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| **Intra-breath oscillometry impedance trajectories differ with wheeze status in preschoolers.** |
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| **Introduction/Aim:** Longitudinal intra-breath oscillometry (IB-OSC) may distinguish abnormal lung function trajectories in preschool children with a history of wheezing.  **Methods:** Children 3-7 years old from a prospective, longitudinal, community-based cohort performed annual IB-OSC using a single 10 Hz sinusoid while clinically asymptomatic. Linear mixed-effects models were developed to explore the effects of wheezing phenotypes, growth, and sex on seven IB-OSC outcome variables over time: resistance at end-expiration (ReE), resistance at end-inspiration (ReI), the tidal change in resistance (∆R=ReE-ReI), reactance at end-expiration (XeE), reactance at end-inspiration (XeI), the tidal change in reactance (∆X=XeE-XeI), and ∆X normalised by tidal volume (∆X/VT).   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Table 1. Association of height and wheezing history with intra-breath impedance (n=375 observations) | | | | | |  |  | Mean difference (95%CI) | *p-*value | | ReE† | Ht (cm) | -0.088 (-0.100 to -0.076) | **<0.001** | | TWz§  PWz§ | +0.414 (-0.096 to +0.924)  +0.586 (-0.075 to +1.258) | 0.118  0.088 | | ReI† | Ht (cm) | -0.098 (-0.110 to -0.086) | **<0.001** | | TWz§  PWz§ | +0.249 (-0.179 to +0.676)  +0.412 (-0.140 to +0.965) | 0.261  0.151 | | ΔR† | Ht (cm) | +0.010 (+0.001 to +0.019) | **0.035** | | TWz§  PWz§ | +0.109 (-0.145 to +0.363)  +0.179 (-0.147 to +0.506) | 0.405  0.288 | | XeE† | Ht (cm) | +0.034 (+0.024 to +0.044) | **<0.001** | | TWz§  PWz§ | -0.245 (-0.580 to +0.090)  -0.669 (-1.102 to -0.237) | 0.159  **0.004** | | XeI† | Ht (cm) | +0.050 (+0.041 to +0.059) | **<0.001** | | TWz§  PWz§ | -0.006 (-0.248 to +0.236)  -0.222 (-0.534 to +0.090) | 0.962  0.170 | | ΔX† | Ht (cm) | -0.011 (-0.021 to 0.000) | **0.046** | | TWz§  PWz§ | -0.329 (-0.569 to -0.089)  -0.465 (-0.772 to -0.159) | **0.009**  **0.004** | |  | Ht (cm) | +0.078 (+0.050 to +0.107) | **<0.001** | | TWz§  PWz§ | +0.484 (-0.250 to +1.216)  +1.433 (+0.492 to +2.374) | 0.203  **0.004** | | † hPa∙s∙L-1; ‡ hPa∙s∙L-2; § Reference category is never wheezed group; Ht, height; PWz, persistent wheeze; TWz, transient wheeze. | | | | |   **Results:** 85 children produced 375 acceptable IB-OSC measurements and were categorised into three wheeze groups: never (n=36), transient (n=35), or persistent (n=14). After adjusting for height, children with persistent wheezing had worsening trajectories for XeE, ∆X, and ∆X/VT (Table 1). Height, but not sex, had a significant effect on all IB-OSC variables when adjusted for the effect of preschool wheezing.  **Conclusion:** IB-OSC reactance outcomes may allow abnormal lung function to be identified early in asymptomatic children with a history of persistent wheezing. **Grant Support:** NHMRC, Hungarian Scientific Research Fund, and ERS Clinical Research Collaboration Award. **Key Words:** children, intra-breath, oscillometry, preschool, wheeze. |