

SYNOPSIS

04/12/2020

Review of “Factors associated with prolonged viral RNA shedding in patients with COVID-19”

Article citation: Xu K, Chen Y, Yuan J, Yi P, Ding C, Wu W, et al. Factors associated with prolonged viral RNA shedding in patients with COVID-19. Clin Infect Dis. 2020 Apr 9 [Epub ahead of print]. Available from: <https://doi.org/10.1093/cid/ciaa351>

One-Minute Summary

- This retrospective cohort study examined risk factors for prolonged viral RNA shedding in 113 confirmed coronavirus disease 2019 (COVID-19) patients from two hospitals outside of Hubei province, China.
- The median duration of viral RNA detection post symptom onset (PSO) was 17 days (interquartile range [IQR]: 13-22).
- Demographic and clinical characteristics by viral RNA shedding duration PSO (<15 days [n=37] versus ≥15 days [n=76]) (P≤0.05):
 - Age (years [IQR]): 48.0 (34-61) vs. 54.5 (45-63)
 - Male: 40.5% vs. 67.1%
 - Severe illness at admission: 16.2% vs. 34.2%
 - Hypertension: 8.1% vs. 30.3%
 - Duration of symptom onset to admission (days [IQR]): 4 (2-6) vs. 6 (4-9)
- Outcome characteristics by viral RNA shedding duration since PSO (<15 days [n=37] versus ≥15 days [n=76]) (P≤0.05):
 - Duration of viral RNA shedding (days [IQR]): 11 (8-13) vs. 20 (16.5-25.5)
 - Duration of symptom onset to negative radiograph (days [IQR]): 12 (10-15) vs. 16 (13-21)
 - Duration of symptom onset to normal temperature (37.5°C) (days [IQR]): 7 (6-11) vs. 11 (10-14)
 - Duration of hospitalization (days [IQR]): 13.5 (11.5-17) vs. 22 (16-30)
 - Occurrence of acute respiratory distress syndrome, sepsis or septic shock during hospitalization (# of patients): 2 vs. 21
- Factors independently associated with longer duration of viral RNA shedding were duration of symptom onset to admission (odds ratio [OR] = 1.3; 95% confidence interval [CI]: 1.1-1.5), male sex (OR = 3.2; 95% CI: 1.3–8.0) and invasive mechanical ventilation (OR = 9.9; 95% CI: 1.1-88.0).

Additional Information

- The authors performed real-time reverse transcription-polymerase chain reaction (RT-PCR) on clinical specimens (nasopharyngeal swab, throat swab, sputum, endotracheal aspirate,

bronchoalveolar lavage fluid) collected daily from patients to detect viral RNA shedding. Less than 10% of all clinical specimens were nasopharyngeal or throat swabs.

- Patients were admitted to one of the two hospitals from January 13 through February 19, 2020 and **enrolled in this study if they met one of the following criteria:**
 - Patient RNA positive for > 21 days PSO and remained hospitalized
 - Patient RNA positive for ≤ 21 days PSO
 - Patient died within 21 days PSO
- Mild cases included those with pneumonia. Severe cases included those with severe pneumonia, acute respiratory distress syndrome (ARDS), sepsis and septic shock.
- 84/113 (74.3%) of patients showed viral RNA clearance before 21 days PSO, 69/84 (82.1%) were discharged, 13/84 (15.5%) remained hospitalized and 2/84 (2.4%) died. The remaining 21/113 (18.6%) patients did not show viral RNA clearance and remained hospitalized.

PHO Reviewer's Comments

- Further work is needed to understand the sex-specific mechanisms of COVID-19 infection.
- As noted by the authors, we currently do not know how viral RNA shedding correlates to infectious virus shedding; therefore, we cannot draw conclusions concerning the potential of these patients to act as sources of new infection.
- Since there were multiple sources of clinical specimens and that variables were not studied according to clinical specimen, there is potential bias when comparing viral RNA shedding.
- It is not clear if some of those “cleared” of viral RNA might revert to shedding later.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of “Factors associated with prolonged viral RNA shedding in patients with COVID-19”. Toronto, ON: Queen’s Printer for Ontario; 2020.

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