

Tonsillectomy May Worsen Long-term Health Outcomes

Pam Harrison

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People who have their tonsils or adenoids removed before age 9 years are at higher risk for respiratory, infectious, and allergic diseases up to the age of 30 years, a population-based study of almost 1.2 million patients suggests.

"We found that tonsillectomy was associated with a nearly tripled risk of upper respiratory tract diseases, and that adenoidectomy was associated with doubled risk of [chronic obstructive pulmonary disease] and upper respiratory tract diseases and nearly doubled risk of conjunctivitis," Sean Byars, PhD, from the University of Melbourne in Victoria, Australia, and colleagues write.

"Physicians often remove adenoids and tonsils to treat recurrent tonsillitis or middle ear infections," they add.

"Understanding the longer-term impact of these surgeries is critical because the adenoids and tonsils are parts of the immune system, have known roles in pathogen detection and defense, and are usually removed at ages when the development of the immune system is sensitive."

Byars and colleagues say the findings should prompt renewed efforts to identify nonsurgical alternatives for treatment. However, at least one expert says the results should be interpreted with caution because of the study design and because the underlying cause for the original surgery can have negative effects of its own.

The study was [published online](#) June 7 in *JAMA Otolaryngology–Head & Neck Surgery*.

Byars and colleagues analyzed data from the Danish Birth Registry, which included 1,189,061 individuals for health outcomes through age 30 years. Participants included in the analysis were born between 1979 and 1999 and were followed until 2009. Some 17,460 participants had had their adenoids removed, 11,830 had had their tonsils removed and 31,377 underwent an adenotonsillectomy. The remaining participants in the sample served as controls.

When the investigators calculated the long-term risks of 28 different diseases among each group, they found that tonsillectomy was associated with nearly a threefold relative risk (RR) of diseases of the upper respiratory tract (RR, 2.72; 95% confidence interval [CI], 1.54 - 4.80) compared with children who had not had their tonsils removed.

This translated into a number needed to treat (NNT) of only 5, "suggesting that only about 5 tonsillectomies would need to be performed for an additional upper respiratory tract disease to be associated with one of those patients," the authors explain.

Adenoidectomy, in turn, was associated with a greater than twofold risk for chronic obstructive pulmonary disease (RR, 2.11; 95% CI, 1.53 - 2.92) and a nearly twofold increase for respiratory tract diseases (RR, 1.99; 95% CI, 1.51 - 2.63) and conjunctivitis (RR, 1.75; 95% CI, 1.35 - 2.26). This translated into a NNT of 9 for upper respiratory tract diseases, 349 for chronic obstructive pulmonary disease, and 624 for conjunctivitis.

"For some diseases, even modest increases in relative risk (RR, 1.17-1.65) resulted in relatively large increases in absolute risk (2%-9%) and low NNTs (NNT-harm <50) because of the high prevalence of these diseases in the population," the researchers explain. The increased risk of these diseases were largely respiratory in nature, including asthma and pneumonia, they add.

Furthermore, when investigators analyzed all 28 disease groups, "there were small but significant increases in [RR] for 78% of them," the investigators state. For example, the RR for otitis media also increased 2- to 5-fold, whereas the risk for sinusitis after adenotonsillectomy increased by 68% (RR, 1.68; 95% CI, 1.32 - 2.14).

However, surgical removal of the tonsils and the adenoids was not unilaterally associated with increases in worse health outcomes. Adenoidectomy, for example, reduced the relative risk for sleep disorders by 70% (RR, 0.30; 95% CI, 0.15 - 0.60). Not surprisingly, both surgeries significantly reduced the risk for tonsillitis and chronic tonsillitis by approximately 50% to 90% (RR, 0.09 - 0.54).

Best Available Evidence

Asked by *Medscape Medical News* to comment on the findings, Richard Rosenfeld, MD, MPH, distinguished professor of otolaryngology at SUNY Downstate Medical Center in Brooklyn, New York, acknowledged that evidence-based medicine means making clinical decisions using the best evidence available. Often, the "best" evidence is an observational study.

"All decisions, however, must take into account our confidence (trust) in study results, which for some observational studies is

low," Rosenfeld cautioned.

In this study, for example, Rosenfeld, who authored an [editorial](#) that accompanies the study, points out that there are multiple potential sources of bias including confounding variables such as smoke exposure, which was not controlled for; reverse causation, wherein children with asthma, allergies, and frequent respiratory infections may have been more likely to see specialists, and thus their conditions led to the surgeries rather than the other way around; and selection bias, in which it was not known how patients were chosen for surgery, and thus results are not generalizable outside of the study sample.

"[These biases] could distort the findings both in terms of magnitude and significance," Rosenfeld told *Medscape Medical News*, "and we cannot simply ignore these. We must view the results as provocative, not definitive."

Rosenfeld also notes that the two primary indications for tonsillectomy (with or without adenoidectomy) are obstructive sleep apnea syndrome (OSAS) and recurrent throat infection. "For OSAS, I would not let the current study's findings influence decision-making, because OSAS can have significant cognitive, physical, and developmental sequelae in children," Rosenfeld said.

In contrast, surgery for recurrent throat infection is always elective, rarely leading to any serious consequence if deferred, and children may improve on their own, he added. As such, this study might prompt families considering tonsillectomy for recurrent throat infection to hold off on the surgery. "What I would tell parents is that there is a single study suggesting some possible relationship of tonsillectomy/adenoidectomy with future respiratory, infectious or allergic conditions but results are preliminary because of limitations in how the study was done," Rosenfeld advised.

"But if the indication for surgery was OSAS, I would not let this sway decision-making," he reemphasized.

The authors and Rosenfeld have disclosed no relevant financial relationships.

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