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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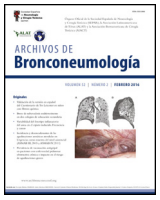

Editorial

[Translated article] Evaluation of Respiratory Sequelae in Patients With COVID-19, Where we are and Where we are Going. CIBERESUCICOVID and RECOVID Studies to Compare Patients Admitted to ICU vs Conventional Ward

Evaluación de secuelas respiratorias en los pacientes con COVID-19, dónde estamos y hacia dónde vamos. Estudios CIBERESUCICOVID y RECOVID para comparar pacientes ingresados en UCI vs. sala convencional

Since December 2019, humanity has been facing a new respiratory infection, COVID-19, the epidemic which has caused the highest number of deaths since influenza struck in 1918. Healthcare systems and medical knowledge were unprepared for this adversity and we have had to adapt to this new era. Progressive understanding of the disease has improved the prognosis of patients. Following the various waves of COVID-19 numbers, we are facing the tsunami of damage caused by the SARS-CoV-2 not only in the target organ, the lung, but also in other organs. Symptoms are known to persist for months after the acute phase. The cause is possibly multifunctional and is proving difficult to clarify. We are concerned about the longer-lasting and more serious impact on lung function and on the integrity of the lung parenchyma that occurs mainly in patients who have had more serious disease and who required invasive or non-invasive respiratory support.

Pulmonary fibrotic damage during the acute phase of disease has already been reported.[1] Three-month follow-up in both ICU and ward patients has so far shown the persistence of functional changes, such as decreased lung diffusion capacity manifested by reduced carbon monoxide transfer (DLCO) and persistent infiltrates on radiographic studies. A study of a single-center cohort [2]found that 3 months after discharge more than 80% of ICU patients had DLCO disturbances and more than 70% had reticular or fibrotic changes in chest tomography. These tomographic changes were associated with patient age and duration of mechanical ventilation. Lower DLCO is also observed in patients who required prone positioning and in women. Up to 23% of patients admitted to conventional wards showed lower DLCO at 2 months after discharge, especially women and smokers.[3] In a 6-month follow-up study of hospitalized patients conducted in China, more than 60% of patients had persistent symptoms, including fatigue and muscle weakness.[4] Interestingly, data from the UK [5]report that 29% of patients were readmitted and 12% died after discharge, and several respiratory diseases were diagnosed in 29.6% of cases. More than 40% of patients need to visit healthcare services for residual symptoms, most commonly fatigue and depression.[6] Although symptoms appear to improve over time, radiological and DLCO changes may persist beyond 12 months.[7]

Less information is available from large Spanish studies on damage and associated factors at 6 months. CIBERES and SEPAR have adopted a collaborative strategy to work towards the common objective of addressing this key issue of respiratory sequelae. This initiative is based on 2 consolidated multicenter studies supported by the Instituto de Salud Carlos III and the Integrated Respiratory Infections Program. Both studies are strategic and aim to be widely representative by including sites throughout Spain. The CIBERESUCICOVID study includes patients who required ICU admission between February 28, 2020 and February 28, 2021. This study is funded by the Instituto de Salud Carlos III and is coordinated by the CIBER Biomedical Network for Respiratory Diseases and supported by SEPAR and SEMICYUC.[8] The RECOVID study recruited patients admitted to standard hospital wards and treated by pulmonologists. The study design includes structured follow-up at 6 months after discharge, including clinical, radiological, and lung function studies (spirometry and DLCO), determination of quality of life (SF-12), possible infectious and cardiovascular complications, new hospital admissions, and, finally, long-term mortality. The data collection protocol has been standardized to better integrate the 2 studies and the Barcelona Computing Center will collaborate in the data analysis. It should also be noted that epigenetic and biomarker data will be collected from a subgroup of patients included in the CIBERESUCICOVID study to provide a more detailed characterization.

This project, which combines 2 databases with identical monitoring in 2 populations with different severity, will help answer several questions, including the potential existence of common patient characteristics (e.g., gender) despite initial severity, toxic habits, or previous comorbidities such as smoking or COPD. Finally, investigators will be able to assess the impact of the degree of inflammation during the acute episode in patients with or without mechanical ventilation. We expect to see common characteristics

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in both cohorts and certain specific factors associated with each intervention and treatment.

Lastly, we hope to determine the long-term impact of radiographic or functional changes, which could have a negative effect on patients, making them more vulnerable to future pulmonary events. Both studies plan a visit 1 year post-admission, which will allow us to perform a longitudinal study of the longer-term effects of COVID-19.

Currently, vaccination campaigns and the emergence of new strains have changed the epidemiological characteristics of the infections, and younger people are being affected to a greater extent. Time will tell whether the long-term impact on this population will be similar, and if it is, the consequences on this generation in terms of quality of life and economics may be significant.

The success of these projects depends on the number of researchers involved, and for this reason we encourage anyone who might be interested to take part. More data are clearly required to characterize the long-term clinical course of this disease and to determine which of these clinical, functional, or radiological changes may be potentially reversible.

The pooling of 2 large respiratory studies, CIBERESUCICOVID and RECOVID, will provide valuable information for both healthcare professionals and patients. Generating knowledge is the best weapon we have to fight this situation that has altered our way of life and caused the loss of millions of lives. These new data will allow us to characterize the disease and develop new studies focused on resolving symptoms and long-term sequelae. COVID-19 has come to stay, and by constructing alliances to collect research data and forming multidisciplinary groups with a common objective, we are building a solid foundation for the future.

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