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Antifatigue effects of peptide isolated from sheep placenta

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ABSTRACT

Objective: Fatigue has become one of the major threats to human health in the 21st century. Traditional Chinese medicine (TCM), which proved to be safer and more effective, has become a hot spot in antifatigue research. Human placenta, also called "Ziheche", has drawn great attention in the antifatigue effect since the Tang dynasty. However, the shortage of human placenta restricts wide usage of it. According to the theory of TCM, sheep placenta (SP) also has the effect of nourishing blood, tranquilization, nourishing skin, and prolongation of life. The aim of this study was to examine the antifatigue effects of sheep placenta peptide (SPP), an extract of sheep placenta, in mice and the mechanism was also studied.

Methods: Peptide from fresh SP was extracted via enzymolysis. SPP (0.13 g/kg) and soybean peptide (0.65g/kg) were administrated orally and daily to mice for four weeks. Antifatigue effects of SPP were estimated on weight-loaded swimming test; A non-weight-loaded swimming test was conducted to elucidate underlying the mechanisms of the anti-fatigue effects.

Results: Administration of SPP prolonged the weight-loaded swimming time in mice. In addition, SPP significantly decreased the levels of muscle malondialdehyde (MDA) and serum lactic acid (LD), and increased the activities of muscle glutathione peroxidase (GSH), and superoxide dismutase (SOD) and liver glycogen in mice after non-weight-loaded swimming test. Moreover, the electron microscope observation showed that the muscle fiber bundle ranked neatly, the H band, I band, Z line as well as M line were clear and the numbers of mitochondria was normal though some of the mitochondria were swell in SPP treated mice after non-weight-loaded swimming test.

Conclusion: SPP possesses potent abilities for antifatigue; Increasing the anti-oxidant activities and energy reserve as well as improving the ultrastructures in gastrocnemius muscle cells, which may be the mechanisms of SPP exerting its antifatigue effects.

Keywords: antifatigue; anti-oxidant; sheep placenta peptide

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