

Simulated weightlessness down-regulated antioxidant defense system in rats

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Abstract: A variety of experiments suggest that space flight is associated with an increase in oxidative stress in organism. The aim of the present study is to investigate whether or not simulated weightlessness by tail-suspension can affect the antioxidant defense system in rats and the possible protection effects of Chinese medicine named Liu Wei Di Huang Wan (LWDHW). Blood plasma of rats was taken after 21 days of tail-suspension for the assessment of the change of antioxidant defense system. The total antioxidant capacity (T-AOC) was significantly decreased and the content of malondialdehyde (MDA) was increased after simulated weightlessness. Activities of antioxidant enzymes, such as superoxide dismutase and catalase, were lower than those in the controlled groups. However, the activity of glutathione peroxidase was increased in comparison with the controlled groups. Adequate dosage of LWDHW could inhibit the production of MDA and improve T-AOC in tail-suspension rats. These results suggested that tail-suspension might break the oxidative/antioxidative balance and down-regulate antioxidant defense system, and Chinese medicine LWDHW was shown to protect rats from oxidative damage during simulated weightlessness.

Key words: Simulated weightlessness; Tail-suspension; Antioxidant defense system; Rats