



## Journal Scan

## Risk factors associated with severe outcomes in adult hospitalized patients according to influenza type and subtype

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Influenza A and B, the two influenza viruses that cause epidemics in humans, are responsible for substantial annual morbidity and mortality worldwide. Each year an estimated 10–20% of persons have influenza, although there is significant year-to-year variability. Most infections are self-limited, requiring no healthcare visits, but a proportion of cases present severe complications mainly in people with underlying health conditions, in young children, and the elderly. Annual excess mortality has increased perhaps because of an increasing number of elderly and immunocompromised individuals. Studies of the facts associated with mortality and intensive care unit (ICU) admission are scarce. An observational epidemiological case-to-case study was carried out in Catalonia in adult patients hospitalized owing to severe acute influenza virus infection. In this series of hospitalized cases of severe influenza from 2010 to 2016, subtype A(H1N1)pdm09 was the most common, followed by influenza A(H3N2), whereas influenza

type B was less frequent. A total of 1726 hospitalized patients aged >18 years were inducted during the study period. It was found that patients with influenza A(H1N1)pdm09 required ICU admission more frequently, followed by patients with influenza B and patients with influenza A(H3N2). The greatest mortality rate was seen for subtype A(H3N2).

Patients aged  $\geq 75$  years were less frequently admitted to the ICU than those aged 18–64 years in all influenza types/subtypes, and the 65- to 74-year age group was also associated with a lower frequency of ICU admission for all patients with influenza type A, but the statistical power was low for influenza A subtypes and influenza type B. These results contrast with those related to death, which was higher in patients aged 65–74 and  $\geq 75$  years for all influenza type and subtypes.

Men were more frequently admitted to the ICU than women, but this association was only significant for influenza type A. In this study, gender was not associated with death for any influenza type or subtype. It was found that 161 patients requiring ICU care had chronic obstructive pulmonary disease (COPD), but this was statistically significant only for influenza type B. Obesity was associated with ICU admission in patients with influenza A. It was seen that chronic renal disease was associated with death in influenza type B cases but not in cases of influenza A(H1N1)pdm09 or A(H3N2).

Immune deficiency was associated with ICU admission and death in patients with influenza A(H1N1)pdm09. Chronic cardiovascular diseases were a protective factor against ICU admission in patients with influenza B and were a risk factor for death in patients with influenza A(H1N1)pdm09. Antiviral treatment administered  $\leq 48$  hours after the symptom onset prevents death in all patients with influenza A. Seasonal influenza vaccination was associated with a reduced risk of ICU admission in patients with influenza A.

This study concluded that the predictor of poor outcomes of influenza may vary by type/subtypes. Older age was a differential factor in patients hospitalized owing to severe influenza with respect to ICU admission and death. Although age  $\geq 65$  years was a risk factor for death in all influenza types and subtypes and especially for type I, age >75 years was associated with lower ICU admission for all influenza types and subtypes. The comorbidity with the closest association with death was immune deficiency, mainly in patients with influenza type B.

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A retrospective study at the intensive care unit was performed to determine the outcome of severe H1N1 pneumoniae. It was found that for patients with H1N1 influenza pneumonia admitted to the ICU with mechanical ventilation, there is a high probability of developing acute respiratory distress syndrome (ARDS) with a recent mortality rate. For patients with ARDS due to H1N1 influenza pneumonia, the tidal volume and sequential organ failure assessment (SOFA) score are the predictor of hospital mortality. The higher tidal volume and SOFA score are identified as the risk factors for hospital mortality.<sup>1</sup>

### Comments

H1N1 infection is also common in our setup. We conducted a cross-sectional study on mortality predictors of H1N1 influenza outbreak in 2015 in the northern part of India. The study showed that laboratory parameters such as serum aspartate transaminase and serum alanine transaminase raised bilirubin, and total leukocyte count (TLC) may be very helpful in prognosis of the patients with severe H1N1 infection. It was found that older patients with deranged hepatic parameters and raised total leucocyte count had poor prognosis.<sup>2</sup>

In another study from our center, we found that outbreak of

H1N1 influenza led to increased morbidity and mortality. A high infection rate and virulence created panic among masses and huge healthcare burden. It also severely affected the socioeconomic framework of the country with a mean expenditure of 3325 USD.<sup>3</sup>

Influenza has now become a major illness especially in high risk population such as elderly, patients with diabetes kidney & heart illness, patients with pre-existing lung disease and also in pregnancy. Vaccination programme can help to reduce severity and hospitalisation in high risk population.

### Conflict of interest

None.

### References

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