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Effects of Silk Fibroin on Oxidative Stress and Membrane Fluidity in Brain of SD Rats

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This study was designed to investigate the effects of silk fibroin powder (Mw 500) on oxidative stress and membrane fluidity in brain membranes of rats. Sprague-Dawley (SD) male rats ($160 \pm 10g$) were fed basic diet (control group), and experimental diets (SFP-2.5 and SFP-5.0 groups) added 2.5 and 5.0g/kg BW/day for 6 weeks. Cholesterol level was significantly decreased about 8.0% in brain microsomes of SFP-5.0 group only compared with control group. Membrane fluidities were significantly increased (12.9% and 15.2%, respectively) in brain microsomes of SFP-2.5 and SFP-5.0 groups, but significant difference between in brain mitochondria of these two groups could be not obtained. Basal oxygen radicals (BOR) in brain mitochondria and microsomes were significantly inhibited (10.4% and 24.0%, 7.9% and 14.9%, respectively) by SFP-2.5 and SFP-5.0 groups compared with control group. Induced oxygen radicals (IOR) in brain mitochondria and microsomes were significantly inhibited (11.8% and 14.1%, respectively) by SFP-5.0 groups compared with control group compared with control group.

Lipid peroxide (LPO) levels were dose-dependently decreased (12.9% and 21.9%, 13.2% and 22.5%, respectively) in brain mitochondria and microsomes of SFP-2.5 and SFP-5.0 groups compared with control group. Oxidized protein (OP) levels were significantly decreased (15.7% and 17.1%, 16.7% and 15.7%, respectively) in brain mitochondria and microsomes of SFP-2.5 and SFP-5.0 groups compared with control group. These results suggest that administration of SFP may play an effective role in a attenuating a oxidative stress and increasing a membrane fluidity in brain membranes.