Protective effect of penehyclidine hydrochloride on lipopolysaccharide-induced acute kidney injury in rat

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ABSTRACT. We aimed to observe the effect of penehyclidine hydrochloride (PHC) on lipopolysaccharide (LPS)-induced acute kidney injury in rats and expression of tight junction proteins ZO-1 and occludin. Adult male Sprague-Dawley (SD) rats were divided randomly (N = 10) into control group (C), LPS group (LPS), low-dose PHC group (L-PHC), and high-dose PHC group (H-PHC). All rats, except C group, received a vena caudalis injection of 5.0 mg/kg LPS; after 30 min, rats in L-PHC and H-PHC groups received a vena caudalis injection of 0.3 and 0.9 mg/kg PHC. After 24 h, tumor necrosis factor (TNF)-α, interleukin (IL)-1β, serum creatinine (Scr), and blood urea nitrogen (BUN) were...
detected. Histopathological changes and expression of ZO-1 and occludin were observed in renal tissues. Versus levels of TNF-α (38.5 ± 9.0), IL-1β (46.3 ± 12.7), Scr (37.2 ± 9.3), and BUN (6.5 ± 1.1) in control group, those in LPS group, TNF-α (159.0 ± 21.3), IL-1β (130.8 ± 18.7), Scr (98.5 ± 18.2), and BUN (12.8 ± 1.8), increased obviously (P < 0.05), with significantly structural changes and decreases of ZO-1 and occludin. However, TNF-α (111.3 ± 11.6), IL-1β (78.4 ± 14.3), Scr (51.3 ± 12.5), BUN (8.1 ± 1.2) in H-PHC group, and TNF-α (120.8 ± 14.3), IL-1β (92.5 ± 19.0), Scr (56.7 ± 14.7), BUN (9.7 ± 1.6) in L-PHC group were obviously decreased (P < 0.05). PHC has protective effects on acute kidney injury in sepsis, including abatement of renal tissue inflammation and functional improvement, potentially by upregulating ZO-1 and occludin.

**Key words:** Penehyclidine hydrochloride; Acute kidney injury; Lipopolysaccharide