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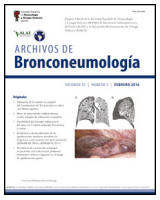

Letter to the Editor

Swimming Exercise for Patients With Long-Term Respiratory Post COVID-19 Complications: Further Thinking on the Pulmonary Rehabilitation

La natación en pacientes con la condición post COVID-19 persistente: Una nueva perspectiva en la rehabilitación pulmonar

Dear Editor,

Swimming is an aquatic sport in which the propulsion is coordinated with respiratory phases, consisting in underwater apnoeas interspersed with rapid and deep inhalations out of the water. This breathing pattern provokes those aquatic athletes have higher lung volumes and lung diffusing capacities than other athletes and general population.[1]

The SARS-coronavirus-2 disease 19 (COVID-19) has put the respiratory health in the spotlight. Some factors, as advanced age, and obesity has been correlated with a higher risk of hospitalization and mortality. On the other hand, exercise capacity has been reported as a positive factor to reduce the clinical impact of COVID-19 infection.

The benefits of physical exercise over human being health have been extensively described. However, the structural and functional properties of the lungs do not change significantly due to training, except for aquatic athletes. Swimming involves both locomotor muscles as respiratory muscles, which may be combined to offer a complete pulmonary fitness program. Why do not translate these benefits to the pulmonary rehabilitation (PR) programs based in physical exercise?

Three months after hospital discharge, patients with COVID-19 still present lung function abnormalities with a 25–57% of the patients showing carbon monoxide lung diffusion capacity (DL_{CO}) < 80% of reference, confirming that survivors of COVID-19 may suffer lung function sequalae.[2]

For patients with COVID-19, PR is aimed at relieving symptoms of dyspnoea, psychological distress and improving the functional status. Exercise training is considered the foundation of PR and it is included in most of the rehabilitation programs. Some of the current guidelines relative to management of COVID-19 convalescent people only propose walking or cycling activities, being the potential benefits of swimming still misunderstood, unknown, and lacking research.

Conventional PR programmes rely on general principles of exercise physiology: (duration, intensity, and frequency), but the impact of exercise modality is not considered. Some specific attributes of swimming may stimulate thoracic expansion and increased gas diffusing capacity, such as horizontal aerobic exercise, water hydrostatic pressure, and forced submaximal inspirations.[3]

Our hypothesis is that different exercise modalities may trigger different rehabilitation results, based on the biomechanical and physiological attributes of each locomotion mode. At this moment, swimming exercise has not been utilized as a PR modality, in comparison with the classical rehabilitation methods, such as respiratory muscle training and walking exercise. Some studies on COPD patients have used water-based exercise, but only focused on a combination of strength exercises and mobility in the water (*aqua-gym*).[4]

As far as we know, no studies have been conducted using swimming as a rehabilitation exercise method. The main reason could be the difficulty of getting access to a swimming pool. Also, swimming biomechanics is more difficult to master than walking or cycling, and it demands a multidisciplinary work between medical doctors and exercise trainers. Besides, some patients may feel a discomfort feeling with their face underwater since patients recovering from COVID-19 present respiratory complications with augmented exercise ventilation.[5]

However, especially for those with previous experience, swimming exercise may be a valuable rehabilitation method. Future studies must explore this paradigm, comparing different exercise modalities to evaluate the efficacy of the existing PR programs.

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