

Attention deficit hyperactivity disorder and sleep disordered breathing in pediatric populations: A meta-analysis

A relationship between attention deficit hyperactivity disorder (ADHD) and sleep disordered breathing (SDB) in children and adolescents has been suggested by some authors. Yet, this topic remains highly controversial in the literature.

A meta-analysis was conducted in order to examine the extent of relationship between SDB and ADHD symptoms in pediatric populations and whether there are differences in ADHD symptoms pre- versus post-adenotonsillectomy in pediatric populations.

PubMed/Medline, PsychInfo and Cochrane databases were searched using the key words “attention deficit hyperactivity disorder” or “ADHD” and “obstructive sleep apnea” or “OSA” or “sleep disordered breathing” (SDB) or “SDB”. English language publications through September 2012 were surveyed. Meta-analysis was conducted to assess the relationship between SDB and ADHD symptoms in the first part of the study, and the extent of change in ADHD symptoms before and after adenotonsillectomy in the second part.

Eighteen studies satisfied the inclusion criteria for the first part of the study. This represented 1113 children in the clinical group (874 diagnosed with SDB who were examined for ADHD symptoms; 239 diagnosed with ADHD who were examined for SDB) and 1405 in the control-group. Findings indicate that there is a medium relationship between ADHD symptoms and SDB (Hedges' $g = 0.57$, 95% confidence interval: 0.36–0.78; $p = 0.000001$). A high apnea hypopnea index (AHI) cutoff was

associated with lower effect sizes, while child age, gender and body mass index did not moderate the relationship between SDB and ADHD. Study quality was associated with larger effect sizes. In the second part of the study, twelve studies were identified assessing pre- versus post-surgery ADHD symptoms. Hedges' g was 0.43 (95% confidence interval = 0.30–0.55; $p < 0.001$; $N = 529$) suggesting a medium effect, as adenotonsillectomy was associated with decreased ADHD symptoms at 2–13 months post-surgery.

The findings of this meta-analysis suggest that ADHD symptoms are related to SDB and improve after adenotonsillectomy. Therefore, patients with ADHD symptomatology should receive SDB screening. Treatment of comorbid SDB should be considered before medicating the ADHD symptoms if present.