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Editorial Open Access

Effects of Strenuous Physical Exercises on Blood Redox Status and Muscle Damages among Trained and Untrained Individuals

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Editorial

Several studies suggest that unaccustomed and exhaustive physical exercises could increase the production of reactive oxygen and nitrogen species (RONS) that cause several damages such as lipid, DNA and protein oxidation in blood as well as other cells. High levels of RONS could also play a major role in cardiovascular dysfunction, impair the immune system, reduce immune-surveillance and increase the risk of some cancers. Nevertheless, regular physical training could mitigate such adverse effects, improve health, and protects the integrity of many organs by increasing antioxidant potential and decreasing the production of RONS. These studies were carried out either using aerobic exercise among endurance athletes vs untrained subjects, or from anaerobic exercise among sprinters vs sedentary subjects, however, there is little information available regarding the effects of both aerobic and anaerobic exercise on the redox status and muscle-damage biomarkers in athletes of different sports disciplines.

Moreover, even studies having investigated such effects, none of them has delimitated the organism's responses in the same athletes, notably, when the practiced exercise-test differed from their sports specialty. Results of our studies noted that maximal physical exercise (100% of maximal aerobic speed (MAS)) increases the immunity cells' circulation as lymphocytes, monocytes and neutrophils, serum concentrations of muscle damages biomarkers as creatinine kinase (CK), lactate dehydrogenase (LDH) and myoglobin (Mb), and proinflammatory cytokines [1,2] as IL-1β, IL-6 and TNF-α in trained and untrained subjects. Our findings indicated also that maximal and supra-maximal race events, when sustained until exhaustion, induced significant modifications in blood redox balance reflecting the production of a significant oxidative stress in long-distance runners (LDR), middle-distance runners (MDR) and sedentary subjects (SS).

It is also noted that the training state and the sportive specialty produced different effects on the level of the oxidative stress. Malondialdehyde (MDA) concentration, total antioxidant status (TAS), and catalase (CAT) activity were lower in LDR and MDR at the end of the maximal and the supra-maximal event, respectively [3]. These events also induced muscle damage manifested by increased CK, LDH and myoglobin concentrations, and a non-specific inflammatory response manifested by elevated concentrations of serum TNF-α and IL-6. Furthermore, athletes showed a lesser magnitude of changes in the cytokines levels, than sedentary subjects. Neither the type of the test performed nor the sportive specialty affected recorded values among athletes.

References

1. Said M, Feki Y, Hamza M, Machghoul S, Amri M (2005) Effects of two kinds of exhaustive maximal exercise on pro-inflammatory cytokines concentrations in trained and untrained humans. Biology of Sport 22: 329-339.
2. Said M, Feki Y, Aouni Z, Machghoul S, Hamza M, et al. (2009) Effects of sustained intensive physical activities on immune cells circulating and pro-inflammatory cytokines production in trained and untrained humans. Science & Sports 24: 229-237.
3. Said M, Ncir L, Mansour H (2015) Effect of maximal versus supra-maximal exhausting race on lipid peroxidation, antioxidant activity and muscle-damage biomarkers in long-distance and middle-distance runners. Asian J Sports Med Inpress(Inpress): e27902.