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Nephroprotective effects of a novel polyherbal combination against the animal model of adriamycin-induced nephrotoxicity

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Background: Polyherbal combinations with significant therapeutic efficacy play an important role in the regaining of kidney functions, particularly in drug-induced nephrotoxicity.

Objective: The present study was to evaluate the nephroprotective activity of a novel polyherbal combination against the animal model of adriamycin-induced nephrotoxicity.

Methods & Materials: The polyherbal combination was derived from the standardized refluxed (4 hour) aqueous extract of *Abelmoschus moschatus* Medikus. (leaves), *Asparagus falcatus* L. (leaves) and *Barleria prionitis* L. (whole plant) mixed in equal quantities (1:1:1 w/w). Potential nephroprotective effects were evaluated after treatment with the aqueous extract at 200, 400 (equivalent human therapeutic dose) and 600 mg/kg doses for 28 consecutive days in adriamycin (5 mg/kg, ip) induced nephrotoxicity model in Wistar rats (n=6/group). Fosinopril sodium (0.09 mg/kg) was used as a reference drug. At the end, the biochemical parameters were assessed in serum and urine and a semi-quantitative analysis of histopathology on Haematoxylin & Eosin stained kidney sections were performed. Data were statistically analyzed by one-way analysis of variance followed by Fisher's least significant difference and Kruskal-Wallis tests.

Results: Treatment with the polyherbal combination in nephrotoxic rats significantly decreased the concentrations of serum creatinine (-24%, -30%, -30%), urea nitrogen (-41%, -60%, -61%), β_2 -microglobulin (-6%, -7%, -12%), and urine total protein (-31%, -48%, -44%) compared to the nephrotoxic control group. Serum concentrations of total protein (+13%, +14%, +15%) and albumin (+5%, +20%, +15%) increased significantly ($p < 0.05$) compared to the nephrotoxic rats. Histopathological sections showed a decrease in the extent of acute kidney injury in rats treated with the polyherbal combination, as indicated by the results of the semi-quantitative analysis. The 400 and 600 mg/kg doses of the polyherbal combination showed significant nephroprotection compared to the 200 mg/kg dose and the reference drug, fosinopril.

Conclusion: The results revealed that the aqueous polyherbal combination has significant nephroprotective activity against adriamycin-induced acute nephrotoxicity.

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