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The effect of methyl sulphonyl methane supplementation on biomarkers of oxidative stress in sport horses following jumping exercise.

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Abstract

BACKGROUND: Exercise induces changes in several organs and tissues, and this process might be due to oxidative damage caused by free radicals and inflammatory mediators. Methyl Sulphonyl Methane, better known as MSM, is a naturally occurring sulphur compound with well-known antioxidant properties. On the other hand, Vitamin C is important in limiting free radical damage in the aqueous phase of the cell, and cellular vitamin C status may be linked to the mechanisms involved in quenching cellular reactive oxygen species. The aim of this study was to determine if supplementation with MSM and vitamin C could alleviate exercise-induced oxidative stress in horses undergoing jumping competition.

METHODS: Twenty four jumping horses involved in competition were used. Horses were given the following three treatment diets: control (without supplementation), MSM 8 mg/kg, and combined supplements (MSM 8 mg/kg + Vit-C 5 mg/kg). EDTA blood samples were collected before exercise, upon arrived to the schooling area (control), and each week after last show. Nitric oxide, carbon monoxide, lipid hydroperoxides and the antioxidant enzymes, glutathione peroxidase, glutathione transferase and glutathione reductase, plasma levels were determined.

RESULTS: Competition induced a significant increase in lipid peroxidation, nitric oxide and carbon monoxide. By contrary, reduced glutathione as well as antioxidant enzyme activities, were decreased. MSM administration significantly ameliorated all these exercise-related changes, and this effect was potentiated by Vit C reaching values in some of the parameters similar to those found before competition.

CONCLUSION: These results suggest that jumping exercise could induce harmful effects on horses, probably due to an increase in oxidative damage and proinflammatory molecules. In addition, we have demonstrated that MSM could exert some protective effect on oxidative and inflammatory exercise-induced injury.

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