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Evaluation of Antiurolithiatic Activity of Combination of *Phyllanthus niruri* and *Aerva lanata* in Ethylene Glycol induced Urolithiasis in Rats

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Abstract:

Phyllanthus niruri and *Aerva lanata* are widely used for the treatment of urolithiasis in folklore system of medicines. The present study was aimed to investigate the protective effect of combination of methanolic extracts of both of the plants in renal cell injury. Urolithiasis was induced by administration of 0.75% v/v ethylene glycol in drinking water and simultaneously the plant extracts were given to the urolithiatic rats both alone and combination for 30 days. Urinary volume and the level of calcium, phosphate, oxalate in urine was determined. Serum parameters (creatinine, uric acid, urea, blood urea nitrogen, malondialdehyde and antioxidant enzyme (reduced glutathione, superoxide dismutase, catalase) level was also evaluated in urolithiatic rats. Oxalate excretion significantly increased in hyperoxaluric animals as compared to control urolitiatic animals. Combination of methanolic extracts of both of the plants significantly decreased the oxalate and calcium excretion and increased the excretion of magnesium. The treatment also significantly reduced level of malondialdehyde and improved the activity of antioxidant enzymes followed by reduction in blood urea nitrogen, urea and serum creatinine. Histological analysis indicates that the treatment also inhibited deposition of CaOx crystal and renal cell damage. The present study reveals that the combination of methanolic extract of *Phyllanthus niruri* and *Aerva lanata* protects against hyperoxaluric oxidative stress and renal cell injury in urolithiasis due to their antioxidant activity.

Key words: *Aerva lanata*, antioxidants, malondialdehyde, *Phyllanthus niruri*, urolithiasis.

Introduction

Urolithiasis is a condition which denotes stones originating anywhere in the urinary tract, including the kidneys and bladder.Urinary stone disease is estimated to occur in approximately 12% of the population, with a recurrence rate of 70–81% in males, and 47–60% in females [1]. The disease affects 1–5% of the population in developed nations with a peak incidence between 20 and 50 years of age [2]. Studies have also shown that tubular cell injury facilitates CaC_2O_4 crystal formation and deposition in the renal tubules [3]. Animal and tissue culture studies have demonstrated that both oxalate and CaC_2O_4 crystals directly induce renal epithelial cell injury mediated through lipid peroxidation and involve oxygen free radical generation [4].

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