Swimming: An Alternative Exercise for Respiratory Strengthening and Improvement

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Swimming exercise is known to have an acute adverse effect on respiratory muscle strength and respiratory function. It is thought to be the result of tiredness because of the negative effect. It is thought that the increased muscle temperature, decreasing pH, and both intramuscular and blood hemostasis along with fatigue are associated with acidosis and decreases in the ability of the respiratory muscles to decrease with performance and negative effects of respiratory functions [1-5]. The fatigue in the respiratory muscles is due to metabolic changes due to peripheral. It can occur even in a short-term event [4,6,7]. Muscle fatigue affects motor performance negatively. The main reason for this is the decrease in the activity of contractile proteins [8]. The effect of respiratory muscles may also affect respiratory functions [9]. Fatigue in respiratory muscles may affect motor performance [10] and may also affect respiratory function. It can be said that the amount of oxygen that cannot meet the inadequate blood and metabolic requirements for the activity in the respiratory muscles, may affect the respiratory ability of the respiratory muscles [11-14]. In addition, the physiological mechanisms of the result obtained when the acute swimming exercise narrows the airways due to water pressure [15] and the respiratory stress factor [16] can be explained in this way.

On the other hand, swimming has proven to be of chronic benefit to respiratory mechanics. Especially swimmers are the group with the highest values among the athletes as respiratory capacity [17]. Difficult breathing parameters depend on the performance of the respiratory muscles of the thorax and abdominal muscles. Swimming is very effective on the muscles of this region because the body performs in the horizontal position in contrast to other vertically performed spores. This position benefits from the important respiratory muscles (e.g. Diaphragm, m. Trapezius, m. Sternomastoid, m. intercostalis interni/externi), as well as the m. erector spinae and m. supraspinatus muscles. In this way, swimming exercise naturally causes breathing mechanism to heal [18]. In addition, ventilation is limited during swimming training and this causes an intermittent hypoxia. This hypoxia starts the anaerobic process and the lactic acid begins to mix into the blood. This process is perceived by the respiratory center in the medulla oblige to increase ventilation. Alveolar hyperplasia [19] is the cause of chronic increase in FVC, FEV1 and VC respiratory parameters when exercise is chronic. However, increased respiratory muscle strength is considered as the main reason for the increase in challenging respiratory parameters.

In addition, the swimming provides a high external pressure to the thorax region. This is the most important respiratory muscle m. Since diaphragm provides respiratory mechanics against increased pressure; it becomes a resistance exercise for diaphragm. The functional capacity of the respiratory muscles increases with this resistance exercise [17,18,20-22]. In addition, thermal conductivity of water is higher than air [23]. Regular swimming training increases the elasticity of the lungs and chest wall, leading to improved respiratory function [17,18,20,21].

When all the factors mentioned above are combined, swimming exercise can play an important role as an alternative exercise in the recovery of respiratory functions and respiratory muscles.

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