Effects of COVID-19 on primary percutaneous coronary intervention admissions: is there hidden morbidity?

Authors: Asanish Kalyanasundaram,[A] Harshini Asogan[A] and Nyan Lin Myint[A]

Background

The COVID-19 pandemic has had significant consequences on the cardiovascular health of millions worldwide. There have, however, been limited data comparing patients admitted for primary percutaneous coronary intervention (PPCI) during the COVID era to those admitted in the pre-COVID era, which would be crucial in identifying hidden morbidity. This study considers all PPCI patients admitted to a large cardiothoracic hospital in 2019–2021.

Methods

The electronic health records of 530 patients (72.6% men; mean age 65.2 years; 14 COVID-positive) admitted to Royal Papworth Hospital (Cambridge, UK) via the PPCI pathway were interrogated for information on demographics, admission COVID status, admission blood test results, 30-day mortality and 6-month mortality. This group represented every patient admitted via this pathway during the following time frames: April 2019 to May 2019 and December 2019 to January 2020 (pre-COVID controls), April 2020 to May 2020 ('wave 1'), and December 2020 to January 2021 ('wave 2'). The pre-COVID time frames were chosen to be exactly one year earlier than wave 1 and 2 to control for seasonal variations. Unpaired two-tailed t-tests were performed using R to compare the characteristics of patients when grouped by wave or COVID status.

Results

Compared with the spring 2019 patients, the group admitted during spring 2020 (wave 1) had a lower proportion of males (64.5% vs 76.6%; p=0.045), a higher proportion of White patients (100% vs 86.3%; p=0.00002), higher admission D-dimer levels (mean 2,595 vs 135; p=0.013), and lower troponin levels on admission (mean 4,205 vs 6,868; p=0.04) and 12 hours post-admission (mean 17,948 vs 21,995; p=0.038). When compared with winter 2019/20 patients, those admitted during winter 2020/21 (wave 2) had a lower proportion of males (68.9% vs 80.3%; p=0.023) and higher lymphocyte counts (1.81 vs 1.42; p=0.043).

COVID-positive patients admitted in waves 1 and 2, compared with COVID-negative patients admitted during the same timeframes, were younger (mean 56 vs 66; p=0.027), had a lower lymphocyte count (mean 1.22 vs 1.75; p=0.025), and had a lower brain natriuretic peptide (BNP; mean 638 vs 4,923; p=0.025). They also showed a higher rate of 30-day mortality (21.4% vs 6.6%) and 6-month mortality (21.4% vs 8.9%), but neither result was statistically significant, likely owing to the small number of COVID-positive patients in the sample.

COVID-positive patients admitted during wave 1 were not statistically different on any recorded metric to COVID-positive patients admitted during wave 2, though again this may be in part due to the low sample size. Considering all patients in these waves shows that wave 1 patients were more likely to be White (100% vs 93.9%; p=0.001), and had a higher BNP (mean 3696 vs 658, p=0.03).

Conclusion

It is evident that during the COVID-19 pandemic, there was an increase in females undergoing PPCI in both waves, whereas the first wave particularly saw an increase in white patients. Biomarkers such as increased D-dimer, troponin and BNP were found to be significant in different waves. No major differences were found between the two variants of COVID infection. ∎

Author: [A]Royal Papworth Hospital, Cambridge, UK