Renal Histology for the Diagnosis of Primary Hyperoxaluria in Patients with End-Stage Renal Disease

M.L.N. Murty
Isha Garg
A. Anand Date
C.K. Jacob
M.G. Kirubakaran
J.C.M. Shastry

Departments of Nephrology and Pathology, Christian Medical College, Vellore, India

Prof. J.C.M. Shastry, Department of Nephrology, C.M.C. Hospital, Vellore 632004 (India)

Sir,

Renal transplantation is no longer contraindicated in patients with end-stage renal disease (ESRD) due to primary hyperoxaluria. Recurrence of the disease in the graft can be prevented by special pre- and posttransplantation measures [1]. Hence, it is important to establish the diagnosis of primary hyperoxaluria before transplantation. The diagnosis of primary hyperoxaluria in ESRD is difficult by current methods as it depends on the demonstration of increased urinary oxalate excretion [2]. In advanced renal failure urinary oxalate excretion decreases and may fall within normal range. The plasma oxalate levels vary widely [2]. Furthermore, oxalate deposits can occur in kidneys of patients with ESRD due to diseases other than primary hyperoxaluria [3, 4]. The present study was undertaken to determine whether the magnitude of oxalate deposition in kidneys of patients with ESRD would be useful in the diagnosis of primary hyperoxaluria.

Pretransplant nephrectomy specimens in 41 patients with ESRD were studied. Of these 2 patients had primary hyperoxaluria. The etiology of ESRD in the remaining 39 patients was uncertain: end stage histology in 19, chronic interstitial nephritis in 8, adult polycystic kidney disease in 6, chronic glomerulonephritis in 4 and end-stage of crescentic glomerulonephritis in 2. The histological sections of these nephrectomy specimens were reviewed. Clinical information was obtained from the hospital records. The average duration of dialysis was 4.2 months (range 1–7 months).

Calcium oxalate crystals were identified as light brown crystals in hematoxylin-eosin sections. Using polarized light, oxalate deposit was quantified. Ten non-overlapping cortical fields were examined and the number of tubule cross-sections containing oxalate crystals were counted and scored according to the method of Scheinman et al. [1]. Microscopically oxalate crystals were deposited most commonly in tubules (fig. 1, 2). Interstitial oxalate crystals were less frequently seen.

Fig. 1. Renal oxalate deposits in ESRD not due to hyperoxaluria.
Fig. 2. Renal oxalate deposits in ESRD due to primary hyperoxaluria.
A score of 3 was assigned for crystals that filled the entire tubule, a score of 1 for crystals occupying 5–10% of tubules and a score of 2 for intermediate amounts. Total number of oxalate-containing tubule cross-sections multiplied by crystal scores and divided by the number of cortical fields studied was expressed as a histology score. The average histology score of the 2 patients with ESRD due to primary hyperoxaluria was 83.5 (61.1 and 106). In the remaining 39 patients, the average histology score was 1.11 (range 0–4.1).

In the present study the histology scores for oxalate crystals were significantly higher in patients with ESRD due to primary hyperoxaluria than those with ESRD due to other causes. Renal histology may be a useful procedure when this disease is suspected in patients with end-stage renal failure.

References