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Title: Low morning serum cortisol levels in children with adenotonsillar hypertrophy and obstructive sleep apnea

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Body: Adenoidal and tonsillar tissue in children with obstructive sleep apnea (OSA) has enhanced expression of glucocorticoid receptors (Goldbart 2005). Although this finding suggests a favorable profile for topical steroid therapy in children with OSA, its pathogenetic role in adenotonsillar hypertrophy is unknown. It is possible that overexpression of glucocorticoid receptors in pharyngeal lymphoid tissue reflects low endogenous cortisol levels. We hypothesized that children with OSA and tonsillar hypertrophy have lower morning serum cortisol levels compared to healthy control subjects. Methods: Consecutive children with snoring and participants without snoring underwent polysomnography, grading of tonsillar size and measurement of morning serum cortisol. Results: Children with moderate-to-severe OSA (n=17; 6.1±2.2 yo; AHI 14.7±10.6 episodes/h) had significantly lower morning serum cortisol levels than subjects with mild OSA (n=14; 6.8±2.3 yo; AHI 2.6±1.2 episodes/h) or control participants without snoring (n=14; 6.5±2.5 yo; AHI 0.7±0.2 episodes/h): 16.9±8.7 vs. 23.3±4.2 or 22.3±5.3 mcg/dL; p<0.05. In contrast, children with moderate-to-severe OSA (n=13; 5.1±1.1 yo; AHI 11.1±5.6 episodes/h) had similar cortisol levels relative to subjects with mild OSA (n=13; 6.8±2.4 yo; AHI 2.4±1.2 episodes/h) or control participants without snoring: 25.6±8.1 vs. 20.2±11 or 22.3±5.3 mcg/dL; p>0.05. Conclusions: Low morning serum cortisol in children with OSA and tonsillar hypertrophy might be responsible for the enhanced expression of glucocorticoid levels in pharyngeal lymphoid tissue.