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Title

How likely is it that a specific virus or bacteria is causing symptoms of an acute lower respiratory tract infection? EAST-PC

Priority 1 (Research Category)

Acute respiratory infections

Presenters

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Abstract

BACKGROUND: The likelihood that a detected virus or bacteria is responsible for symptoms has not been well described in outpatients with lower respiratory tract infection (LRTI).

METHODS: We conducted a case-control study in US outpatient settings that enrolled patients aged 18 to 75 years with acute LRTI and controls without respiratory symptoms between 2019 and 2023. All patients underwent PCR testing for 46 bacterial and viral pathogens by the CDC Respiratory Branch Laboratory. The Positive Etiologic Predictive Value was calculated to determine the probability that a virus or bacteria was the cause of symptoms.

RESULTS: We enrolled 618 adults with acute LRTI who had a valid specimen for PCR, and 497 asymptomatic persons as controls. Viruses and bacteria were identified at a similar prevalence (28%) in symptomatic patients, while bacteria were detected more often than viruses in asymptomatic individuals (31% versus 12%). Viruses identified as highly likely to be pathogenic included influenza A and B, parainfluenza, human metapneumovirus, respiratory syncytial virus, SARS-CoV-2, and rhinovirus. Human seasonal coronaviruses were classified as probably pathogenic. Moraxella catarrhalis and Haemophilus influenza were the only bacteria likely be a pathogen when detected. Other than influenza, confidence intervals were broad for these potential pathogens, and too broad to draw firm conclusions for most bacteria.

CONCLUSIONS: When detected, viruses are likely to be the cause of symptoms. This is less clear for bacteria, many of which are likely commensal. As multi-pathogen PCR tests become widely used, these results can help inform their interpretation and guide therapy decisions.