

Incidence and characteristics of concomitant bacterial infection in hospitalized patients with a positive viral respiratory panel

Madeline W. Stesney OMS II | Des Moines University

Jonathan Hurdelbrink PhD, Nick Kluesner MD, Akshay Khatri MD, Sudhir Kumar MD, Hayden Smith PhD, Matt Trump DO, Clint Hawthorne MD | UnityPoint Hospital

Introduction

Patients presenting to Emergency Departments (ED) in the United States with signs and symptoms of infection may receive multiplex molecular testing for respiratory virus detection. Although most respiratory infections are caused by viruses, it is difficult to differentiate between viral or bacterial infection only by clinical signs and symptoms. This study sought to determine the frequency of concomitant bacterial infection present in patients admitted to the hospital with a positive viral target on molecular testing. Clinical variables associated with concomitant bacterial infections were analyzed to better identify which patients with positive viral targets might benefit from antibiotics.

Figure 1. Inclusion Criteria

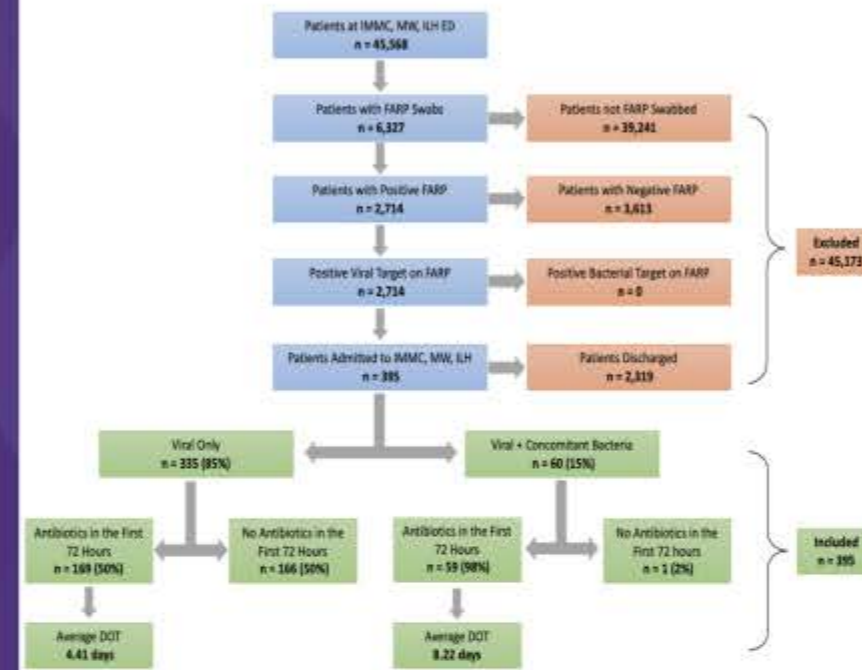
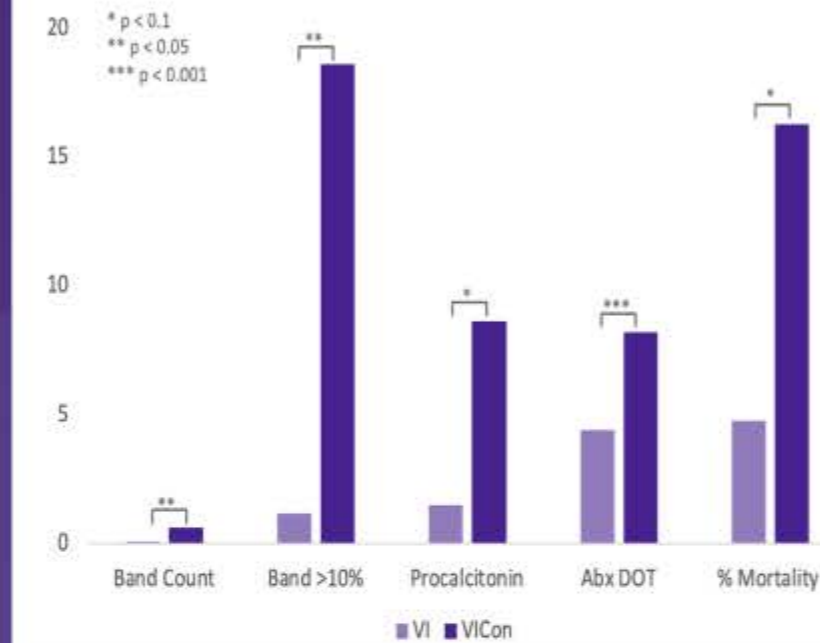


Figure 2. Vi vs ViCon



Conclusion

In this retrospective study, positive viral target on FARP for patients being admitted to the hospital is associated with a 1 in 5 chance of a concomitant bacterial infection. Given its frequency, patients being admitted to the hospital with a positive viral target on FARP should have a thorough ED work up and be considered for targeted antibiotic administration in select patients. This study opens the door to develop parameters for bandemia and procalcitonin levels to aid in clinical decision making when considering the need for antibiotic treatment in patients being admitted to the hospital with a positive viral FARP and potential bacterial concomitant infection.

Methods

- A retrospective observational study at three EDs located in the greater Des Moines from July 2022 through December 2022
- Inclusion criteria included patients admitted to the hospital with a positive viral target on FilmArray Respiratory Panel (FARP)
- A multidisciplinary chart review by Infectious Diseases, Pulmonology/Critical Care, and Emergency Medicine physicians classified patients as viral infection only or viral plus concomitant bacterial infection
- Pneumonia diagnoses were validated by a pulmonologist blinded to the diagnosis with a number of controls without a pneumonia diagnosis included.
- Two infectious disease physicians evaluated each positive blood, urine, and respiratory cultures and made a determination as to the implications of the results. There was 100% agreement between the two physicians.
- All diagnostic tests were only included if they were performed within the first 72 hours of ED presentation to avoid including those with nosocomial infection

Results

During the six-month study period, 45,568 patients were seen at three EDs, with 6,327 having FARP testing performed and 2,714 of those patients with a positive viral target detected. Of these positive viral patients, 395 were admitted to the hospital. Among those hospitalized, 77% were categorized as viral only infections (Vi) and 22% categorized as a concomitant bacterial infection (ViCon) (Figure 1). Bandemia >10% was more common in ViCon group compared to Vi group (15.00% vs 1.19%, $p = 0.005$). Procalcitonin values were higher in ViCon vs Vi group as well (10.6 vs 1.5, $p = 0.012$). Antibiotic days of therapy (DOT) for Vi patients was shorter than the ViCon group (4.41 DOT vs 8.22 DOT, $p < 0.0001$) (Figure 2). Finally, the PPV for concomitant bacterial infection with bandemia $\geq 5\%$ and $\geq 10\%$ were 0.81 and 0.692, respectively.

References

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