ECRONICON OPEN ACCESS

EC PULMONOLOGY AND RESPIRATORY MEDICINE

Commentary

Swimming: An Alternative Exercise for Respiratory Strengthening and Improvement

Mustafa Özdal*

Lab of Gaziantep University Performance Laboratory, Department of Physical Education and Sport, Gaziantep University, Gaziantep, Turkey

***Corresponding Author:** Mustafa Özdal, Lab of Gaziantep University Performance Laboratory, Department of Physical Education and Sport, Gaziantep University, Gaziantep, Turkey.

Received: April 23, 2019; **Published:** September 16, 2019

Swimming exercise is known to have an acute adverse effect on respiratory muscle strength and respiratory function. It is thought to be the luck 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.

Bibliography

1. Dolan P., *et al*. "Effect of active and passive warm-up on maximal short-term power output of human muscle". *The Journal of Physiology* 365 (1985): 74.

2. Grodjinovsky A and Magel JR. "Effect of warming-up on running performance". *Research Quarterly for Exercise and Sport* 41.1 (1970): 116-119.

3. McKenna MJ., *et al*. "Tests of anaerobic power and capacity". *Australian Journal of Science and Medicine in Sport* 19.2 (1987): 13-17.

4. Pachecco BA. "Improvement in jumping performance due to preliminary exercise". *Research Quarterly for Exercise and Sport* 28.1 (1957): 55-63.

5. Bostanci Ö., *et al*. "Inspiratory muscle training improves pulmonary functions and respiratory muscle strength in healthy male smokers". *Respiratory Physiology and Neurobiology* 264 (2019): 28-32.

6. Gandevia SC. "Spinal and supraspinal factors in human muscle fatigue". *Physiological Reviews* 81.4 (2001): 1725-1789.

7. Bizid R., *et al*. "Effects of knee and ankle muscle fatigue on postural control in the unipedal stance". *European Journal of Applied Physiology* 106.3 (2009): 375-380.

8. Lundin TM., *et al*. "Effect of plantar flexor and dorsiflexor fatigue on unilateral postural control". *Journal of Applied Biomechanics* 9.3 (1993): 191-201.

9. Enoka RM and Stuart DG. "Neurobiology of muscle fatigue". *Journal of applied physiology* 72.5 (1992): 1631-1648.

10. Özdal M. "Acute effects of inspiratory muscle warm-up on pulmonary function in healthy subjects". *Respiratory Physiology and Neurobiology* 227 (2016): 23-26.

11. Özdal M. "Influence of an eight-week core strength training program on respiratory muscle fatigue following incremental exercise". *Isokinetics and Exercise Science* 24.3 (2016): 225-230.

12. Özdal M. "Acute effects of aerobic and two different anaerobic exercises on respiratory muscle strength of well-trained men". *European Journal of Sport and Exercise Science* 4.4 (2015): 7-12.

13. Harms CA., *et al*. "Effects of respiratory muscle work on exercise performance". *Journal of Applied Physiology* 89.1 (2000): 131-138.

14. Mostoufi-Moab S., *et al*. "Forearm training reduces the exercise pressor reflex during ischemic rhythmic handgrip". *Journal of Applied Physiology* 84.1 (1998): 277-283.

15. Hobo S., *et al*. "Characteristics of respiratory function during swimming exercise in thoroughbreds". *Journal of Veterinary Medical Science* 60.6 (1998): 687-689.

16. Armario A., *et al*. "Influence of various acute stressors on the activity of adult male rats in a holeboard and in the forced swim test". *Pharmacology Biochemistry and Behavior* 39.2 (1991): 373-377.

17. Mehrotra PK., *et al*. "Pulmonary functions in Indian sportsmen playing different sports". *Indian journal of physiology and pharmacology* 42.3 (1998): 412-416.

18. Gupta SS and Sawane MV. "A comparative study of the effects of yoga and swimming on pulmonary functions in sedentary subjects". *International Journal of Yoga* 5.2 (2012): 128-133.

19. Gopal KS., *et al*. "Effect of yogasanas and pranayamas on blood pressure, pulse rate and some respiratory functions". *Indian Journal of Physiology and Pharmacology* 17.3 (1973): 273-276.

20. Pherwani AV., *et al*. "A study of pulmonary function of competitive swimmers". *Indian Journal of Physiology and Pharmacology* 33.4 (1989): 228-232.

21. Lakhera SC., *et al*. "Pulmonary function of Indian athletes and sportsmen: comparison with American athletes". *Indian journal of physiology and pharmacology* 28.3 (1984): 187-194.

22. Yılmaz ÖF and Özdal M. "Acute, chronic, and combined pulmonary responses to swimming in competitive swimmers". *Respiratory Physiology and Neurobiology* 259 (2019): 129-135.

23. Bowen IS. "The ratio of heat losses by conduction and by evaporation from any water surface". *Physical review* 27.6 (1926): 779.

Volume 8 Issue 10 October 2019