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Cordyceps Sinensis protects against Tacrolimus-induced renal and pancreatic injury in rats

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Objectives : Cordyceps Sinensis (CS), a traditional Chinese herbal medicine known as caterpillar fungus, has protective effect against various type of injury. This study was designed to evaluate the beneficial effects of CS on pancreatic and renal injuries caused by tacrolimus.

Methods : Rats were treated daily with tacrolimus (1.5 mg/kg, subcutaneously) and the CS (5 g/kg, oral gavage) for 4 weeks. The impact of CS on pancreatic injury was assessed by blood glucose level, plasma insulin concentration, and HbA1c. In addition, the protective effect of CS on tacrolimus-induced renal injury was evaluated in terms of renal function, histopathology (inflammatory cell influx and tubulointerstitial fibrosis), oxidative stress (8-hydroxy-2'-deoxyguanosine, 8-OHdG), transforming growth factor-beta1 (TGF-β1), apoptosis (Bcl-2, Bax, and caspase-3), and autophagy formation (LC3-II).

Results : Tacrolimus treatment caused diabetes, renal dysfunction, tubulointerstitial inflammation (ED-1-positive cells) and fibrosis, and this was accompanied by increase in 8-OHdG production, upregulation of TGF-β1, caspase-3, and LC3-II expression. Concomitant administration of CS increased plasma insulin concentration and decreased levels of plasma glucose and HbA1c. In the kidney, CS induced improvement of renal function, inflammation, and fibrosis in parallel with suppression of TGF-β1 and 8-OHdG expression. Furthermore, CS treatment inhibited apoptosis and autophagy.

Conclusions : These findings suggest that CS has a protective effect against tacrolimus-induced pancreatic and renal injuries.

Keywords : Cordyceps Sinensis, TAC