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Evaluation of the state of health of living related kidney transplantation donors

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Abstract Renal transplantation is the optimal mode of therapy for patients with end-stage renal disease; the results are even better with living related donors. This procedure, therefore, favours the recipients, but what are the consequences for the donor? At our Department, between 1973 and 1996, 1325 kidney transplantations were performed, 78 from living, related donors (5.89 %). We decided to follow up these patients and investigate the function of the remaining kidney and also their current general health status. Thirty donors (38.4 %) were investigated. Of these, 25 of had normal blood pressure and 5 were hypertensive, needing antihypertensive treatment. The average age was higher in the hypertensive group (60.2/53.25 years). The time interval since transplantation was longer in the hypertensive group than in the normal one. We carried out a scintigraphy of the kidney with Tc-99mMAG-3. The mean value of the glomerular filtration rate calculated from the MAG clearance was 98.1 ml/min and this value is higher than half of the normal isotope clearance value, i.e. higher then the expected value for a single kidney. We conclude that no impairment of renal function is observed in the living, related kidney donors. In 16.66 % a mild hypertension developed. With isotope investigation we found hypertrophy of the remaining kidney. Thus, after a correct preoperative assessment, unilateral nephrectomy has no long-term consequences in healthy donors.

Key words Living related · Kidney transplantation · Donor evaluation

Introduction

Renal transplantation is the optimal mode of therapy for patients with end-stage renal disease (ESRD). It restores the metabolic and endocrine functions of the kidney and the quality of life is much better than that of patients on dialysis. The results of transplantation are even better with living, related donors than with cadaveric ones. Not only the graft, but the patients' survival rates are higher.

Transplantation between close relatives, especially siblings identical for HLA, remains superior to cadaveric transplantation. It also spares the recipient a long waiting period on dialysis; so living related renal transplantation is the ideal option for ESRD. This procedure favours the recipients, but what are the consequences for the donor [6]? Is donor nephrectomy a safe procedure [1] and, apart from the risk of the potential postoperative complications, what are the long-term consequences affecting the donors themselves?

The aim of this study was to evaluate the general health status of donors, in particular their renal function and blood pressure measurements [3].

Materials and methods

At our Department, between 1973 and 1996, 1325 kidney transplantations were performed. Of these, 1247 were from ca-

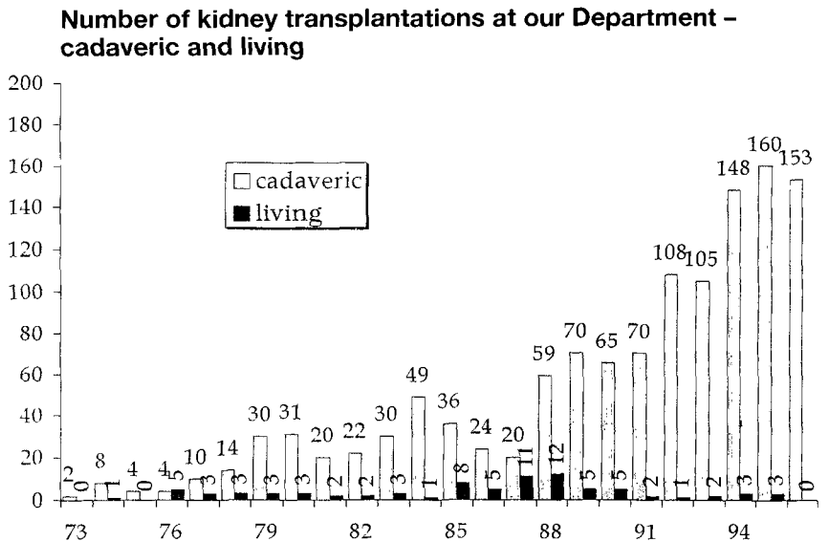

Fig. 1 Number of kidney transplantations at the Transplantation Department in Budapest

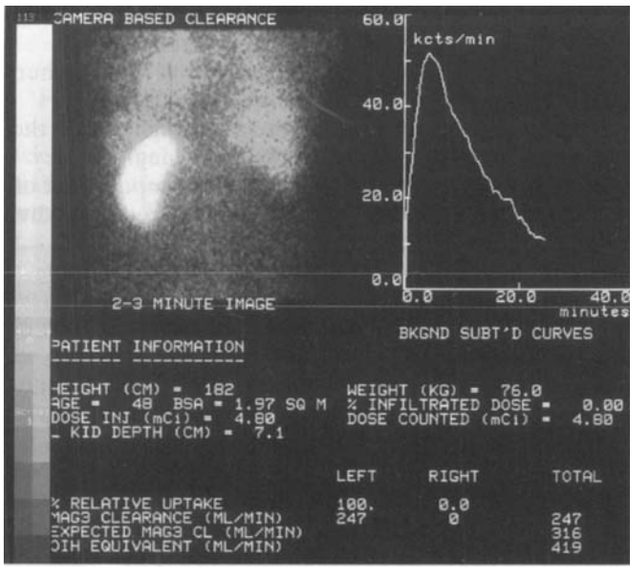

Fig. 2 Scintigraphy of the kidney with Tc-99mMAG-3

Table 1 Distribution of donors according to blood pressure *(BP)*

	BP normal	BP hypertensive	Difference
Number of patients	25	5	
Average age (years)	53.25 SD ± 9.4426	60.2 SD ± 7.328	Higher in the hypertensive group
Serum creatinine (μmol/l)	80.8 SD ± 18.318	88.0 SD ± 22.056	None
Creatinine clearance (ml/min)	97.1 SD ± 33.822	98.9 SD ± 45.010	None

daveric donors while 78 (5.89%) were from living related donors [4] (Fig. 1). We decided to follow up the latter patients and investigate the function of the remaining kidney and also their current general health status. We contacted these donors by post. Thirty patients (38.4%) came to our Department. The average time interval since transplantation was 8.92 years. We measured the blood pressure of each patient. Apart from routine laboratory tests, creatinine values of urine (collected for 12 h) were measured and creatinine clearance calculated. Ultrasound and isotope investigations and an ECG were carried out.

Results

Thirty donors were investigated, 25 female and 5 male. Their average age was 54.64 years. They were all blood relatives of the recipients; 23 mothers, 5 fathers, 1 sister and 1 aunt. Of those, 25 had normal blood pressure and 5 were hypertensive, needing antihypertensive treatment. We compared these two groups and we found that the average age was higher in the hypertensive group (60.2/53.25 years). There was no difference in the serum creatinine levels (88/80.8 μmol/l) or in the creatinine clearance (98.9/97.1 ml/min) (Table 1). The time interval since transplantation was longer in the hypertensive group than in the normal one. We could not observe proteinuria and the urinary sediment was also negative. No abnormality was detected by ultrasound investigation of the kidney. We carried out a scintigraphy of the kidney with Tc-99mMAG-3 [5]. The mean value of glomerular filtration rate calculated from the MAG clearance was 98.1 ml/min and this value is higher than half of the normal isotope clearance value, i.e. higher than the expected value for a single kidney [2] (Fig. 2).

Discussion

No impairment of renal function was observed in the living, related kidney donors. In 16.66%, a mild hypertension developed, but it was of non-renal origin and no more common than in the general population. With isotope investigation we found a higher effective renal plasma flow and MAG3 value, which shows a compensatory hypertrophy of the remaining kidney. In conclusion, after a correct preoperative assessment, unilateral nephrectomy has no long-term consequences for healthy donors.

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