Letter to the Editor

Relationship between patent foramen ovale and COVID-19 in patients admitted to an intensive care unit

Foramen oval permeable en pacientes ingresados por COVID-19 en cuidados intensivos

To the Editor,

In December 2019, an outbreak of coronavirus disease 2019 (COVID-19), which was caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), broke out in Wuhan, China.1,2 COVID-19 was of clustering onset and mainly affected the respiratory system with some patients rapidly progressing to acute respiratory distress syndrome (ARDS).3,4 Evidence shows that, while patients with COVID-19-associated respiratory distress syndrome meet the Berlin criteria for ARDS, they generally present with an atypical form of this syndrome.5

Patent foramen ovale (PFO) is an integral part of the normal fetal circulation. The anatomical closure of the foramen ovale occurs around the second year of life in the majority of the population,6 Autopsy and detailed contrast echocardiography studies demonstrate that anatomic closure is incomplete in approximately 1 in every 4 adults, with the frequency being similar in both sexes.7

PFO may have significant clinical implications. It may lead to several pathological conditions, notably right-to-left shunt, paradoxical embolism, hypoxemia, and cerebral fat embolism.8–11 Older patients with cryptogenic embolism and PFO exhibited a higher burden of cardiovascular risk factors.12 Mechanical ventilation, especially in patients with ARDS, may stretch the pulmonary vasculature and right ventricle, thus reversing the interatrial pressure gradient, leading to the foramen ovale opening and a right-to-left shunt.13,14 The prevalence of PFO is reported to be between 16% and 19% even in ARDS patients mechanically ventilated with protective ventilation strategies.15–17 A PFO shunt is associated with decreased effectiveness of positive end-expiratory pressure titration in improving oxygenation, greater use of adjunctive interventions, and longer times on mechanical ventilation and in the intensive care unit.17

For this reason, we decided to evaluate patients with COVID-19 under mechanical ventilation to identify PFO and the pathophysiological effects of this structural heart disorder on the treatment process of patients with COVID-19 and also to obtain an appropriate strategy for managing mechanical ventilation in these patients and evaluating its effectiveness in their recovery.

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AUTHORS’ CONTRIBUTIONS

S. Eskandari conceived of the presented idea and P. Jalali developed the theory. P. Jalali wrote the article in consultation with S. Eskandari.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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