Title: **Severity of sleep apnea does not predict self-reported sleepiness in snoring adolescents**

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Objectives: Adolescents with obstructive sleep apnea (OSA) report more sleepiness than healthy controls on the Cleveland Adolescent Sleepiness Questionnaire (CASQ). Obstructive apnea-hypopnea index (O-AHI) does not accurately predict behavioral problems in younger children. The relationship between sleepiness and severity of sleep apnea in adolescents is largely unknown. The purpose of this study is to examine the predictive value of polysomnographic findings on sleepiness in adolescents.

Methods: 190 children ages 11-21, seen at the University of Rochester between 9/1/16-5/31/17, completed the CASQ, which assesses self-reported sleepiness (11 questions) and alertness (5 questions) using a 5 point Likert scale. The survey is scored such that total values are higher for sleepier patients. Polysomnography was obtained on 59 patients and scored using current American Academy of Sleep Medicine guidelines.

Results: Subjects presenting for sleep medicine evaluation (age=15.92$\pm$2.31, 94 males, CASQ=42.47$\pm$13.33) were sleepier ($p<0.05$) than a previously published normative sample (n=411, CASQ= 35.2±11.0, Spilsbury, 2007). Both subjects with OSA, defined as O-AHI$\geq$2 (n=34, O-AHI=8.73$\pm$9.56) and subjects with primary snoring (PS), defined as O-AHI<2 (n=25, O-AHI=0.92$\pm$0.49) were sleepier than the normative sample (OSA: CASQ=41.21$\pm$12.00, $p<0.05$, PS: CASQ=47.36$\pm$14.03, $p<0.05$). No statistical difference was found in the sleepiness of patients with OSA compared to those with PS (p=ns). No significant correlation was found between polysomnographic severity of sleep apnea (O-AHI) and sleepiness (total CASQ score). Limb movement arousal index (2.78$\pm$2.17 events/hour), sleep efficiency (83.64$\pm$10.15%), total sleep time (392.34$\pm$54.60 min), and wake after sleep onset (42.34$\pm$38.46 min), showed no correlation with CASQ score. However, a statistically significant ($p<0.05$) negative correlation was found between CASQ score and percent time spent in slow wave sleep (15.21$\pm$7.70%, r= -0.385), and a positive correlation was found between CASQ score and percent time spent in REM sleep (17.90$\pm$5.94 r=0.37; $p<0.05$).

Conclusion: These data demonstrate that patients with OSA are sleepier than their healthy counterparts. PS patients have sleepiness similar to those with OSA, highlighting the need for studies examining the efficacy of treatment for children who snore but who do not have polysomnographic evidence of sleep apnea. In addition, the severity of OSA as measured by O-AHI does not correlate with the self-reported sleepiness, suggesting that the frequency of sleep-related respiratory events does not directly measure the features of OSA that account for excessive sleepiness.

Spilsbury JC, Drotar D, Rosen CL, Redline S. The Cleveland Adolescent Sleepiness Questionnaire: A New Measure to Assess Excessive Daytime Sleepiness in Adolescents. *J Clin Sleep Med. 2007;3(6):*603-612.