

Practice Recommendations for the Physiotherapy in a Pediatric Intensive Care Unit: COVID-19

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Coronavirus is a new virus, the lack of immunity in the population means that COVID 19 has the potential to spread extensively. The current data seem to show that we are all susceptible to catching this disease, which includes, patients and healthcare staff (1).

The COVID-19 in children is often less severe than in adults. It is believed Children were usually well cared for at home and might have relatively less opportunities to expose themselves to pathogens and/or sick patients. The angiotensin converting enzyme II (ACE2) is known as a SARS-CoV-2 /receptor and evidence has indicated that these receptors in children have less maturity and function than in adults. Making children less sensitive to the virus (2-4).

The COVID-19 is a systemic disease that primarily injures the vascular endothelium, according to recently published literature the evaluation of imaging exams of the most severe cases is of great relevance. The typical radiographic image when examining the chest tomography of pulmonar involvement is parenchymal destruction expressed as multiple bilateral ground-glass opacities and pulmonary consolidations. In children with severe infections, multiple lobar lesions may be present in both lungs (5-7).

Caring for children with COVID-19 will require careful

considerations in clinical care, staffing and isolation requirements, and all PICUs should be prepared for these possibilities (8).

The use of non-invasive ventilation and high-flow nasal cannula is recommended in children with mild disease. However, the guidelines suggest use in negative pressure rooms to reduce the risk of droplet aerosolization (8).

In pediatric patients on invasive mechanical ventilation, the use of the Oxygenation Index (OI) $[(OI= MAP \times FiO_2 \times 100 / PaO_2)]$, is ideal index for the classification of pediatric ARDS severity. The oxygenation index uses the mean airway pressure (MAP), oxygen fraction (FiO_2) and partial oxygen pressure in arterial blood (PaO_2). The degree of lung injury is classified as: mild acute respiratory distress syndrome (ARDS) ($4 < OI < 8$), moderate ARDS ($8 < OI < 16$) and severe ARDS ($OI > 16$) (9-14).

The strategy of monitoring and control of drive pressure at values $\leq 15 \text{ cmH}_2\text{O}$ with plateau pressure limited to $28 \text{ cmH}_2\text{O}$ becomes extremely important. These measures could avoid new damage to an already damaged lung (10-12). Physiotherapeutic assistance to patients diagnosed with COVID-19 must follow four fundamental principles: early identification, isolation, diagnosis and treatment.

Besides that, it is important to establish and describe the new strategic of work process flow and training step by step the safety of this new process (15-20).

Physiotherapeutic procedures can be considered high risk when they include aerosol-generating, such as: aspiration of the airways, collection of secretion from the upper airways, the aid during of tracheal intubation and cardiorespiratory arrest maneuvers. It is important to remember even direct handling of the patient for positioning, elective tracheal extubation, change of the barrier filters and adjustment/fixation of tracheal tube are procedures of risk (15-19).

It is important to remind that during intensive medical treatment of these patients even using protective pulmonary ventilation, sedation and neuromuscular blockers, this patients are at high risk of developing muscle weakness acquired in the ICU and consequently worsening their morbidity and mortality (20,21).

Perspectives

At this time, teamwork and collaboration are more important than ever within our own profession and interprofessionality, effective and compassionate communication is essential.

A prepared, motivated and experienced team can directly influence the success of the treatment of COVID-19. The objectives must be well established, with treatment methods based on the best evidence combined with the domain of different technologies. Beyond the acute stage of disease the Physiotherapy will play a important role providing interventions with exercises, mobilization and early rehabilitation. This way, it will be possible to promote a functional recovery for survivors of critical illness associated with COVID-19.

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