1977

Impulse oscillometry: an alternative method to conventional spirometry in asthmatic children

Batmaz, SB[1] ; Arikoglu, T[1] ; Kuyucu, S[1]

[1]Mersin University Faculty of Medicine, Mersin, Turkey

Background: Pulmonary function tests are important in the diagnosis and follow-up of asthmatic patients. For children who can not perform forced respiratory maneuvers, impulse oscillometry (IOS) applied during spontaneous breathing might be an alternative method. In IOS, pressure waves that come out of a speaker are applied during tidal breathing, and respiratory impedence, which is formed by resistance and reactance, is calculated. This study aims to investigate the relationship between IOS and spirometry.

Method: 142 asthmatic children in remission or during an attack and 103 healthy control subjects (6–17 years) performed IOS and spirometry before and after salbutamol inhalation. IOS parameters (airway impedence (Z5), resistance at 5–35 Hz (R5–35), reactance at 5–35 Hz (X5–35), the difference between R5–R20 (R5–R20), resonant frequency (Fres) and reactance area (AX) and standart parameters for spirometry were used. The correlation between raw values for IOS and predicted percentage of spirometry values were detected. To differentiate asthmatic and healthy control groups IOS baseline and reversibility values' discriminating performances were evaluated. When spirometry was accepted as the gold standart test, the discriminating performance for IOS parameters for airway obstruction and reversibility were investigated.

Results: Z5, R5–35, X5, AX values of IOS were the most correlated parameters to spirometry. In asthmatic children, the mean values of Z5,R5,R10,R15,R20,R25,R35, X5,X10,X35; DAX, DX20 were statistically different than the control group. AX showed the best discriminating performance (sensitivity: 75.4; specificty: 98.1) to discriminate asthmatics from healthy children. Patients with obstruction detected by spirometry were also detected by AX,R5-R20; patients with reversibility were detected by DAX (cut-off ≤ 39.05).

Conclusion: IOS, of which values are correlated with spirometry, and which can discriminate asthmatic children from healthy controls, is an alternative method for spirometry in the diagnosis and treatment of asthma, especially in preschool children.