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SYNOPSIS

03/30/2020

Review of "Association of cardiac injury with mortality in hospitalized patients with COVID-19 in Wuhan, China"

Article citation: Shi S, Qin M, Shen B, Cai Y, Liu T, Yang F, et al. Association of cardiac injury with mortality in hospitalized patients with COVID-19 in Wuhan, China. JAMA Cardiol. 2020 Mar 25 [Epub ahead of print]. Available from: https://doi.org/10.1001/jamacardio.2020.0950

One-minute summary

- The authors estimated the association between cardiac injury and mortality in 416 hospitalized patients with confirmed coronavirus disease 2019 (COVID-19) in a hospital in Wuhan, China.
- Patients had a median age of 64 years (range: 21-95) and 211 (51%) were female.
- Compared to 334 patients without cardiac injury, the 82 (20%) patients with cardiac injury:
    - were **older** (median age of 74 vs. 60 years), had **higher cardiac biomarkers**, and a higher prevalence of bilateral **pneumonia**.
    - had **more comorbidities**, including: hypertension (60% vs. 23%), diabetes (24% vs. 12%), coronary heart disease (29% vs. 6%), cerebrovascular disease (26% vs. 3%), and chronic heart failure (15% vs. 2%).
    - had **higher treatment use**, including: noninvasive ventilation (47% vs. 4%) and invasive mechanical ventilation (22% vs. 4%), as well as treatment with antibiotics (83% vs. 50%), glucocorticoids (88% vs. 70%), and intravenous immunoglobulin (83% vs. 57%).
    - had a **greater number of complications**, including: acute respiratory distress syndrome (ARDS) (59% vs. 15%), acute kidney injury (9% vs. 0%), electrolyte disturbances (16% vs. 5%), hypoproteinemia (13% vs. 5%) and coagulation disorders (7% vs. 2%).
- Patient outcomes during follow-up:
    - among those with cardiac injury: 42 deaths (51%), 2 discharged (2%) and 38 (46%) remained hospitalized.
    - among those without cardiac injury: 15 deaths (5%), 38 discharged (23%) and 281 (72%) remained hospitalized.
- **Cardiac injury was associated with a higher risk of mortality** in hospitalized COVID-19 patients, both during the time from symptom onset (hazard ratio [HR]=4.3, 95% confidence interval [CI] 1.9-9.5) to end point and from admission to end point (HR=3.4, 95% CI 1.6-7.2).

Additional information

- This retrospective cohort study included laboratory confirmed COVID-19 cases from January 20 to February 10, 2020 with follow-up through February 15, 2020.

- Cardiac injury was defined as blood level cardiac biomarkers above the 99th percentile upper reference limit.
- Mean time from symptom onset (16 vs. 17 days) and from admission (6 vs. 8 days) to mortality was shorter in patients with cardiac injury compared to those without injury, despite a similar median time from symptom onset to hospital admission in both groups (10 vs. 10 days).
- The association between cardiac injury and mortality was adjusted for age, pre-existing cardiovascular diseases, cerebrovascular diseases, diabetes, chronic obstructive pulmonary disease, renal failure, cancer, ARDS, creatinine levels and N-terminal pro-B-type natriuretic peptide levels.
    - ARDS was also identified as an independent risk factor for mortality.
- Limitations of this study included: unknown clinical end points for many patients given many remained in hospital, and missing data which limited the determination of potential mechanisms of cardiac injury in patients with COVID-19.

PHO reviewer's comments

- The results from this study may not be generalizable to all hospital settings, as Renmin Hospital of Wuhan University was assigned with treating the most severe COVID-19 cases in Wuhan.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of "Association of cardiac injury with mortality in hospitalized patients with COVID-19 in Wuhan, China". Toronto, ON: Queen's Printer for Ontario; 2020.

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