

Characteristics of Medically-Attended Respiratory Infections in High-Risk Adults



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Background: The similar clinical presentation of different respiratory viruses makes precise diagnoses difficult without dedicated laboratory testing. Laboratory testing for seasonal respiratory viruses, however, is not routine in clinical environments. This limited testing results in knowledge gaps of the burden of these respiratory viruses in adults. The purpose of this study is to understand the symptoms and severe outcomes of medically-attended respiratory infections caused by human metapneumovirus, parainfluenza virus, adenovirus, and other non-influenza, non-RSV respiratory pathogens, in adults with underlying high-risk conditions.

Methods: We conducted an observational study to examine the characteristics of non-influenza, non-RSV medically-attended acute respiratory infections (MAARI) in adults with high-risk conditions. This analysis used data from re-tested respiratory specimens, collected from high-risk adults that participated in the flu vaccination effectiveness (FluVE) study from 2015-16 through 2019-20 winter seasons. Electronic health records were linked to VE study information, including laboratory viruses, from enrolled participants. We conducted univariate analyses to identify a) demographic characteristics and underlying health conditions associated with non-influenza, non-RSV respiratory pathogen infection and severe outcomes and b) the relationship between infection and non-influenza, non-RSV respiratory pathogens and severe outcomes. Additionally, we used multivariable logistic regression modeling to examine associations between underlying high-risk conditions and risk of contracting each pathogen.

Results: There were 3,575 participants in this study with complete information available for analysis. In primary analyses, we found that most sociodemographic characteristics did not have statistically significant ($p < 0.05$) associations with non-influenza, non-RSV respiratory pathogens. Secondary analyses did not reveal any statistically meaningful relationships between hospitalization and ICU admissions according to infection status for any pathogen. We observed several instances of high-risk conditions showing a statistically significant relationship with specific pathogens. Individuals with seasonal coronavirus infection were more likely to have underlying chronic respiratory disease ($p < 0.01$), and individuals with adenovirus infection were more likely to have underlying cardiovascular disease ($p < 0.01$), compared to individuals not infected with those pathogens. Furthermore, having any respiratory condition showed a decrease in relative risk for human metapneumovirus (CI: 0.5 – 0.9) and an increase in relative risk for seasonal coronaviruses (1.1-1.7) compared to individuals testing negative for both these pathogens, respectively.

Conclusions: We did not identify consistent statistically significant relationships between sociodemographic characteristics or severe illness outcomes and infection with non-influenza, non-RSV respiratory pathogens. Future research should investigate the relationships between underlying disease and potential outcomes of respiratory infections.