The ameliorative effect of kaempferol against $CdCl_2$-mediated renal damage entails activation of Nrf_2 and inhibition of NF-kB

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This study evaluated the nephroprotective effect of kaempferol against cadmium chloride ($CdCl_2$) -induced nephropathy in rats. It also investigated if activation of Nrf2 is a common mechanism of action. Adult male rats ((150 ± 15 g) were divided into 4 groups (n = 8/each) as a control (1% DMSO, orally), control + kaempferol (200 mg/kg, orally), CdCl2 (50 mg/l in drinking water), and $CdCl_2$+ kaempferol (200 mg/kg)-treated rats. All treatments were conducted for 8 weeks. Kaempferol significantly attenuated CdCl2-induced weight loss, reduction in kidney weights, and the injury in the glomeruli, proximal tubules, and distal tubules in the treated rats. It also significantly

lowered serum levels of urea and creatinine, increased urine output and urinary creatinine levels and clearance but reduced urinary levels of albumin urinary albumin exertion (UAER), and urinary albumin/creatinine ratio (UACR) in these rats. In parallel, kaempferol downregulated renal levels of cleaved caspase-3 and Bax and unregulated those of Bcl2. In the kidney tissues of the control animals and CdCl2 rats, kaempferol significantly attenuated oxidative stress, inflammation and significantly boosted levels of manganese superoxide dismutase and glutathione. Also, and in both groups, kaempferol suppressed the nuclear levels of NF-κB p65, downregulated Keap1, and stimulated the nuclear activation and protein levels of Nrf2. In conclusion, kaempferol is a potential therapeutic drug to prevent CdCl2-induced nephropathy due to its anti-inflammatory and anti-oxidant effects mediated by suppressing NFNF-κB p65 and transactivating Nrf2.