Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Resuscitation

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Letter to the Editor

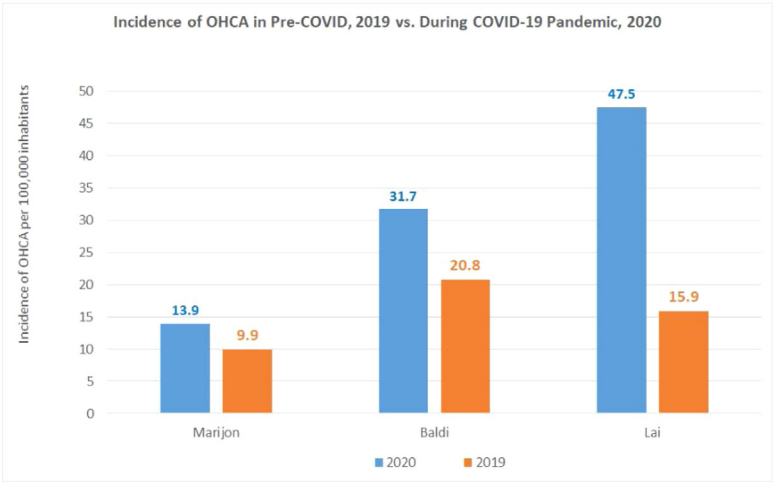
COVID-19 and out-of-hospital cardiac arrest: A systematic review and meta-analysis

During the COVID-19 pandemic, countries worldwide have witnessed an unprecedented decline in hospital emergency visits and even in acute coronary syndrome-related hospitalizations.[1,2] A high burden of cardiac injury has been seen in COVID-19 patients and also an increase in the out-of-hospital cardiac arrest (OHCA) has been reported in the during COVID-19 outbreak in various countries.[3] Therefore, we planned to do this meta-analysis to get an idea about the exact change in the OHCA incidence and mortality in the COVID-19 period compared to the pre-COVID-19 period. PubMed/Medline, Web of Science and SCOPUS search until July 15th, 2020 using keywords "Out of hospital cardiac arrest or OHCA, COVID-19, SARS-COV-2,2019-nCov" resulted in 41 articles of which we finally included 3 articles.[3–5] The random-effects model regardless of heterogeneity using Haenszel formula was used for Odds ratios (ORs) calculation.

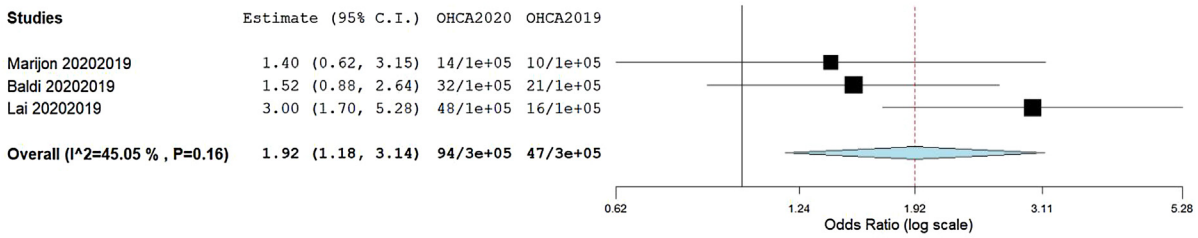
We found one study each from the USA, France, and Italy. Baldi et al. considered the COVID-19 period from the first documented case in the Lombardy Region (21 February 2020 –20 April 2020) and the same time frame (21 February 2019 –21 April 2019, to account for the leap year) in 2019. Lai et al. considered the COVID-19 period form the first case reported in New York (March 1 to April 25, 2020) and comparing the same period (March 1 to April 25, 2019) in the previous year. While for Marijon et al. we included week 10 to week 17 from the year 2020 and 2019. The frequency of OHCA increased from 9.9, 20.8, and 15.9 per 100,000 inhabitants in 2019 to 13.9, 31.7, and 47.5 per 100,000 inhabitants in 2020 in France, Italy, and the USA, respectively (Fig. 1). During the pandemic, the odds of out-of-hospital cardiac arrest was significantly higher [OR 1.92 (95% CI:1.18–3.14), $p < 0.001$; I^2:45.05%, $p = 0.16$] (Fig. 1). Besides, there were higher odds of mortality (OR 1.89 [95%CI: 1.25 –2.84], $p < 0.001$; I^2: 0.0%, $p = 0.72$) in patients with OHCA during the pandemic period compared to pre-pandemic.

In this meta-analysis, we found that there were nearly two times higher odds of admissions with OHCA in the COVID-19 pandemic period compared to the pre-pandemic period of 2019. Existing studies suggest that patients with OHCA in 2020 were older with a high burden of hypertension, diabetes, and had physical limitations.[3] A proportion of patients who suffered from OHCA in 2020 also had suspected or confirmed diagnosis of COVID-19 disease. COVID-19 related hyperinflammatory state leading to the high propensity of fatal arrhythmia, atherosclerotic plaque destabilization, thromboembolic state and myocardial injury could be a leading factor for OHCA in these patients. Failure to provide bystander cardiopulmonary resuscitation (CPR) owing to the social distancing during this pandemic period, evident from an increased rate of unwitnessed OHCA, and low frequency of shockable rhythm would have influenced the outcome in these patients.[3–5] Unwitnessed CPR and initial non-shockable rhythms are considered markers of poor prognosis in patients with cardiac arrest. In conclusion, the COVID-19 pandemic period has documented an increase in the rate of OHCA and OHCA-related mortality and warrants further studies to evaluate etiopathogenesis and avoid unprecedented events.

A.



B.



C.

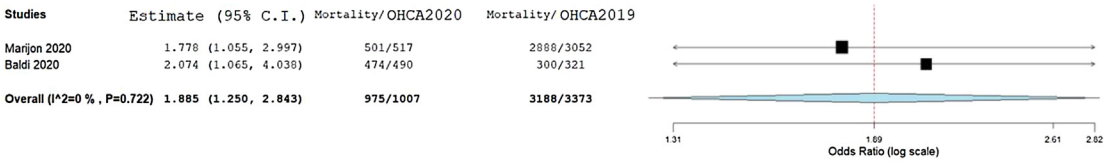


Fig. 1 – Meta-analysis of incidence and prognosis of OHCA. Bar graph showing Incidence (a), forest plot showing incidence (b) and mortality for OHCA during the COVID-19 pandemic in 2020 vs. pre-pandemic in 2019.

Conflict ofinterest

None.

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