

Inflammation and metabolic changes associated with obstructive sleep apnoea in Asian children.

Background: Changes in inflammatory cytokines and adipokines are described in obese children with obstructive sleep apnoea (OSA) but limited information is available in Asian children. We hypothesised OSA is associated with alterations in T lymphocyte and adipokines and aimed to define these changes according to OSA severity.

Method and Analysis: 64 children (37 obese) were recruited; 86% were boys with an average age of 11.9 years. Overnight polysomnography (PSG) was performed and patients were divided into three groups based on their PSG: control (apnea-hypopnea indices [AHI] < 1/h total sleep time [TST]), mild OSA ($1 \leq \text{AHI} < 5/\text{h TST}$), moderate-severe OSA ($\text{AHI} \geq 5/\text{h TST}$). Plasma samples of all of these children were assessed for inflammatory cytokines and adipokines using a bead-based multiplex immunoassay technique. Variance of the groups was statistically compared using one-way ANOVA, and significances ($p < 0.05$) were reported according to post-hoc and *a priori* analysis.

Results: Children with moderate-severe OSA were older [mean:13.14 years] and differed across the groups. Obesity was more prevalent in children with moderate-severe OSA [21.8%]. *a priori* analysis showed that both Ghrelin with $F(1,60) = 3.895, p = 0.05$ and Resistin with $F(1,60) = 3.850, p = 0.05$ was significantly regulated in these children. Interestingly, there were also significant differences in the T helper 2 (Th 2) related lymphocytes in this groups as IL-9 showed $F(1,60) = 8.242, P = 0.006$

and IL-13, $F(1,60) = 5.826$, $P = 0.019$. There was a strong, positive correlation between these two variables, $r = 0.549$, $n = 64$, $p < .0005$.

Conclusion: Adipokines could be considered as independent markers for the severity of OSA disease. This study also showed that severe OSA in paediatrics was associated towards Th2 predominance (IL-9 and IL-13). These associations suggest a priori involvement of complex sets of metabolic and inflammatory pathways in our Asian children with OSA.