Nephroprotective Effects of Equisetum ramosissimum L. Ethanolic Extract Against Cisplatin-Induced Nephrotoxicity in Albino Rats: A Quasi-Experimental Study

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Introduction

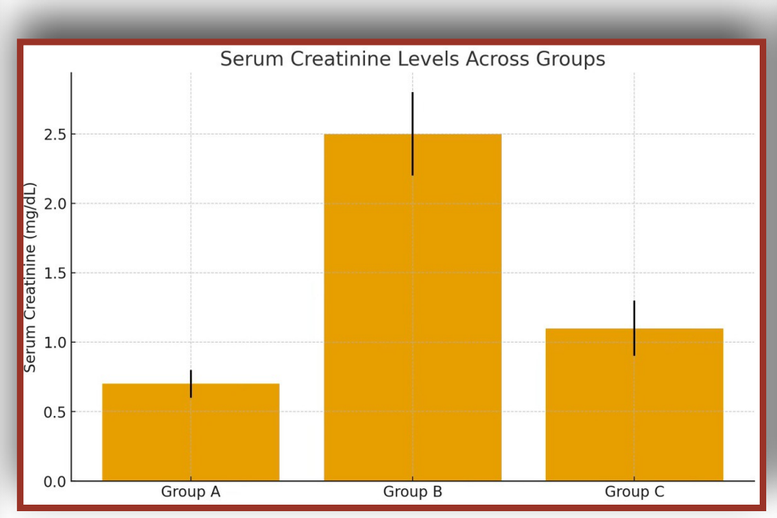
Cisplatin, a widely used chemotherapeutic agent, is associated with significant nephrotoxicity, limiting its clinical utility. Medicinal plants like Equisetum ramosissimum L. have been explored for their antioxidant and nephroprotective properties. This study aimed to evaluate the protective effects of E. ramosissimum ethanolic extract on cisplatin-induced renal damage in albino rats.

Methods

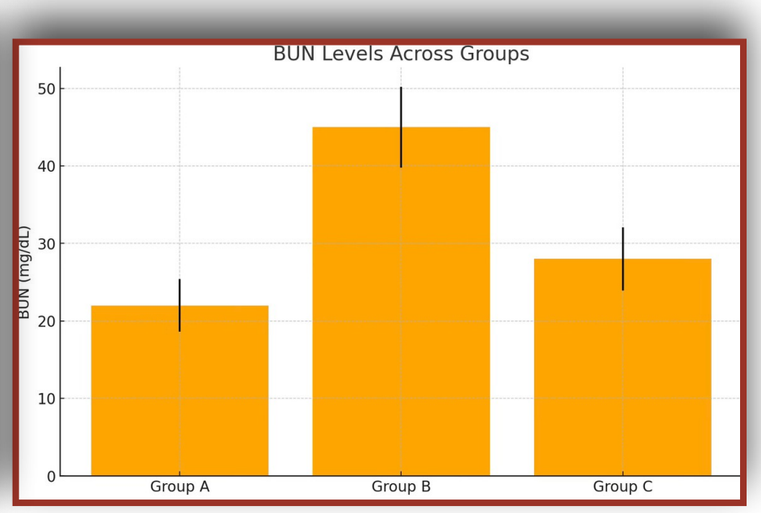
A quasi-experimental study was conducted at Isra University, Hyderabad, from February to July 2025, using 30 adult albino Wistar rats randomly divided into three equal groups. Group A served as the control. Group B received a single intra peritoneal dose of cisplatin (20 mg/kg).Group C received cisplatin followed by E.ramosissimum ethanolic extract (300 mg/kg/day orally) for seven days. Renal function was assessed via serum creatinine, blood urea nitrogen (BUN), and histopathological examination of renal tissue.

Results

Group B exhibited significantly elevated serum creatinine (2.5 ± 0.3 mg/dL) and BUN (45 ± 5.2 mg/dL) compared to Group A (0.7 ± 0.1 mg/dL and 22 ± 3.4 mg/dL, respectively; $p < 0.001$). In contrast, Group C showed substantial improvement in renal markers (creatinine: 1.1 ± 0.2 mg/dL; BUN: 28 ± 4.1 mg/dL; $p < 0.01$ vs. Group B). Histological analysis confirmed reduced tubular necrosis and glomerular damage in Group C compared to Group B.



Graph a



Graph b

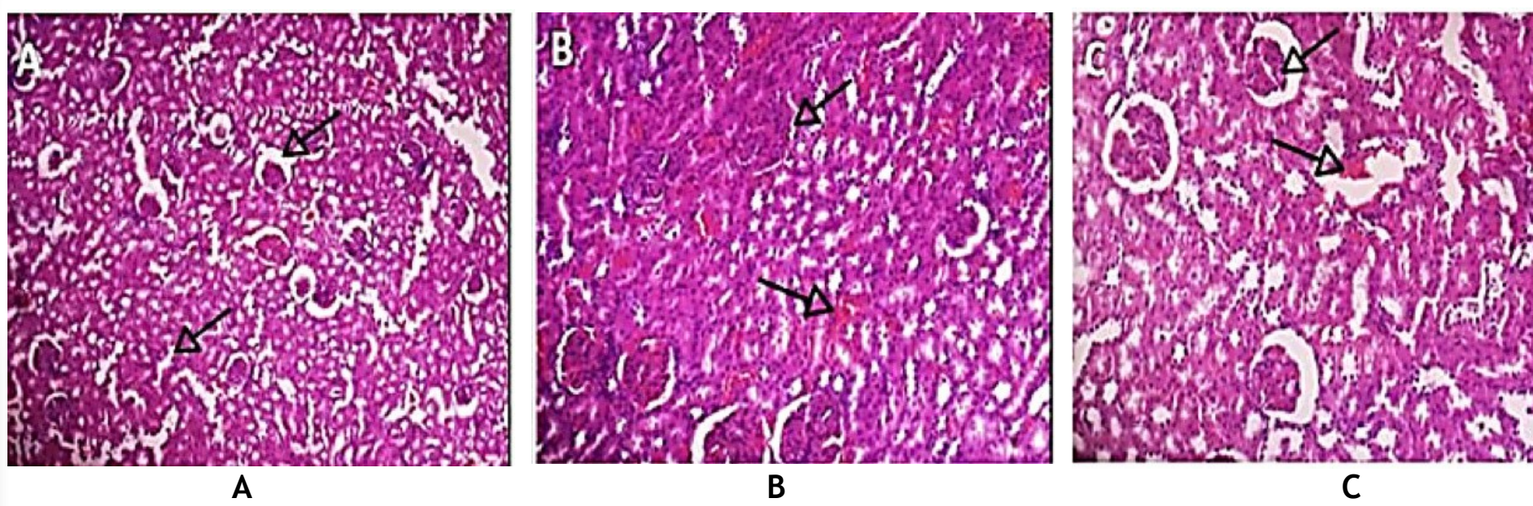


Figure 1. A: Control group shows normal glomerular and tubular architecture (H&E, 100x), B: Nephrotoxic group shows shrinkage of glomeruli, dilatation of Bowman's slit, and congestion (H&E, 400x), C: Near normal glomerular structure and comparatively less apparent renal congestion.

Conclusion

Equisetum ramosissimum ethanolic extract demonstrated significant nephroprotective effects against cisplatin-induced nephrotoxicity in albino rats. These findings support its potential as an adjunctive therapy to mitigate cisplatin- associated renal injury.

Keywords

Equisetum ramosissimum, nephrotoxicity, cisplatin, nephroprotection, herbal extract, albino rats