

Better behavior after tonsil/adenoid surgery for kids with sleep breathing trouble?

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Children with obstructive sleep apnea who had a common surgery to remove their tonsils and adenoids showed notable improvements in behavior, quality of life and other symptoms compared to those treated with "watchful waiting" and supportive care, according to a new study.

However, surprisingly, there was no difference between both groups in the primary study outcome, attention and executive functioning, as measured by formal [neuropsychological tests](#). The research was published online today in the *New England Journal of Medicine*, in conjunction with a presentation at the [American Thoracic Society](#) annual meeting.

The study was conducted at seven hospitals outside Michigan, but University of Michigan Health System researchers helped design and lead it and are among the authors. Members of the U-M [Sleep Disorders Center](#), they have studied linkages between sleep apnea and behavior, cognition, and mental health for nearly two decades.

The Childhood Adenotonsillectomy Trial (CHAT) studied 464 [children](#), aged 5 to 9 years. It was the first [randomized clinical trial](#) of surgery for obstructive sleep apnea in children.

Ronald Chervin, M.D., M.S., a member of the Steering Committee for CHAT and a co-author on the new paper, notes that it was important to carry out a randomized, controlled trial to evaluate the impact of surgery. He notes that many studies have yielded promising evidence of

associations, but not necessarily cause-and-effect, between childhood sleep apnea and suspected effects on the brain.

"A number of researchers have shown that in children, disruptive daytime behavior is linked to abnormal breathing during sleep, or the overall quality and quantity of sleep," he notes. "The role of the tonsils and adenoids in interfering with breathing during a child's sleep, and the impact of removing them, becomes much clearer with these results."

Obstructive sleep apnea, or OSA, is a condition of interrupted sleep and breathing caused by a narrowing in the throat or upper airway that worsens during sleep. The narrowing can result from enlarged tonsils and adenoids, obesity or other medical problems. Occurring in both adults and children, it has a higher prevalence in African-American and obese patients.

Adenotonsillectomy, the surgical removal of tonsils and adenoids, is the primary treatment for OSA in children. Over half a million U.S. children undergo the procedure annually. The study randomized 464 children to either receive surgery or watchful waiting with supportive care from 2007 to 2011. Nearly half the children were overweight or obese. All underwent a sleep study at an outpatient sleep center at baseline and after seven months of treatment. The study did not include patients with the most severe [sleep apnea](#).

The primary outcome of the CHAT trial was the Attention/Executive Function Domain score in a formal test, the Developmental Neuropsychological Assessment, administered by licensed psychometricians. The study found no significant difference between the treatment groups in these test results.

The secondary outcomes included ratings from parents and teachers who completed questionnaires rating a child's behavior, sleepiness, quality of

life, and executive functioning, including details about activities of daily living. For instance, adults rated the degree to which a child kept up with tasks, seemed to have hyperactive behavior, had angry outbursts or mood changes, got along with other children, planned ahead, worried frequently, or had trouble sleeping.

The children who had surgery had significantly greater improvements, compared to children in the watchful waiting group, in the secondary outcomes listed above. U-M's Bruno Giordani, PhD, who led a Neuropsychology Core for CHAT, noted that these benefits from surgery are not likely to have emerged solely due to parental expectations, as parents' ratings were consistent with those from the teachers.

Overall, both surgery and watchful waiting were safe in this clinical trial, according to U-M's Susan Garetz, M.D., who led a group of ear, nose, and throat surgeons who assisted with CHAT. Garetz interprets these results to mean that watchful waiting is a reasonable option for parents of some children with less severe OSAS who opt not to have surgery. However, clinicians should carefully monitor these children to ensure their condition does not worsen.

The CHAT trial, says Chervin, left many questions for further research. One in particular, he says, is whether OSA is definitely the cause for behavioral problems that children with OSA often experience. This is because the CHAT study only included children who had OSA. Furthermore, the severity of OSA did not predict the behavioral outcomes.

"Sleep medicine is a very new field, with many unanswered questions," concludes the study's first author, Carole L. Marcus, M.D., a sleep specialist and director of the Sleep Center at The Children's Hospital of Philadelphia. "For instance, we go to sleep each night, yet we don't even

know truly understand the true purpose of [sleep](#). But this study is a great first step in finding some of the answers."

More information: Marcus et al, "A Randomized Trial of Adenotonsillectomy for Childhood Sleep Apnea," *New England Journal of Medicine*, published online May 21, 2013.

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