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Pyrazole prevents sepsis-induced acute kidney injury via inhibition of NF-κB pathway in a rat sepsis model

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Objectives: Sepsis is the main cause for acute kidney injury which resulting in high mortality and morbidity. The present study was aimed to define the protective effect of novel pyrazole on the renal inflammation during sepsis in rats.

Methods: A septic rat model was established by cecal ligation and puncture (CLP) and diverse dose of pyrazole was administered to rats. The rats were evaluated for survival, tissue pathology, IL-1β, IL-6, TNF-α, lipoxygenase-5 in plasma. The expression of TLR4, IκB, IKK, NF-κB p65 in kidney tissue was determined using western blot technique. The mRNA expression of renal α_{2A}-AR, α_{2B}-AR and α_{2C}-AR were determined using qPCR analysis.

Results: After CLP, the kidney inflammation was enhanced as shown by elevated plasma level of IL-1β, IL-6 and TNF-α. Moreover, the NF-κB activity and TLR4 expression in rat kidney tissues were increased after CLP. In pyrazole treated group, the tissue histopathology was improved and mortality was reduced. The expression of IL-1β, IL-6 and TNF-α, NF-κB activity and TLR4 expression in rat kidney tissues were found to be reduced significantly as compared to CLP.

Conclusions: The current study demonstrated the protective effect of pyrazole on CLP-induced kidney injury via attenuating NF-κB pathway.