

Common antibiotics increase risk of cardiac arrhythmias, cardiac death

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Macrolides—a group of commonly used antibiotics for bacterial infections like pneumonia, bronchitis, and some sexually transmitted diseases—are associated with a small but statistically significant increased risk of sudden cardiac death, according to a meta-analysis of 33 studies involving more than 20 million patients published today in the *Journal of the American College of Cardiology*.

Researchers from China analyzed data from studies conducted between 1966 and 2015, comparing patients treated with macrolides to similar patients treated with other antibiotics or with no antibiotic therapy.

The researchers found an average of 80 cases of ventricular tachyarrhythmias—rapid heartbeat that can lead to sudden cardiac death—per million treatment courses in patients who were not taking macrolides. The current use of macrolides accounted for an additional 118 ventricular tachyarrhythmias or related sudden [cardiac deaths](#) per million treatment courses; 36 additional sudden cardiac deaths from causes other than ventricular tachyarrhythmia; and 38 additional cardiovascular deaths per million treatment courses.

Past use of macrolides and use of other antibiotics were not associated with increased cardiovascular risk in the study. In addition, the use of macrolides was not associated with increased all-cause death, possibly because of the relatively small effect and an [increased risk](#) of cardiac death might be partly offset by the survival benefit of anti-infection by macrolides.

"The absolute risks of sudden cardiac death and cardiac death are small, so it should likely have limited effect on prescribing practice," said Su-Hua Wu, M.D., Ph.D., of the Department of Cardiology at the First Affiliated Hospital at Sun Yat-Sen University in Guangzhou, China, and one of the study authors. "However, given that macrolides are one of the most commonly used antibiotic groups

and millions of patients are prescribed these drugs annually, the total number of sudden cardiac deaths or ventricular tachyarrhythmias and cardiac deaths may not be negligible."

In an accompanying editorial, Sami Viskin, M.D., of the Tel Aviv Medical Center and Sackler School of Medicine at Tel Aviv University in Tel Aviv, Israel, put the numbers into perspective saying that the data shows that 1-in-8,500 patients treated with a macrolide antibiotic could develop a serious arrhythmic event, and 1-in-30,000 patients treated might die from the treatment.

Researchers separately examined commonly used macrolides azithromycin, clarithromycin, and erythromycin. In this analysis, researchers found all were associated with increased risk of [sudden cardiac death](#) or ventricular tachyarrhythmias; and azithromycin and clarithromycin were associated with increased risk of cardiovascular death, but only clarithromycin was associated with increased risk of all-cause mortality. "The heart safety of each macrolide needs to be better understood to help guide clinical treatment decisions," Wu said.

Study limitations include limited data on macrolide doses in observational studies, the lack of individual participant data and the retrospective nature of all meta-analyses. The study authors said large randomized controlled trials are needed to confirm these findings.

In the editorial, Viskin said macrolides are the first-line agents for a variety of illnesses and he noted methods for mitigating the risk while calling for "a consensus paper on how to deal with these hot potatoes."

"Today, when antimicrobial resistance represents a major threat to global health and new treatment options are frighteningly few, losing an entire class of antibiotics would represent a major setback in the fight against infections. Furthermore, it takes

years to fully understand the consequences of a drug's disappearance."

Provided by American College of Cardiology

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