Antibiotics do not reduce risk of dying in adults hospitalised with common respiratory infections, suggests study

March 25 2023

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Most patients admitted to hospital with acute viral respiratory infections are given antibiotics. Now new research to be presented at this year's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Copenhagen, Denmark (15-18 April), suggests that prescribing antibiotic therapy to adults hospitalized with common viral respiratory infections such as influenza is unlikely to save lives.

"Lessons from the COVID-19 pandemic suggest that antibiotics can safely be withheld in most patients with viral respiratory infections, and that fear of bacterial co-infections may be exaggerated," says lead author Dr. Magrit Jarlsdatter Hovind from Akershus University Hospital and the University of Oslo, Norway. "Our new study adds to this evidence, suggesting that giving antibiotics to people hospitalized with common respiratory infections is unlikely to lower the risk of death within 30 days. Such a high degree of potentially unnecessary prescribing has important implications given the growing threat of antimicrobial resistance."

Respiratory infections account for around 10% of the global disease burden and are the most common reason for prescribing antibiotics. Many infections are viral and do not require or respond to antibiotics, but concerns about bacterial co-infection often lead to precautionary antibiotic prescribing.

Concerns around bacterial co-infection in COVID-19 led to widespread use of antibiotics in hospitals and the community. Studies report that in some countries, antibiotics were prescribed for around 70% of COVID-19 patients, even though their use was only justified in about 1 in 10 of them [1].

In this analysis, Norwegian researchers retrospectively assessed the impact of antibiotic therapy on mortality in 2,111 adults admitted to Akershus University Hospital with a nasopharyngeal or throat swab at hospital admittance that was positive for influenza virus (H3N2, H1N1, influenza B; 44%, 935/2,111), respiratory syncytial virus (RSV; 20%, 429/2,111) or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; 35%, 747/2,111) between 2017 and 2021.

Tests that were part of the clinical routine during hospital admittance with respiratory infections were registered, including blood cultures and

nasopharyngeal or throat swabs for common viral and bacterial pathogens. Patients with a confirmed bacterial pathogen and patients with other infections requiring antibiotic therapy were excluded from this analysis.

Antibiotic therapy was initiated in over half (55%; 1153/2,111) of patients with viral respiratory infections at admission to hospital. A further 168 patients were given antibiotics later during hospitalization. In total, 63% (1,321/2,111) of patients received antibiotics for respiratory infection during their time in hospital (including at admission; see figures in notes to editors).

Overall, 168 (8%) patients died within 30 days—119 patients prescribed antibiotics at admission, 27 patients given antibiotics later during their hospital stay, and 22 patients not prescribed antibiotics.

Analyses adjusting for virus type, sex, age, severity of disease, and underlying illnesses, found that patients prescribed antibiotics at any time during their hospital stay (including at admission) were twice as likely to die within 30 days than those not given antibiotics, and risk of mortality increased by 3% for each day of antibiotic therapy compared with those not given antibiotics. Whereas, initiating antibiotics at hospital admission was not associated with an increased risk of death within 30 days.

"Although the analyses were adjusted for disease severity and underlying disease, this paradoxical finding may still be due to an antibiotic prescription pattern where the sicker patients and those with more underlying illnesses were both more likely to get antibiotics and to die", explains Dr. Hovind.

She continues, "Reducing the use and duration of in-hospital antibiotic therapy in patients with viral respiratory infections would reduce the risk

of side effects from antibiotic exposure and help tackle the growing threat of antibiotic resistance. However, more robust evidence is needed from prospective randomized trials to determine whether patients admitted to hospital with viral respiratory infections should be treated with antibiotics."

The authors note some limitations to their study, including that it is an observational study so can't prove causation, and although virus type, age, sex and underlying illnesses were adjusted for in the analysis, there may have been other factors that were unreported, such as smoking and socioeconomic background, that may have influenced the outcome. In addition, data were not available for biochemistry/biomarkers such as white blood cell (WBC), C-reactive protein (CRP), and creatinine.

More information: [1] Steffanie A Strathdee et al, Confronting antimicrobial resistance beyond the COVID-19 pandemic and the 2020 US election, *The Lancet* (2020). DOI: 10.1016/S0140-6736(20)32063-8

Provided by European Society of Clinical Microbiology and Infectious Diseases