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SYNOPSIS

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Review of "Characteristics and outcomes of hospital admissions for COVID-19 and influenza in the Toronto area"

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One-minute summary

- This study compared patient characteristics, resource use, clinical care and outcomes for 1735 adult patients with COVID-19 and influenza. The study setting was in 7 hospitals in Toronto and Mississauga, Ontario during the first wave of the pandemic.
- Compared with influenza patients, patients with COVID-19 had significantly greater:
  - In-hospital mortality (unadjusted 19.9% v. 6.1%, adjusted relative risk [RR] 3.46, 95% confidence interval [CI] 2.56–4.68);
  - Intensive Care Unit (ICU) use (unadjusted 26.4% v. 18.0%, adjusted RR 1.50, 95% CI 1.25–1.80);
  - Hospital length of stay (unadjusted median 8.7 days v. 4.8 days, adjusted rate ratio 1.45, 95% CI 1.25–1.69).
- Thirty-day readmission was not significantly different (unadjusted 9.3% v. 9.6%, adjusted RR 0.98, 95% CI 0.70–1.39) between COVID-19 and influenza patients.

Additional information

- The study included patients admitted and discharged at 5 academic and 2 community-based teaching hospitals between November 1, 2019 and June 30, 2020. The study used a retrospective cohort design using data from GEMINI, a hospital research collaborative.
- The study captured almost one-quarter (23.5%) of all Ontario hospital admissions for COVID-19 (n = 4373) during the study period. The study considered 1027 hospital admissions with COVID-19 (including 944 laboratory-confirmed diagnoses) in 972 unique patients and 783 admissions with influenza in 763 unique patients.

- Various statistical tests and analyses were used as well as sub-group and sensitivity analyses.
- Patients with COVID-19 and influenza had a median age of 65 years (interquartile range [IQR] 53–79) and 68 years (IQR 55–80), respectively. Patients with COVID-19 were more likely to be male (59.1% v. 50.8%) and reside in long-term care (11.7% v. 4.5%).
- Patients living in neighbourhoods with lower income appeared to be over-represented in both COVID-19 (Quintile 1 (Q1) 34.2% v. Q5 10.9%) and influenza (Q1 31.7% v. Q5 12.1%) groups, Q1 to Q5 representing the lowest to highest income.
- Among patients with COVID-19 who were 'younger than 50 years', '50–75 years' and 'older than 75 years of age';
    - Unadjusted mortality was 5.1%, 13.5% and 38.9%;
    - ICU use among each age group was 29.8%, 35.2% and 11.3%;
    - 30-day readmission was 9.2%, 9.9% and 7.9%, respectively.
- Patients with COVID-19 were more likely to receive invasive mechanical ventilation (18.5% v. 9.3%, $p < 0.001$), but less likely to receive bronchoscopy (2.0% v. 5.6%, $p = 0.005$).
- The authors note that the significantly greater mortality, ICU use and hospital length of stay in COVID-19 patients may be a result of low levels of immunity to the novel coronavirus, compared with seasonal influenza. In contrast, patients may have some immunity from past influenza infections and vaccination. The differences identified in severity between COVID-19 and influenza patients may change as immunity to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) increases and effective therapies are developed.
- For the 7 mortality prediction tools assessed, discriminative accuracy was best for the modified Acute Physiology and Chronic Health Evaluation (mAPACHE) (area under the receiver operating characteristic curve (AUC) 0.86 for cases with complete data and 0.81 after imputation), the critical illness severity scoring system (CISSS) (AUC 0.83 for cases with complete data and 0.80 after imputation), and the ISARIC Coronavirus Clinical Characterisation Consortium 4C (ISARIC-4C) (AUC 0.78 after imputation).

PHO reviewer's comments

- The study is an 'early' release and subject to revision. Nonetheless, the authors described detailed use of statistical and sensitivity analyses to support their findings.
- The study compares various COVID-19 patients and influenza patients. It is worth noting that the comparator, influenza, also has a large burden of morbidity and mortality.
- At the time of the first wave of the pandemic, no known variants of concern (VoC) had been identified. It is uncertain how the VoCs would affect the study findings, if this study was to be repeated in the current context, but there are concerns that disease severity is higher with some VOCs.[1]

- As this document is a 'Synopsis', it describes limited findings from the study. The study provides a large number of other findings that may be of use to the reader.

References

1. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 UK variant VOC-202012/01 – what we know so far [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2021 Feb 16]. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/2020/12/what-we-know-uk-variant.pdf?la=en

Citation

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