

# ANALYSIS OF THE RESPIRATORY PATTERN AND THORACOABDOMINAL MOTION PATTERN AT REST AND AFTER SUB-MAXIMUM EFFORT IN ASTHMATIC CHILDREN

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## Abstract

**Introduction:** Asthma involves an increase in airway resistance even in periods between attacks, which generates changes in thoracoabdominal kinematics as well as adaptations of the respiratory dynamics that are intensified during physical exertion. The aim of the present study was to detect these adaptations at rest and after physical effort. **Methods:** A cross-sectional study was conducted. Evaluations were performed using optoelectronic plethysmography at rest and immediately after physical effort of moderate intensity. **Results:** Thirty-two children and adolescents participated in the present study. Mean age was  $8.9 \pm 2.4$  years in the asthmatic group (AG) and  $10 \pm 3.9$  in the healthy control group (CG). Significant intergroup differences ( $p < 0.05$ ) were found regarding FEV1 (%) ( $84.8 \pm 10.2$  in the AG and  $104.4 \pm 20.1$  in the CG). After exercise, the AG exhibited a smaller change in minute volume (3.4 vs. 4.9 liters) as well as a smaller change in tidal volume (66 vs. 153 ml), and a smaller change in respiratory rate (2 vs. 6). Opposite kinematic behavior was found; the contribution of the thoracic compartment was greater at rest and was reduced after effort in the AG, whereas the contribution of the abdominal compartment was greater at rest and was reduced after effort in the CG. Expiratory time was greater in the AG than the CG at both evaluation times. **Conclusion:** The kinematic behavior of thoracoabdominal motion was the inverse of that found in healthy controls. These findings suggest mechanical and physiological adaptations to minimize the possible swirling of the airflow and reduce the impact of airway resistance during physical exertion. Moreover, these changes are found even at rest and in patients whose asthma is clinically controlled.

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### Short Title/running head- THORACOABDOMINAL MOTION PATTERN IN ASTHMATIC CHILDREN

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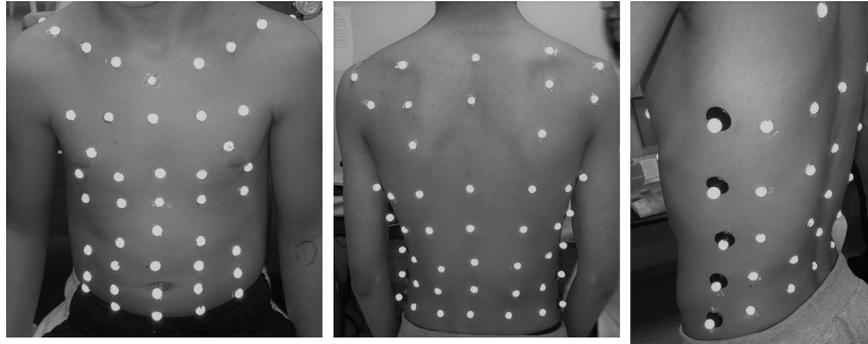
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The authors declare no Conflict of interest

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