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Relationship between exhaled nitric oxide and small airway dysfunction with impulse oscillation system in children with asthma

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Background: Fractional exhaled nitric oxide (FeNO) is a maker of airway inflammation, and impedance of low frequency in impulse oscillometry (IOS) reflect the small airway obstruction. We investigated the association between IOS and FeNO level in well-controlled asthma patients.

Method: Fifty-eight well-controlled pediatric asthma patients (60.3% male), median age 8.27 years (range: 4.5–16.0 years), were enrolled. All subjects underwent FEV₁, FVC and FEF_{25–75%} with spirometry, resistnace and reactance at 5 Hz with IOS and FeNO measurement. Z-score of spirometry and IOS, and mean level of FeNO were used for correlation and regression analysis.

Results: FeNO was significantly associated with height ($P < 0.030$, $r = 0.285$) and age ($P = 0.023$, $r = 0.298$), but not with other demographic parameters. There was a statistically significant correlation between spirometry results and IOS variables. There

was no statistical correlation between FeNO level and spirometry or IOS variables. After adjusting for height, sex, atopic status and the use of ICS, FeNO level showed significant correlation to z-score of FEV₁/FVC ($P = 0.037$, adjusted $R^2=0.234$).

Conclusion: FeNO showed no statistically significant correlation with IOS variables, while it was correlated with z-score of FEV₁/FVC. Therefore, while FeNO fails to detect small airway obstruction, it is of value in indicating whole airway obstruction.

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TNF-alpha and IL-10 serum activity in patients with metabolik sitndrom depend on bronchial obstruction presence

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Background: Recent evidence suggests close obesity and arterial hypertension association. Both pathological states are characterized by low-grade inflammation which result in adipokines dysfunction: increased activity of proinflammatory cytokines, such as tumor necrosis factor – α (TNF- α), interleukin-6 (IL-6) and decreased activity of anti-inflammatory cytokines – interleukin-10 (IL-10).

Method: Fifty-five Patients with arterial hypertension (AH) were examined. Serum TNF- α and IL-10 levels by ELISA were detected. All patients underwent anthropometry and spirometry. Patients were divided into 3 group depend on body mass and FEV1 means: 1 gr. – hypertensives with normal body mass; 2nd gr. – obesity-related hypertensives without bronchial obstruction (FEV1 >80%); 3rd gr. – obesity-related hypertensives with bronchial obstruction (FEV1 <80%).

Results: Serum TNF- α (1st gr. – 3.32 ± 1.3 pg/ml, 2nd gr. 6.37 ± 0.6 pg/ml, 3rd gr. – 13.78 ± 4.1 pg/ml; $P < 0.05$ in all cases) levels increasing were found in relation to obesity and bronchial obstruction development. IL-10 serum levels decreased depend on obesity progression to attain minimum means in AH patients with obesity and bronchial obstruction syndrome (1st gr. – 9.25 ± 1.8 pg/ml, 2nd gr. – 6.57 ± 0.5 pg/ml, 3rd gr. – 4.05 ± 0.9 pg/ml; $P < 0.05$ in all cases).

Conclusion: Obtained data demonstrate TNF- α levels elevation and IL-10 levels reduction with maximum changes in obesity-associated arterial hypertension with obstructive disorders of external breathing function. Our results suggest possibility of TNF- α and IL-10 involving to obstructive type of ventilation disorders development in the patients with AH and obesity.