

## Protocol proposal to the initial assessment of the post-intensive care syndrome in COVID-19 patients, in an inpatient rehabilitation setting



### Propuesta de protocolo para la evaluación inicial del síndrome post-cuidados intensivos en pacientes de covid-19, en un entorno de rehabilitación hospitalaria

Dear Editor:

SARS-CoV-2 is a new coronavirus, first described in Wuhan, China.<sup>1</sup> This virus causes a contagious disease named COVID-19 that, in some cases, causes a severe acute respiratory syndrome.<sup>2,3</sup> The severity ranges from an asymptomatic infection or mild illness to a severe form, with pneumonia, acute respiratory distress syndrome (ARDS), other organ dysfunctions and the need of intensive care unit (ICU).<sup>3</sup> This disease was declared pandemic by the World Health Organization in March 11th 2020.<sup>2</sup>

We still have limited knowledge about outcomes and long term sequelae. The COVID-19 patients are at high risk to develop post-intensive care syndrome (PICS) – eventually similar to other causes of intensive care need<sup>4</sup> – mainly due to the prolonged periods of mechanical ventilation, sedation and the use of neuromuscular blocking agents.<sup>4</sup> The PICS has a negative impact in clinical and functional results.<sup>4-6</sup>

Some patients with PICS are considered eligible to integrate an inpatient and intensive rehabilitation program and are referenced from the inpatient acute hospital settings to our specialized rehabilitation center. We designed an evaluation protocol to assess these patients, in order to implement a structured intervention program and to collect data for future prospective and observational studies.

The collected data includes demographic information, social and family background and the past medical history, focusing on cardiovascular risk factors and the cardiovascular, respiratory, neurologic, endocrine and psychiatric disorders. We consider important to take into consideration the time until admission in the hospital and in the ICU, timing of nasopharyngeal SARS-CoV-2 tests and the time till admission in our unit. All important information regarding the ICU period is taken into account, namely in respect to respiratory support, mechanical ventilation or extracorporeal membrane oxygenation (ECMO) and weaning, as well as other organ dysfunctions and the need of other external supports.

At admission, we evaluate clinical symptoms. We address the skin, the nutritional status and the assessment of nutritional risk. The presence of dysphagia is screened by clinical evaluation in the first meal on the stay. For neurocognitive evaluation we use the Montreal Cognitive Assessment (MoCA), Hospital Anxiety and Depression Scale (HADS) for patients less than 65 years old or the Geriatric Depression Scale GDS and the Geriatric Anxiety Inventory (GAI) for patients older than 65 years old. Pain is evaluated through the Numeric Pain Rating Scale and DN4 Neuropathic Questionnaire.

At admission and at discharge, a complete neuromuscular and neurologic examination is performed. We also use the abbreviated version of the Balance Evaluation Systems Test (BESTest), the Sit To Stand Test, the Time Up and Go Test, the 6-minutes Walking Test, the Glittre ADL test, the London Chest Activity of Daily Living (LCADL), Multi-Independence Dimensions Questionnaire (MIND), the MOS Short Form Health Survey 36 Item v2 (SF-36V2) and the Fatigue Assessment Scale. Functional Independent Measure (FIM) is quantified. We perform a respiratory evaluation: respiratory muscle strength (maximum inspiratory pressure and maximum expiratory pressure), peak cough flow, morning gasimetric analysis and oxi-capnography.

All the patients are enrolled in an intensive rehabilitation program, coordinated by a physiatrist, including mainly physical, occupational, speech, language and swallowing therapy, rehabilitation nursing, nutrition and neuropsychology. The plan is an inpatient stay that includes treatments with a frequency of 5 days per week, divided in 2 periods of treatment per day (total of 4–5 h daily plus the time with rehabilitation nursing). Weekly discussions of the evolution and the need for adjustments of the program and its duration are made.

This approach aims to deliver an individualized program and to achieve high levels of treatment intensity. Based on a holistic view of the patient, the intensive program is designed to address the patient's altered domains in a coordinated work of a multiprofessional and interdisciplinary rehabilitation team.

We consider it is important to conduct prospective and comparable studies to follow these patients, to assess its clinical and the functional evolution and to accurately define functional prognosis. We present and open the discussion to the best approach to evaluate and prescribe the optimal treatment program of this population of patients. In the near future we will present the data of our prospective studies in these patients.

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