9 Paediatrics
9.2 Paediatric asthma and rhinitis

How body mass index may influence the diagnosis of asthma by impulse oscillometry.

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Abstract [maximum 2500characters with spaces]:

Background: Lung function assessment is a very important phase in the diagnosis and monitoring of airway diseases. The impulse oscillometry system (IOS) is a versatile non-invasive tool that may be used for lung function evaluation requiring minimal effort from the patient, thus being particularly useful in assessing young children that are unable to correctly perform spirometry. Transient IOS reference values for children aged 3 to 18 years old have already been published in previous studies and are known to be influenced by age and height. Since obesity and dyspnoea are often associated, the aim of this pilot study was to investigate how the body mass index (BMI) in children may influence the IOS parameters in lung function assessment. Moreover, the study also focused on how BMI affected the variation of IOS parameters after administration of a bronchodilator.

Method: IOS with bronchodilation test (400 µg Salbutamol) was performed in 141 children (64 girls), aged between 3 and 18 years old (9.1 ±4.2 years),using a MS-IOS MasterScreen, Jaeger, Cardinal Health, Germany, according to international recommendations. BMI was calculated and children were regarded as “normal weight” (61%), “overweight” (22%) and “obese” (17%), according to the BMI percentiles.

Results: There were no statistically significant correlations between BMI percentiles and the measured IOS parameters. However, there were statistically significant differences between the four groups of children when considering the variations of impedance (ΔZ) and reactance (ΔX) at 5Hz after administration of the bronchodilator (p=0.022 and p=0.003, respectively). These variations were significantly higher in the obese group (ΔZ= -2.4 [95% CI -3.5 : -1.3]; ΔX= 1.0 [95% CI 0.5 : 1.5]) when compared to overweight (ΔZ= -1.5 [95% CI -2.1 : -0.9]; ΔX= 0.3 [95% CI -0.1 : 0.7]) and normal weight (ΔZ= -1.5 [95% CI -1.7 : -1.2]; ΔX= 0.4 [95% CI 0.2 : 0.6]) groups.

Conclusion: There appears to be no associations between BMI percentiles and abnormal IOS parameters. Nevertheless, BMI percentiles appear to influence the Z and X at 5Hz parameter variations after the administration of 400µg of salbutamol suggesting that different responses to the bronchodilator may be associated with the BMI. The highest ΔZ and ΔX were observed in obese children.