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COMPOSITION OF HUMAN RENAL CALCULI OBTAINED FROM PATIENTS IN SOME DISTRICTS OF SRI LANKA

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Formation of renal calculi is influenced by various factors such as gender, age, environment, food habits and lifestyle. The composition of calculi may reveal the underlying pathology that may be useful in treatment of patients and preventing recurrence. The present study was carried out to establish the composition of calculi and relate it among different category of patients.

Seventy-nine renal calculi samples from patients between 21 - 80 years of age were collected from 20 districts in Sri Lanka and standard chemical methods were used to measure oxalic acid (OA), calcium (Ca), phosphorus (P), uric acid (UA), magnesium (Mg) quantitatively and Ammonium ion (NH_4^+), carbonate ion (CO_3^{2-}), cystine qualitatively. Ethical clearance was obtained from the Postgraduate Institute of Science. The results were categorized by gender, age groups, districts, climate zones, and analysed using 'Minitab 16'.

The occurrence of calculi was higher in males (Male: Female = 3.1:1) and in the age group between 41 - 60 years. The recurrence rate was 40%. The contents of calculi were OA (Mean ± SD, Median; 48.24 ± 11.23, 51.64 mg% [mg/100 mg]), Ca (15.84 ± 4.23, 16.97 mg %), P (1.17 ± 2.58, 0.27 mg %), UA (0.26 ± 0.41, 0.07 mg %) and Mg (0.27 ± 0.52, 0.15 mg %). 100 % of the calculi contained OA. Ca was detected in 96%, P in 29%, UA in 15%, Mg in 8%, NH_4^+ in 59.5%, while CO_3^{2-} and cystine were not detected. The types of the calculi were oxalate stone (84.8%), mixed (11.4%), phosphate (2.5%) and infection stone (1.3%). 70% of patients with renal calculi had consumed ≤ 1.5 L water/day and 30% had consumed > 1.5 L/day. 60% had consumed water from wells including tube wells while the remaining had consumed pipe borne water.

Our study reveals that occurrence and recurrence of calculi is higher in males. Peak occurrence is noted between 41 - 60 years revealing the risk at middle age. Oxalate was the commonest type of stone identified while OA and Ca were the major components of calculi. The composition of calculi did not significantly ($p > 0.05$) vary among gender, age groups, districts and climate zones, except oxalic acid which was significantly higher ($p < 0.05$) in men than women. This study established the composition of calculi, and found no significant variation among age groups, districts and climate zones.