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Review article *Medical research*

Role of physiotherapy in improving respiratory and functional outcomes among COVID-19 survivors - Short communication

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Since December, 2019, an outbreak of a novel coronavirus disease was reported in Wuhan, China, which has subsequently affected 110 countries worldwide. In general, COVID-19 is an acute resolved disease but it can also be deadly, with a 3% case fatality rate. Severe disease onset might result in death due to massive alveolar damage and progressive respiratory failure. As of March 27, about 5 lakh cases have been confirmed and over 22,000 deaths. The ongoing outbreak has been declared by WHO as a global public health emergency. Infection estimated to have an incubation period of 2-14 days and a basic reproduction number of 2.24-3.58. [1-3] As of march 2020, only few relatively large-scale case studies have thoroughly demonstrated the clinical features of patients with pneumonia caused by SARS-CoV-2, clinical manifestations vary from pneumonia, fever was the most common symptom, followed by cough, dyspnoea, myalgia, headache, diarrhoea, rhinorrhoea, sore throat and pharyngalgia. 56.8% of patients had leukopenia. Radiological findings are variable. More than 75% of patients presented with bilateral lung involvement, and multilobe involvement was also common. Ground-glass opacity (GGO) with reticular and/or interlobular septal thickening with consolidation was the most common findings. [4-6] Majority of the cases resolved quickly and that of with co-morbid states required medical emergency, majority of deaths are because of complications and ARDS. Histological examination indicated bilateral diffuse alveolar damage with cellular fibromyxoid exudates. The lung showed evident desquamation of pneumocytes and pulmonary oedema with hyaline membrane formation. This results in a significant drop in perfusion and surfactant dysfunction as a result of fibrosis, indicating acute respiratory distress syndrome. [7, 8]

Varieties of early physiotherapy intervention in ICU are suggested by clinical research and should be applied according to the stage of disease, co morbidities, and patient's level of cooperation. Chest physiotherapy has been demonstrated to have metabolic, hemodynamic and respiratory effects. Early ICU physiotherapy is an interdisciplinary team activity, involving medical staff, nurses, physical therapists and occupational therapists. Prolonged stay in Critical Care Unit can cause muscle weakness, physical deconditioning, recurrent symptoms, mood alterations and poor quality of life. The aim of PT programs in critically ill should be to apply advanced cost effective interventions to improve recovery of physical and respiratory functions, veining off mechanical ventilation, effects of immobilisation, bronchial hygiene and improvement in the health status and quality of life. To manage these, integrated

programs dealing with both cardio pulmonary and other systems care is indicated.

In emergency setup, input from physiotherapy is often limited and minimal often due to the need for high PEEP and high oxygen requirements. However, present literature supports early mobilization as a safe and effective intervention that can have a significant impact on functional outcomes. [9] As it is an interstitial pathology secretions are not generally a problem. Treatment may consist of positioning, e.g. prone lying to optimise gas exchange. Caution is needed with hands-on techniques as you want to ensure you do not de-recruit lung units losing the splinting effect of the ventilator PEEP. In case of secretions, ensure adequate humidification along with other techniques (Manual hyperinflation, Percussion and vibrations (non acute cases), intrapulmonary percussive ventilation, mechanical insufflator-exsufflator) to improve bronchial hygiene and limb exercise, peripheral muscle training, Respiratory muscle training, Neuromuscular Electrical Stimulation and an integrated pulmonary rehabilitation programme. [10] Survival of critically ill patients is frequently associated with significant functional impairment and reduced health-related quality of life. Early physiotherapy of critically ill patients has recently been identified as an important therapeutical tool and has become an important evidence-based component in the management of these patients. Nevertheless, availability and quality of physiotherapy performed in intensive care units (ICUs) is often inadequate. Physiotherapists are having a vital role in building up the functional and respiratory capacity of the survivors worldwide, helping to improve quality of life and productivity across the globe.

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