Abstract

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Biochemical evaluation of antioxidant function after a controlled optimum physical exercise among adolescents.

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BACKGROUND: Sensible physical exercise is shown to prevent certain neurovascular problems. However, in recent times, non-traumatic sudden death in young athletes has been observed and the incidence level is always very disturbing, because of the spontaneous nature of the occurrence. It most commonly occurs fivefold more in male than female athletes. Although it is believed that congenital cardiovascular disease is the leading cause of non-traumatic sudden athletic death, however, sudden physical alteration in the biochemical composition of the body system may, at least in part, play an important role.

OBJECTIVE: The role of antioxidants in the general maintenance of homeostasis has already been established. In this study, total antioxidant function in athletes subjected to controlled physical exercise was evaluated to determine the extent to which intensive physical exercise could alter the health conditions if adequate actions are not taken to adjust the biochemistry of the body system.

METHODS: Ten male field-track athletes were exercised using a fixed workload treadmill test. Blood samples were drawn before and after the exercise. The subjects exercised almost to their maximum running distance at a higher "fatigue" workload for a maximum of 20 min each day for five days. The lymphocytes' total antioxidant function was measured by addition of a peroxide (oxidative stress) to complete the medium. Lymphocyte growth response with peroxide was reported as a percentile of growth responses from a reference range of apparently healthy individuals. Values below the 25th percentile indicate a deficient antioxidant function.

RESULTS: The results showed that although vitamin B3, B6, and B12 requirements were normal, there was a consistent low value in the total percentile of vitamins B1 (<79%), B2 (<54%), folate (<33%, and biotin (<70%). There was a dramatic decrease in the mean values of antioxidant function (38.1%) in all the subjects as opposed to the reference range of <75%.

CONCLUSION: Overall reduction antioxidant function indicates decreased ability to resist oxidative stress, or an increased oxidant load, suggesting increased antioxidant utilization and/or cellular "tear and wear" scenario. It is therefore suggested that after intensive physical exercise, antioxidant functions should be monitored and supplemented whenever necessary to maintain the integrity of the cellular function.

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