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Effect of exercise and Siyeshen upon hippocampal cytochrome c and caspase-3 of diabetic rats

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Objective To observe the effects of aerobic exercise and Siyeshen water extract on cytochrome c (Cyt c) and caspase-3 in hippocampus of diabetic rats and to explore the possible mechanism of improving diabetes.

Methods Healthy male Wister rats fed with high fat and high sugar and combined with streptozotocin to establish type II diabetes model. They were randomly divided into 4 groups: diabetic control group, exercise group, Siyeshen group and exercise+Siyeshen group, and another normal control group, with 6 rats in each group. After aerobic exercise (15m/min, 5°slope, 60min, every other day) or/and Siyeshen (200mg/kg) gastrointestinal administration for 8w, the expression of Cyt c and caspase-3 in hippocampus of each group were detected by immunoblotting, and mRNA expressions were detected by RT-PCR.

Results Compared with the normal control group, the mRNA and protein expressions of Cyt c and caspase-3 in the hippocampus of the diabetic control group were significantly increased ($P < 0.05$). Compared with the diabetic control group, the blood glucose level of exercise group and exercise+Siyeshen group decreased ($P < 0.05$), the mRNA and protein expression of Cyt c and caspase-3 decreased significantly ($P < 0.05$), but there were no significant changes in the mRNA and protein expression of Cyt c and caspase-3 between Siyeshen group and diabetic control group ($P > 0.05$).

Conclusions Exercise and exercise combined with Siyeshen can inhibit cytochrome c release and reduce caspase-3 protein expression, which may be related to the improvement of blood glucose levels in diabetic rats.