

634 Exhaled Nitric Oxide Concentration Measured By NO Breath® Correlate with Asthma Severity

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RATIONALE: Measurement of fraction of exhaled nitric oxide (FeNO) in the breath of asthma patient is non-invasive and useful method for assessing eosinophilic airway inflammation. However, it is known that results vary with the type of device used. The relationship between FeNO measured by NO breath® (Bedfont Scientific, Maidstone, UK) and asthma severity or asthma control is unknown.

METHODS: We included 128 consecutive asthmatics who were using inhaled corticosteroids. They underwent FeNO quantification (NO breath®). The GINA guideline 2015 was used to assess asthma control. Asthma severity was assessed according to the recommendations of “Proceedings of the ATS workshop on refractory asthma” (Am J Respir Crit Care Med 2000).

RESULTS: The mean FeNO value was 17.5 ppb in the well-controlled group (95% CI = 9.6 - 26.6) and 37.1 ppb in partly-controlled (95% CI = 36.5 - 53.5; p = 0.0037), and 88.8 ppb in the uncontrolled group (95% CI = 53.0 - 113.3; p = 0.0009). The mean FeNO value was 44.9 ppb in the refractory asthma group (95% CI = 50.0 - 71.1) and 27.6 ppb in the non-refractory asthma group (95% CI = 9.63 - 31.9; p = 0.0289).

CONCLUSIONS: Our results demonstrate that FeNO measured by NO breath® reflects asthma control and severity.