



Feasibility of pulmonary physiotherapy in pediatric patients with COVID-19

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Key point

Physiotherapy services especially for lung organs in COVID-19 wards provide the recovery of people's movement, functional ability, and improving their quality of life.

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Although SARS-CoV-2 known internationally as coronavirus disease 2019 (COVID-19) affects a significant proportion of people, it has been reported less frequently in pediatrics, especially in the initial studies, in which only 0.9% of the positive cases involved children (1). Primary reports about the COVID-19 outbreak in children were misleading as most infected children that are asymptomatic (2,3). What is commonly said about child infection is that children are less likely to be infected and less likely to be admitted to intensive care units (4). However, on 14th May 2020, the Centers for Disease Control and Prevention (CDC) released a health advisory reporting a multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19 (5).

Despite the lower incidence and severity of the disease in children, it should be borne in mind that children usually do not cover their faces during coughing and sneezing. They constantly touch their faces and make physical contact with their other teammates and peers. All these things make children less careful of healthy behavior. It should also be noted that the reopening of schools can also be a ground for further spread of the disease. The most common clinical manifestations were fever (59.1%), cough (55.9%), rhinorrhea (20.0%), and myalgia/fatigue (18.7%). Unlike adults, children rarely progressed to severe upper

respiratory symptoms requiring intensive care unit admission (6). Studies show that the cause of low-grade lung injury is probably due to differences in pathoimmunological, mediators necessary for viral entry and immune system-mediated response (7).

Low incidence and severity should not mean less attention to this age group. Hoang et al reported lots of children without specific symptoms (8).

What is most striking is that COVID-19 is not just a pulmonary disease but one with a pulmono-cardio-hematological-endothelial-inflammatory consequence, unlike any other viral pneumonia that has been reported thus far. Physiotherapy services in COVID-19 wards provide the development, maintenance, and recovery of people's movement, functional ability, and improving their quality of life (9).

Possible actions of a pediatric physiotherapist in this current crisis may include identifying suspects, educating children and caregivers, postural drainage (to decrease secretions and improve breathing control), pulmonary rehabilitation, vocational training, and early mobilization as soon as possible.

Evaluation of physical therapy in children with COVID-19 must include not only a comprehensive assessment of the respiratory status but should also determine the child's general physical condition such as the strength

of musculature, mobility of the thorax, and whole body, endurance, and general physical activity. Additionally, respiratory muscle function both strength and endurance, musculoskeletal mobility, bronchial hygiene, and pattern of breathing should be assessed carefully.

It should also be noted that physiotherapy is not limited to managing the current condition of the child, and most hospitalized children have underlying diseases such as tumors, cardiopulmonary and kidney diseases. Children admitted to intensive care units are prone to acquired muscle weakness. Functional restrictions are usually imposed on the child to physically protect him or her from falling. Play therapy, as a form of therapy in children, is one of the main role of physiotherapy to increase the range of motions in the joints, strength, breathing capacity, cardiovascular tolerance during work out resulted in favorable pulmonary function. The physiotherapists should be aware that aerosol-generating procedures are not limited to intubation and suction, however close contact with the child during actions such as positioning, play therapy, and ambulation can also be dangerous.

There are many differences in respiratory structure and function of pediatrics compared to adults that require continuous modification in the application of the respiratory physiotherapy techniques according to age. Techniques include postural drainage, percussion, and vibrations (manual techniques), manual hyperinflation, active cycle of breathing, oscillatory positive expiratory pressure (PEP), autogenic drainage, assisted autogenic drainage, forced expiration, slow and prolonged expiration, increased expiratory flow, total slow expiration with the glottis open in a lateral posture, and inspiratory controlled flow exercises, instrumental techniques and incentive spirometer. Specialization of physiotherapy intervention plans based upon assessment and reassessment is crucial in children (10).

Authors' contribution

PA, AE and SMAH contributed to conception and design, literature search, writing and editing of the manuscript.

Conflicts of interest

The authors declare no conflict of interest regarding the publication of this article.

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