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Letter to the Editor

Out-of-hospital cardiac arrest incidence in the different phases of COVID-19 outbreak



To the editor,

Last February, Europe was affected by the first wave of the COVID-19 pandemic. Now a second outbreak has begun. Albeit a close relationship between the pandemic trend and the incidence of out-of-hospital cardiac arrest (OHCA) has been documented during the first surge in different countries such as Italy^{1,2} the United States^{3,4} and France,⁵ some elements still remain unclarified.

Our aims were (1) to confirm the correlation between the incidence of OHCA and COVID-19 across a longer time period including the downward phase of the pandemic; (2) to compare the incidence of OHCA in the post- and pre-pandemic peak and (3) to verify whether the incidence OHCA correlated more closely with daily COVID-19 diagnoses or with the rate of ICU admissions. We considered all events of OHCA enrolled in the out-of-hospital cardiac arrest register of the Lombardy region (Lombardia CARE; ClinicalTrials.gov Identifier: NCT03197142) from January 1st, 2020 to October 9th, 2020 that have occurred in the

provinces of Pavia, Lodi, Cremona, Mantua and Varese (total area 9061 km²; total population of 2,435,939 inhabitants). The daily new cases of COVID-19 in the entire Lombardy region, as well as the daily count of COVID patients admitted in the intensive care units (ICU), were collected from National Department of Civil Protection (<http://www.protezionecivile.gov.it>). During the study period, 2488 OHCA occurred and resuscitation was attempted in 1629 of them (65.5%). The median age was 78 years (IQR 66–86 years); the event occurred at home in 1392 (85.5%); a medical aetiology was found in 1519 (93%); the event was witnessed in 756 (46.4%); the rhythm was non-shockable in 1393 (85.5%) and bystander CPR occurred in 519 (32%). As shown in Fig. 1, the trend of OHCA has followed the trend of the pandemic during both the ascending and the descending phase. A statistically significant correlation was found across the 283 days of observation, reinforcing the deep relationship between the pandemic and OHCA incidence. The

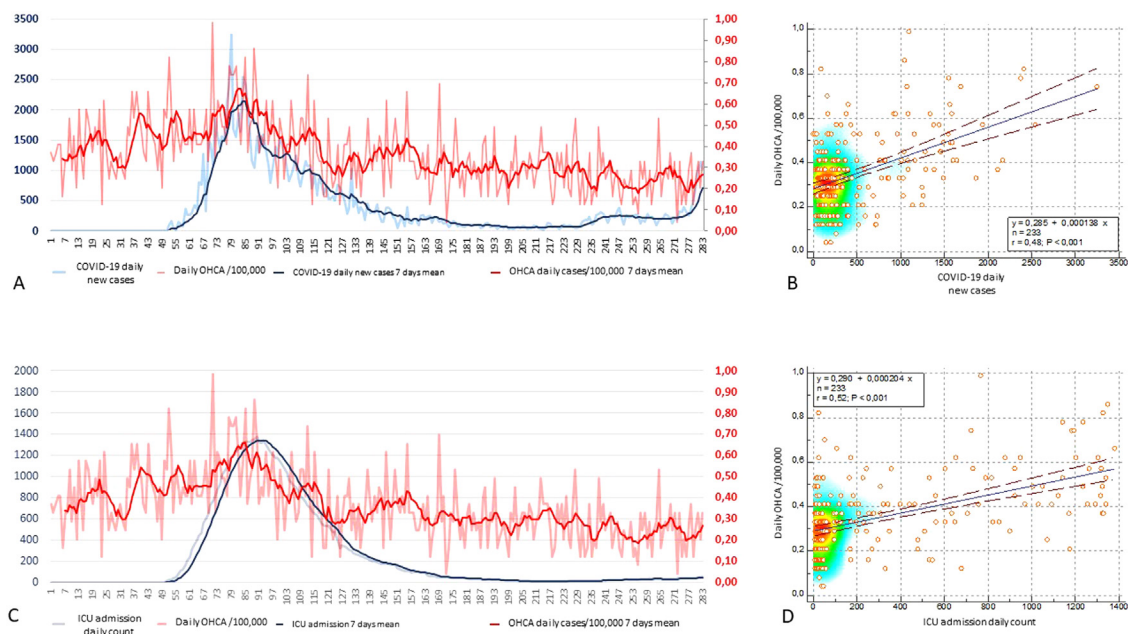


Fig. 1 – Panel A shows the daily OHCA incidence/100,000 (light red) and its 7-days mean (red) together with COVID-19 daily new cases (light blue) and its 7-days mean (blue) and their statistical correlation is provided in panel B. Panel C depicts the daily OHCA incidence/100,000 (light red) and its 7-days mean (red) together with the daily count of ICU patients (light blue) and its 7-days mean (blue) and their statistical correlation is provided in panel D.

median daily incidence of OHCA after the first peak (from day 150 onwards) was lower than before the rising phase (before day 50) [0.3 (IQR 0.2–0.4) vs 0.5 (IQR 0.3–0.6), $p < 0.001$] and was aligned with 2019 [0.3 (IQR 0.3–0.4)]. This suggests an absence of delayed disease- or pandemic-related effects able to maintain the higher rates of OHCA during the low incidence phase after the first pandemic peak. Finally, the daily rate of OHCA correlated significantly both with the daily number of new COVID-19 cases and with the daily count of ICU patients, with a slightly stronger correlation with the latter. However, the number of daily positive cases may depend more on the number of pharyngeal swabs performed in the geographic region under investigation than on the real severity of the disease, which is likely better expressed by the number of patients requiring an ICU admission.

In conclusion, the correlation between OHCA and COVID-19 pandemic has been confirmed over a longer period of observation. This observation could help in planning health strategies during the second surge and possible subsequent ones.

Conflict of interest

None.

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Appendix A.

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