Are Antibiotics Indicated for Acute Sinusitis?

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BACKGROUND
Acute rhinosinusitis is a very common illness that is associated with physical, functional, and emotional impairments and significant treatment costs. Rhinosinusitis is defined as symptomatic inflammation of the sinuses and nasal cavity. Acute rhinosinusitis is classified as illness or symptoms for <4 weeks. It is typically a self-limiting disease; however, there are potential rare serious complications of acute infection, including meningitis, orbital infection, and brain abscesses. Due to increasing concerns with antibiotic resistance, and the common confusion of viral rhinosinusitis with bacterial infection, it is important to consider the indications of antibiotic treatment for acute rhinosinusitis. Currently, antibiotics are prescribed very frequently in patients with acute sinusitis; acute rhinosinusitis is the fifth most common condition for which an antibiotic is prescribed in the United States. The management of acute rhinosinusitis in adults has been a controversial topic for many years due to questions about overprescribing of antibiotics as well as inappropriate radiographic imaging and testing.

LITERATURE REVIEW
In 2007, The American Academy of Otolaryngology (AAO) published guidelines to provide evidence-based recommendations on the management of sinusitis. First, the guidelines strongly recommend that acute bacterial sinusitis be differentiated from acute viral sinusitis to avoid the use of antibiotics. Signs and physical symptoms consistent with acute bacterial infection include purulent drainage, nasal obstruction, facial pain/fullness, and persistent symptoms for more than 10 days or worsening after initial improvement. The AAO guidelines suggested that watchful waiting for acute bacterial rhinosinusitis is an option for patients with uncomplicated or nonsevere illness at presentation. This recommendation is supported by randomized controlled trials in which there was a high likelihood of spontaneous improvement in patients receiving placebo treatment. Additionally, adverse effects of treatment were reported at higher rates in the antibiotic treatment groups than in the placebo groups in these studies.

Since 2007, multiple studies have looked into this controversy further. In 2012, a randomized, placebo-controlled trial was conducted to determine the additional effect of amoxicillin treatment over symptomatic treatment of adults in primary care offices diagnosed with uncomplicated acute rhinosinusitis. Patients were given either a 10-day course of amoxicillin or placebo treatment. Additionally, all patients were given symptomatic treatment for pain, fever, cough, and nasal congestion. The primary outcome was improvement in disease-specific quality of life after 3 to 4 days of treatment. Effects of treatment at longer time intervals were not considered primary outcomes, as there is a known high probability of spontaneous resolution of symptoms in acute rhinosinusitis at longer time intervals. Disease-specific quality-of-life measures were used to assess symptom changes at day 3, 7, and 10 of treatment. According to these measures, patient-reported symptoms were not significantly different in the two treatment groups at 3- and 10-day intervals, although there was a statistically significant improvement in the symptom of nasal obstruction in the amoxicillin group at day 7. This study supports the American Academy of Otolaryngology–Head and Neck Surgery recommendations to treat uncomplicated acute sinusitis with a method of watchful waiting and to consider avoiding an antibiotic prescription.

A Cochrane meta-analysis review of the literature, published in 2012, attempted to assess the effect of antibiotics in adults with rhinosinusitis. Placebo-controlled, randomized, controlled trials of antibiotics for rhinosinusitis-like complaints were identified and included in the analysis. Most of these studies limited recruitment to patients seeking care from primary care physicians and excluded patients who were referred to otolaryngology specialists. The odds ratio (OR) for the effect of antibiotics as compared to placebo treatment was 1.25 (95% confidence interval [CI]: 1.02–1.53). The number needed to treat to benefit and shorten the time to cure was calculated as 18. An analysis of adverse events was included.
in some of the studies, and these data were pooled. Adverse effects included gastrointestinal complaints, rash, fatigue, and headache. Of the participants who reported side effects from medication, 27% had received antibiotic treatment, and 15% had received placebo treatment (OR: 2.10, 95% CI: 1.60-2.77) (Fig. 1). This review showed that antibiotics were found to shorten the time to cure, but only five more patients per 100 would be expected to experience symptom relief faster if they were prescribed antibiotics. The authors concluded that the benefits of antibiotics appear to be small, and when the adverse effects of medication are considered, the utility of antibiotics may be minimal. The results of this review should be interpreted in light of the very low complication rate from untreated acute sinusitis and an increasing concern for antibiotic resistance. Therefore, the authors conclude that antibiotics should not be routinely prescribed for uncomplicated acute sinusitis.4

Even with new evidence, habits are hard to change. A recent study conducted in the Netherlands attempted to investigate the prescription rate changes for adults with acute rhinosinusitis after a 2005 primary care guideline announcement, which promoted more cautious use of antibiotics. There was minimal response to these guidelines, as the antibiotic prescription rate showed only a slight, yet statistically significant, decrease from 62 per 100 episodes to 56 per 100 episodes (95% CI: 53–59).1 Within the United States, a recent study evaluated changes in patterns of care before and after the clinical practice guidelines were released in 2007. Multiple markers of care for adult sinusitis patients were investigated, and interestingly, the rate with which patients were treated with an antibiotic prescription statistically significantly increased after guideline publication from 75.5% ± 3.9% to 85.7% ± 3.0% (P = .021).5

**BEST PRACTICE**

With the evidence in front of us, we advocate for a change in the prescription habits of primary care physicians providing care to patients with acute rhinosinusitis. In our opinion, with the exception of the very small number of patients with clinical signs of serious complications from acute sinusitis, the published evidence suggests that routine antibiotic treatment in the primary care setting offers little clinical benefit and does have associated adverse effects and leads to the development of antibiotic resistance. However, although antibiotics are not indicated for use in all acute rhinosinusitis patients, acute uncomplicated rhinosinusitis patients are likely a diverse group, and future work may identify clinical factors to suggest patient populations for which antibiotics are indicated.

**LEVEL OF EVIDENCE**

This review includes evidence from a meta-analysis of randomized controlled trials (level 1a), a randomized controlled trial (level 1b), and two retrospective cohort studies (level 2b).

**BIBLIOGRAPHY**