



COVID-19 Pandemic: A Physiotherapy Update

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ABSTRACT

Physiotherapists have an essential role in the recovery of patients who require hospital care and/or in intensive care units. However, so far, there is little discussion in literature about the interventions by physiotherapists together with multidisciplinary teams in hospital units that receive COVID-19 patients. In this perspective article, we discuss the role and importance of physiotherapy in the management of COVID-19 cases with focus on patients admitted to hospitals.

Keywords: coronavirus, rehabilitation, pandemics, physical therapists, hospitals, critical care

INTRODUCTION

Current data show that the total number of confirmed cases of coronavirus disease 2019 (COVID-19) due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the world exceeds 11,8 million cases, resulting in more than 543,558 deaths [1]. In some countries of the American continent, such as Brazil, confirmed cases of the disease have been growing seriously in a classic exponential curve and with a rapid daily rate, with more negative forecasts compared to European countries, like Italy and Spain [2]. Given the limited capacity of health systems to assist COVID-19 patients, it is essential in this context to flatten the epidemic curve of the disease in order to avoid possible overload and collapses in the health sector [2,3]. Moreover, the expansion of the COVID-19 pandemic in some countries has brought additional concerns, as in the case of Brazil, where, at the same time at least two more epidemics (dengue and influenza) have occurred [4,5].

Due to this situation, governments and public health authorities around the world have taken several decisions on an emergency basis in order to slow down the rise of new cases of COVID-19, as well as to decrease the number of related deaths. Initially, restricted measures, including social isolation, have been implemented in several countries with the aim of containing the rapid spread of the virus [2,6,7], which has undoubtedly generated various negative social, economic, and political impacts [8]. In this scenario, health systems are facing an abrupt increase in demand for intensive care, specifically aimed at preserving the lives of thousands of people with COVID-19 [7]. Thus, the existence of highly trained multidisciplinary teams in health units, following evidence-based recommendations, may be crucial for a better

management of the disease. Recent research suggests that physiotherapy team has an essential role in the recovery of patients who require hospital care and/or in intensive care units (ICU) [9]. However, so far, there is little discussion in literature about the interventions by physiotherapists together with multidisciplinary teams in hospital units that receive COVID-19 patients. Here, we discuss the role and importance of physiotherapy in the management of COVID-19 cases with focus on patients admitted to hospitals.

PHYSIOTHERAPY AND COVID-19 SPREAD

As COVID-19 spreads all across the world, the rehabilitation community had to respond to the challenges associated with this emergency. In a scenario characterized by no evidence of any effective treatment for COVID-19, a reorganization of the work and an adaptation of health care interventions were necessary. Predicting the disease from the symptoms onset was hard considering furthermore the fast contagion spread through a community transmission among human and through contact with contaminated environmental surfaces [10]. The real challenge has been responding and understanding how to prepare workplaces and to organize the clinical routines in order to receive potentially infected subjects. The rehabilitation community as well as the other professional health care providers have been called to optimize their clinical practice to face the COVID-19 diffusion [11]. Most countries around the world have seen COVID-19 cases and many are experiencing outbreaks of the disease. Because of that, the World Health Organization has provided countermeasures producing guidelines for the clinical daily life context [12].

ICU, in turn, is playing a vital role in this epidemic. With the aim of facing this emergency, entire hospital wards have been transformed in ICU to host patients requiring ventilatory care. The respiratory physiotherapy in ICU contributes to improve oxygenation in mechanically ventilated patients with severe acute respiratory failure or acute respiratory distress syndrome [13]. As it is known, COVID-19 patients can present a severe ventilation/perfusion mismatch, which could be overcome by positioning the patient in prone position [14]. In this connection, this treatment strategy also matters to the physiotherapist practice. Despite this, specific data supporting the rehabilitative care for ICU COVID-19 patients are lacking, and current recommendations are based only on existing evidence from other viral respiratory infections and general intensive care management.

It is therefore important to highlight the crucial role that physiotherapists have in the management of patients admitted with suspicion or confirmation of the disease in COVID-19 hospitals. Several countermeasures have been implemented in a recent publication sharing the guidelines and clinical practice recommendations in the hospital setting [15].

THE BENEFITS OF PHYSICAL THERAPY FOR ICU COVID-19 PATIENTS

Both trained respiratory and musculoskeletal physiotherapists are actively involved in the management of ICU COVID-19 patients. A series of clinical guidelines for the prevention and treatment of adult patients in ICU are currently present in literature, highlighting the importance of pain, agitation/sedation, delirium, immobility, and sleep disruption management [16]. The COVID-19 disease primarily affects the lungs, causing interstitial pneumonitis and severe acute respiratory distress syndrome. The acute hypoxemic patients may experience dyspnea, which can require the administration of oxygen flows. The benefits of pulmonary rehabilitation practice have been reported and they include the use of some devices, such as high flow nasal oxygen [17], application of continuous positive airways pressure (CPAP) [18], or non-invasive ventilation [19]. In addition, a potential rapid worsening of hypoxemia with the subsequent need of intubation and invasive mechanical ventilation has to be taken into account in patients affected by COVID-19 [20]. Thus, the role of the physiotherapist become also essential in a context where a huge number of patients required ICU hospitalization, and in several cases, the use of invasive mechanical ventilation. The main goals in this case are optimizing ventilation and oxygenation; improving compliance and ventilation/perfusion mismatch, reducing work of breathing; decreasing ventilator dependence and improving residual function; improving respiratory muscle strength and reducing complications [8]. The post-acute setting of the disease also represents an important issue to be better understood. The needs of the COVID-19 survivors may vary from a person to another and until now most of the information already published has been based in expert opinion papers, mostly from China or Italy [21]. Therefore, all the previously mentioned points in this manuscript should be of great importance for the recovery of COVID-19 patients [9].

Another critical topic in ICU COVID-19 patients has been discussed in a recent paper: the risk of thromboembolism [22]. Critically ill patients are at high risk of venous

thromboembolism because they combine both general risk factors together with specific ICU risk factors. The American Physical Therapy Association (APTA), in cooperation with the Cardiovascular & Pulmonary and Acute Care sections of APTA, provided in 2016 clinical practice guidelines to assist physiotherapists in their decision-making process, with an emphasis on patients at risk for venous thromboembolism or diagnosed with a lower extremity deep vein thrombosis [23].

Complementary to this, recent evidence supports the safety, feasibility, and benefits of early mobilization and rehabilitation of mechanically ventilated patients [24]. ICU-acquired weakness is an increasingly recognized problem, with sequelae that may last for months and years following discharge [25]. Furthermore, the combination of critical illness and bed rest results in substantial muscle wasting during an ICU stay. Shortly after the beginning of the mechanical ventilation, mobilization and rehabilitation can play an essential role in decreasing both the duration of mechanical ventilation and hospital stay, improving patients' return to functional independence. Active mobilization and rehabilitation in the ICU have no impact on short- and long-term mortality, but they may improve mobility status, muscle strength, days alive, and out of the hospital to 180 days [26].

Given the urgency and novelty of this pandemic, the rehabilitative care deserves particular consideration due to the potential impacts of mobilization and rehabilitative therapies on morbidity, mortality, duration of ventilation, and lengths of ICU/hospital stay.

THE POST-ACUTE PHASE OF THE DISEASE

Post-acute COVID-19 patients are considered individuals with a post-intensive care syndrome (PICS) resulting in the loss of functional independence. A recent study determined that ICU patients require 1-year recovery and healthcare use [27]. Besides, an increasing number of ICU patients have survived and developed psychological, cognitive, or physical impairment. As a result of the ICU stay, the recovery of COVID-19 patients with impaired respiratory and physical functions may take a long time after discharge, leading to a reduction in quality of life. COVID-19 survivors, particularly those who developed severe respiratory symptoms and had prolonged ICU stay, require rehabilitation care, because of their cardiorespiratory and musculoskeletal problems [28]. In this sense, one of the most essential aims of physiotherapists is to help patients to recover the ability to perform the daily life activities, developing different rehabilitation programs, depending on the severity of critical illness and individual goals [29]. Muscle wasting and weakness are significant contributors to PICS and are associated with greater disability, extended hospitalization, and increased post-ICU mortality making their management a challenge for the physical rehabilitation experts [30].

Physiotherapists, therefore, will have a key role in providing exercise, mobilization, and rehabilitation interventions to COVID-19 survivors in order to enable a functional return to home [31]. In view of this, the crucial importance of the rehabilitation has led to creation of innovative approaches during the pandemic. In this new scenario, inpatient rehabilitation populations became a more vulnerable group, so that the virtual care has been preferred in

relation to face-to-face interaction to avoid the infection spreading [32].

It is also worth mentioning, in this regard, that a position statement paper has defined the role of exercise on enhancing the immune function [33], promoting a global positive immune response. Based on these circumstances, it is fundamental to start an early rehabilitation right after the COVID-19 acute phase, to limit the severity of ICU-acquired weakness and promote a rapid functional recovery [34].

CONCLUSION

COVID-19 outbreak is the most important health emergency in recent decades, an event of exceptional magnitude, which has required the implementation of extraordinary countermeasures, ranging from the reorganization of the hospital network, to the quarantine of entire countries. There are many issues to be analyzed in this emergency. First of all, now it became clear that a robust public health care system, with solid prevention strategies, makes the difference in situations such as this. Preparations must focus not only on infrastructure and supplies, but also on staff, including protection from nosocomial transmission and promotion of mental wellbeing [35]. Many lessons can be learnt from the cumulative experience and the role of physiotherapy in this pandemic. In this sense, the work of physiotherapists may be beneficial in the respiratory treatment and physical rehabilitation of COVID-19 patients.

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