

# Free Communications: Abstract 6

## Predicting the effect of treatment in paediatric OSA by clinical examination and functional imaging

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**Introduction:** Obstructive sleep apnea (OSA) is the most severe manifestation of sleep-disordered breathing. OSA may affect up to 4% of the children in the general population. Untreated OSA is associated with significant comorbidities and therefore it needs to be correctly treated. Although enlargement of the adenoids and/or tonsils is the main cause of OSA in children, OSA is a multifactorial condition. The role of other factors beyond adenotonsillar enlargement may explain the high incidence of residual OSA after adenotonsillectomy (ATE) (23-51%). Therefore, it seems worthwhile to identify anatomical abnormalities in an individual child to select the most appropriate treatment and minimize the risk of persisting OSA. Functional respiratory imaging (FRI) can give additional functional information about the upper airway. Studies on the clinical usefulness of FRI in children with OSA without underlying comorbidity are limited. Preliminary data in this study also showed that FRI could identify differences in the UA of children with residual OSA.

**Aim of the study:** The aim of this study was to investigate whether functional respiratory imaging (FRI) or clinical examination could predict treatment outcome for obstructive sleep apnea (OSA) in normal-weight, non-syndromic children.

**Methods:** Normal weight children diagnosed with OSA by polysomnography were prospectively included. All children got a thorough evaluation and an ultra-low dose computed tomography scan of the upper airway (UA). A 3-D reconstruction was built combined with computational fluid dynamics for FRI. Decisions on the need and type of surgery were based upon findings during drug-induced sleep endoscopy. A second polysomnography was performed 3-12 months after surgery.

**Results:** Ninety-one children were included: 62 boys, 5.0±2.7 years, BMI z-score of -0.1±1.2 and obstructive apnea/hypopnea index (oAHI) 2.1-124/hour. Children with more severe OSA had a smaller volume of the overlap region between the adenoids and tonsils. Nineteen out of 60 patients had persistent OSA (oAHI >2/hr). A lower conductance in the UA and a higher tonsil score predicted successful treatment.

**Conclusions:** A less constricted airway, as characterized by both FRI and a lower tonsil score, was associated with a less favorable response to (adeno)tonsillectomy. Further studies after treatment using FRI and DISE are warranted to further characterize the UA of these subjects.



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