

Nephroprotective Effect of Aqueous Extract of *Plectranthus amboinicus* (Roxb.) Leaves in Adriamycin Induced Acute Renal Failure in Wistar Rats: A Biochemical and Histopathological Assessment

Authors : Ampe Mohottige Sachinthe Sandaruwani Amarasiri, Anoja Priyadarshani Attanayake, Kamani Ayoma Perera Wijewardana Jayatilaka, Lakmini Kumari Boralugoda Mudduwa

Abstract : The search for alternative pharmacological therapies based on natural extracts for renal failure has become an urgent need, due to paucity of effective pharmacotherapy. The current study was undertaken to evaluate the acute nephroprotective effect of aqueous leaf extract of *Plectranthus amboinicus* (Roxb.) (Family: Lamiaceae), a medicinal plant used in traditional Ayurvedic medicine for the management of renal diseases in Sri Lanka. The study was performed in adriamycin (ADR) induced nephrotoxic in Wistar rats. Wistar rats were randomly divided into four groups each with six rats. A single dose of ADR (20 mg/kg body wt., ip) was used for the induction of nephrotoxicity in all groups of rats except group one. The treatments were started 24 hours after induction of nephrotoxicity and continued for three days. Group one and two served as healthy and nephrotoxic control rats and were administered equivalent volumes of normal saline (0.9% NaCl) orally. Group three and four nephrotoxic rats were administered the lyophilized powder of the aqueous extract of *P. amboinicus* (400 mg/ kg body wt.; equivalent human therapeutic dose) and the standard drug, foscipril sodium (0.09 mg/ kg body wt.) respectively. Urine and blood samples were collected from rats in each group at the end of the period of intervention for the estimation of selected renal parameters. H and E stained sections of the kidney tissues were examined for histopathological changes. Rats treated with the plant extract showed significant improvement in biochemical parameters and histopathological changes compared to ADR induced nephrotoxic group. The elevation of serum concentrations of creatinine and β 2-microglobulin were decreased by 38%, and 66% in plant extract treated nephrotoxic rats respectively ($p < 0.05$). In addition, serum concentrations of total protein and albumin were significantly increased by 25% and 14% in rats treated with *P. amboinicus* respectively ($p < 0.05$). The results of β 2 -microglobulin and serum total protein demonstrated a significant reduction in the elevated values in rats administered with the plant extract (400 mg/kg) compared to that of foscipril (0.09 mg/kg). Urinary protein loss in 24hr urine samples was significantly decreased in rats treated with both foscipril (86%) and *P. amboinicus* (56%) at the end of the intervention ($p < 0.01$). Accordingly, an attenuation of morphological destruction was observed in the H and E stained sections of the kidney with the treatments of plant extract and foscipril. The results of the present study revealed that the aqueous leaf extract of *P. amboinicus* possesses significant nephroprotective activity at the equivalent therapeutic dose of 400 mg/ kg against adriamycin induced acute nephrotoxicity.

Keywords : biochemical assessment, histopathological assessment, nephroprotective activity, *Plectranthus amboinicus*

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