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©Journal of Sports Science and Medicine (2004) 03, 64 - 69

Review article

High Altitude and Free Radicals

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Received: 15-04-2004 -- Accepted: 10-05-2004 -- Published (online): 01-06-2004

ABSTRACT

High altitude exposure results in decreased oxygen pressure and an increased formation of reactive oxygen and nitrogen species (RONS), which is often associated with increases in oxidative damage to lipids, proteins and DNA. Exposure to high altitude appears to decrease the activity and effectiveness of antioxidant enzymes system. Moreover, during high altitude exposure several RONS generating source are activated, including mitochondrial electron transport chain, xanthine oxidase, and nitric oxide synthase (NO). Physical exercise at high altitude can further enhance the oxidative stress. The available information suggests that RONS are involved and are even a causative factor of acute mountain sickness. Supplementation of antioxidant seems to be a necessary step to prevent or decrease to high altitude exposure associated oxidative stress.

Key words: High altitude, reactive oxygen and nitrogen species, oxidative stress, oxidative damage, antioxidants, acute mountain sickness

Key Points

- Reactive oxygen and nitrogen species
- High altitude-induced oxidative stress
- Antioxidant down regulation by altitude
- Exercise and altitude associated oxidative stress

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Tibor Bakonyi,
 Zsolt Radak
 (2004) High
 Altitude and
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*Journal of
 Sports Science
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 (03), 64 - 69



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