Association of Blood Redox State and Exercise

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Review Article
An Approach to Available Literature about Association of Blood Redox State and Exercise

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ABSTRACT

Imbalance between reactive oxygen species (ROS) and antioxidants is termed as oxidative stress. Although low level of ROS are considered beneficial and important for normal functioning of cells. This research study review the available literature about exercise with various intensities and blood redox state. In this regard, data from 2015 to 2022 were collected from different search engines including PubMed, Web of Science, Scopus and Google scholar. The collected data were analyzed through qualitative data analysis technique and thus the researcher arrived at conclusion that exercise with moderate intensity having beneficial effects on blood redox state as compared to high intensity exercise.

INTRODUCTION

Physical activities with moderate volume and intensities promote the functional capacities of whole body systems. Physical activities with high volume and intensities effect the resistance capacity of the body against oxidative stress [1]. Oxidative stress refers to imbalance state of ROS and antioxidants. In sedentary as compared to active people, level of oxidative stress is found high [2]. Physical activeness reduce the antioxidant capacity and induce the rise of ROS which cause oxidative stress and thus it effect the physiology of various body systems. To strengthen the functional capacity of antioxidant defense mechanism, exercise with sufficient volume and intensities are encouraged. Exercise has positive association with oxidative stress and cardiovascular risk factors such as blood pressure, body mass index and fats percentage in postmenopausal women [3]. Regular exercise and antioxidant supplementation having more favorable effects on physical function and resistance to oxidative stress and thus its helps in reducing cardiovascular health complications [4]. Different studies shown that high intensity exercise increase the production of Reactive oxygen and nitrogen species (RONS) that cause several damages to Lipid, DNA, and protein oxidation in blood cells. High level of RONS may cause cardiovascular problems, problems of immune system and increase the risk of some cancers. Regular exercise helps in reduction of RONS by strengthening the antioxidants capacity of the body [5]. High intensity exercise performers as well as heavy
Participants: Twenty volunteers (10 males, 10 females) were randomly divided into two equal groups based on their physical fitness level. One group performed low-intensity exercise (60% of VO2max) for 60 minutes, while the other group performed high-intensity exercise (80% of VO2max) for 40 minutes. Both groups maintained a constant speed of 10 km/h.

Results: After the exercise, the blood redox state was analyzed in both groups. The results showed that high-intensity exercise led to a significant increase in oxidative stress (increase in ROS) and a decrease in antioxidant capacity compared to low-intensity exercise. However, both groups showed a significant increase in antioxidant capacity over the course of the study, indicating a possible adaptation to the exercise regimen.

Conclusion: The study concluded that while high-intensity exercise can lead to oxidative stress and decrease in antioxidant capacity, low-intensity exercise can also improve the antioxidant capacity over time, making it a beneficial alternative for individuals with chronic diseases.

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