Effects of ganoderma lucidum spores on mitochondrial calcium ion and cytochrome C in epididymal cells of type 2 diabetes rats.


OBJECTIVE: To observe the effects of ganoderma lucidum spores (GLS) on mitochondrial calcium ion and cytochrome C in the epididymal cells of type 2 diabetes rats.

METHODS: Fifty adolescent rats were randomly divided into a model group (n=20), a GLS group (n=20) and a control group (n=10). The animals of the former two groups were injected with 2% STZ via vena caudalis for one time to induce type 2 diabetes. Then the model group was given high-fat-sugar diet, the GLS group high-fat-sugar diet + GLS (250 mg/kg x d), and the control group normal diet + CA-citrate sodium buffer. The bilateral epididymides were obtained 10 weeks later and the contents of mitochondrial calcium and cytochrome C detected.

RESULTS: Type 2 diabetes models were successfully constructed. The content of mitochondrial calcium in the epididymal cells was significantly higher in the model group ([3.279 +/- 0.502] mg/L) than in the control group ([2.606 +/- 0.048] mg/L, P < 0.01), with no significant difference between the GLS group ([2.693 +/- 0.196] mg/L) and the control (P > 0.05). In the model group, the content of mitochondrial cytochrome C ([3.213 +/- 1.511] micromol/L) was significantly lower (P < 0.05) while that of cytoplasm cytochrome C ([2.484 +/- 0.661] micromol/L) significantly higher (P < 0.05) than in the control ([5.688 +/- 1.679] micromol/L and [1.574 +/- 0.329] micromol/L, respectively). In the GLS group, the content of mitochondrial cytochrome C ([5.258 +/- 1.550] micromol/L) was higher, with no significant difference (P > 0.05), and that of cytoplasm cytochrome C ([1.727 +/- 0.396] micromol/L) significantly lower than in the model group (P < 0.05), but the difference between the GLS and the control group was not significant (P > 0.05).

CONCLUSION: With disequilibrium of calcium homeostasis and damage to mitochondria, there might be excessive apoptosis in the epididymal cells of type 2 diabetes rats. Ganoderma lucidum spores could protect epididymal cells and counteract their apoptosis in diabetic condition.