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The protective effects of curcumin on exercise-induced renal ischemia reperfusion injury in rats

Fang Li¹, Jianmin Cao¹, Haitao Zhou², Yanlong Niu¹
1. Beijing Sport University
2. Beijing Union University

Objective This study was designed to investigate the effects of curcumin on inflammatory factors and ECM expression in exercise-induced renal ischemia reperfusion injury in rats.

Methods Sixty 7-week-old male SD rats were divided randomly into three groups: group A (normal control group, n=12), group B (overtraining group, n=24) and group C (curcumin + overtraining group, n=24). Group B and C performed 6 weeks of incremental load training on the treadmill. 24 hours after the last training, the rats were anesthetized intraperitoneally, the morphology of renal tissue and the deposition of glomerular ECM were observed using light microscope, the related biochemical indexes were tested.

Results (1) the renal structure of rats in group A were normal, histopathological changes were observed in group B and C, Paller score of group B were significantly higher than group A ($P < 0.01$), and that of group C were significantly lower than group B ($P < 0.05$).

(2) Blood urea nitrogen (BUN) and serum creatinine (Scr), serum and renal inflammatory factors, TGF- β protein expression level and glomerular ECM deposition of group B were significantly higher than group A ($P < 0.01$) and those of group C were lower than group B ($P < 0.05$).

Conclusions Supplementation of curcumin can effectively protect rats from exercise-induced renal ischemia reperfusion injury, by inhibiting the up-regulation of inflammatory cytokines and TGF- β expression and maintaining the dynamic balance of ECM.