

Cerebral Venous Thrombosis in Air Travelers during COVID-19 Times: Is the Risk Higher?

In early 2020, the new coronaviruses or SARS-CoV-2 has been linked to the most recent pandemic.^[1] This virus represents a great challenge for health systems worldwide, predominantly respiratory infectious agents leading to fast spread. One of the aspects of the economy that has been profoundly affected is air travel and transport. People who frequently use air transport face various health disorders that include cardiovascular disease, cognitive deficit, jet-lag, and venous thromboembolism, among others.^[2] Coronavirus induces a severe phenomenon of the inflammatory response, organic dysfunction, including the development of coagulopathy.^[3] Clinical studies have shown a significant number of thrombotic events in Chinese patients. It is important to mention that in the Chinese population, the risk of thrombosis is higher in comparison with Caucasians.^[4] In COVID-19 patients, the development of coagulopathy is linked to the severity of the disease stage. Among the abnormalities seen are elevation of D-dimer, increase in prothrombin time and in cases of extreme severity, reduction of fibrinogen levels.

More than 50 years ago, Louvel described a small series of patients who had venous thrombosis after air travel.^[5] Kuipers *et al.*, in a study carried out between January 2000 and December 2005, evaluated the occurrence of air travel-associated symptomatic venous thrombosis. This study concluded that there is a moderate risk of venous thrombosis in people who were exposed to more flights in a short time frame. Furthermore, in the same study, the flight duration was associated with increased risk, with longer duration, more risk.^[6] The use of oral contraceptives can also be a factor associated with venous thrombosis.^[7] Cerebral venous thrombosis is an infrequent pathology.^[8] Cases of cerebral venous thrombosis have been reported in patients who have recently been in air travel.^[9,10] It has been established that factors such as alcohol consumption, changes in the concentration of oxygen in the cabin and decreased humidity favors dehydration, ultimately leading to increased blood viscosity and hemoconcentration.^[10,11]

In this letter, we want to highlight the possible risk of the development of cerebral venous thrombosis in patients with SARS-CoV-2 infection due to its procoagulant effect. Given the risk of thrombotic events, and as other authors have suggested, we advocate the use of low molecular weight heparin in patients with a recent history of

SARS-CoV-2, mainly on transatlantic flights.^[10] In addition, warning signs should be recommended to patients with long-term flights. Research studies in this field are required in the future to determine the real risk of coronavirus infection and coagulopathies in patients using air transport.

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