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MEETING ABSTRACT

A1.20

Chloroquine protects injured rat kidney in an experimental model of ischemia–reperfusion (I/R) injury

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Background: Acute kidney injury (AKI) still remains an unresolved problem in pharmacotherapy and renal inflammation is a major factor in its development. Chloroquine, a well-known antimalarial drug, possesses pleitropic effects as well as antiinflammatory, anticoagulant and antioxidative actions. The effects of chloroquine on renal function may involve significant increases in urine flow rate, glomerular filtration rate and sodium excretion, as well as stimulation of nitric oxide synthase. However, its role in experimental models of renal ischemia–reperfusion (I/R) injury is unknown. We aimed to analyze the acute effects of a single dose of chloroquine administered intravenously at three different times in the experimental model of I/R injury in rat.

Methods: Male adult Wistar rats ($n = 57$, body weight 250–300 g) were subjected to bilateral renal ischemia (45 min) followed by reperfusion with saline lasting for 4 hours. Chloroquine was administered i.v. at doses of 0.3 mg/kg and 3 mg/kg 30 min before ischemia, 30 min before reperfusion and 5 min before reperfusion. Selected parameters of glomerular and tubular function, histological score and kidney injury molecule-1 (KIM-1) staining score were followed in sham-operated animals and in rats subjected to I/R injury, pretreated with either saline or chloroquine. These markers were obtained from the appropriate serum, urine or tissue samples at the end of the reperfusion period.

Results: Chloroquine (0.3 and 3 mg/kg, i.v.) protected the I/R injured kidney in a U-shaped manner. Both doses were protective regarding biochemical and histological markers of I/R injury (serum urea, creatinine and fractional excretion of sodium, as well as total histological score, tubular necrosis score and KIM-1 staining score) ($p < 0.05$ *vs.* corresponding controls, *i.e.* rats subjected to I/R injury and treated with saline only). The protective effects of the lower dose of chloroquine were more profound. Time-related differences between pretreatments were not observed ($p < 0.05$, all).

Discussion: Our study shows for the first time that a single dose of chloroquine (0.3 mg/kg i.v.) could attenuate the injured rat kidney in a non-time-dependant manner. It is also important to point out that beneficial effects of acute pretreatment with chloroquine in this experimental model could be confirmed by KIM-1 staining scores.

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