Urolithiasis Associated with Hypercalciuria


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Fifty male patients with urolithiasis (UL), associated with idiopathic hypercalciuria (IH), were studied in comparison to a group of 18 male normocalcemic patients with inactive calcium stone disease of unknown etiology. In the group of IH-UL, in addition to hypercalciuria, statistically significant hyperphosphaturia with decreased tubular reabsorption of phosphate and hyperuricemia were observed; there was a tendency to hypophosphatemia although non-significant. In 36% of the IH-UL patients the first episode of renal colic appeared at age 40 to 50. Thirty-eight per cent of the IH-UL patients had recurrent stone formation. Twenty per cent of the IH-UL patients had a family history of urolithiasis. Forty-six per cent of all stones contained oxalate in addition to calcium, and 25% of the stones contained oxalate and phosphate.

The term idiopathic hypercalciuria has been assigned to normocalcemic hypercalciuria of unknown etiology. The syndrome is characterized by an abnormally high renal excretion of calcium, normocalcemia, normo- or hypophosphatemia and high frequency of renal calcium stones [1]. The mechanism underlying the hypercalciuria in IH is not known with certainty and three different abnormalities have been proposed as the primary cause: intestinal hyperabsorption, decreased tubular reabsorption of calcium, and increased catabolism of bone [2, 3]. Elevated serum levels of parathyroid hormone have been observed in IH by several investigators and considered by some to reflect secondary hyperparathyroidism as a response to renal calcium loss [4], and by others “normocalcemic” primary hyperparathyroidism [5, 6].

The genetic aspect of IH has as yet not been sufficiently evaluated. There is no information on familial occurrence of the disease. In this communication we present clinical and biochemical observations on a large series of patients with IH and urolithiasis (IH-UL).

Material and methods

Fifty adult patients aged 24 to 65 years with IH-UL were studied. Their age distribution is shown in Table 1.

All patients were admitted for a period of 14 days to the metabolic ward and placed on a diet containing 900 mg calcium/day. Having been on this diet for
at least 3 days, all patients had subsequently a urinary calcium excretion of above 300 mg/day (a value higher than the upper limit of normal [7]) on at least 8 days out of 10 daily examinations. Hypercalciuric conditions such as sarcoidosis, renal tubular acidosis, multiple myeloma, Cushing’s syndrome and various malignancies were excluded during hospitalization. According to accepted clinical and biochemical criteria [8, 9] none of the patients had primary hyperparathyroidism: neither bone pain, peptic ulcer, chronic pancreatitis, mental disturbances nor subperiostal resorption, hypercalcemia or decreased tubular reabsorption of phosphate (under 85%) were found in any of them. Biochemical investigations included measurement of serum and urinary calcium, inorganic phosphorus, uric acid and creatinine, all determined by the Technicon AutoAnalyzer. In 6 patients serum parathyroid hormone level was determined by radioimmunoassay and found to be elevated in 5 [10]. Plain abdominal film, intravenous pyelogram and skeletal X-ray survey were performed on each patient. Renal calculi, when available, were analyzed chemically using the method of Winer and Mattice [11]. Statistical analysis was performed with the Student t-test [12].

**Results**

The diagnosis of IH was made in 50 patients at an average age of 45.5 years. Renal colic or stone expulsion appeared for the first time at an average age of 31.5 years, i.e. 14 years before the diagnosis was made. Twenty per cent of the patients with IH-UL had a family history of urolithiasis. In 91% of these patients renal colic or stone expulsion was the presenting symptom that led to the diagnosis of IH. Nine per cent of the IH-UL patients were investigated because of hypercalciuria and/or hyperuricosuria detected before urolithiasis was known. Nineteen of the patients (38%) had recurrent stone formation and 17 patients (34%) underwent surgical intervention for urolithiasis.

The initial biochemical data on the 50 patients with IH-UL and on 18 subjects of the control group (UL) are shown in Table 2. In the group of IH-UL, in addition to hypercalciuria, statistically significant hyperphosphaturia with decreased tubular reabsorption of phosphate (TRP) and hyperuricemia were observed; there was a tendency to hypophosphatemia, although non-significant.