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KIDNEY TRANSPLANTATION IN CHILDREN AND ADOLESCENTS OF SOUTHERN IRAN

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ABSTRACT

In this first report on the experience with renal transplantation in children and adolescents in southern Iran during the past five years, thirty-two patients (aged 5-19 years old; 18 males, 14 females) received renal allografts. Pretransplantation pathologic diagnoses by kidney biopsy were: membranoproliferative glomerulonephritis (MPGN), rapidly progressive glomerulonephritis (RPGN), chronic glomerulonephritis, chronic pyelonephritis, reflux nephropathy, obstructive uropathy and renal tubular acidosis (RTA). The cause of ESRD was unknown in eleven cases. Overall one year graft survival was 89%, 71% at two years, and 50% at four years. The overall patient survival at one year was 93% and at two years, 86%. Well-being and remarkable improvement of physical, emotional, biochemical and endocrinological impairment were noticeable in 74% of the patients. No recurrence of primary disease was detected during the study period.

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INTRODUCTION

Experience with renal transplantation in children, which dates back to over thirty years, was at one time felt to be dramatic and dangerous. Today this modality is accepted as an optional form of therapy for ESRD. Improvement of peri- and postoperative care, immunosuppressive therapy and treatment of rejection have all contributed to improved patient survival and graft outcome in pediatric and adolescent renal transplants. During the last few years, experience with pediatric transplantation is available from two Iranian centers (Tehran and Shiraz); in this report, the experience in Shiraz (southern Iran) is presented.

PATIENTS AND METHODS

From November 1989 to December 1994, thirty-two patients in the pediatric/adolescent age group received renal grafts (5-19 years old; 18 males, 14 females). All had failure to thrive with delayed puberty. A pretransplantation pathological diagnosis by kidney biopsy was available in twelve patients and consisted of membranoproliferative glomerulonephritis (MPGN) in 3, chronic glomerulonephritis in 4, rapidly progressive glomerulonephritis (RPGN) in one, chronic pyelonephritis in 3 and nephronophthisis in one. Reflux nephropathy was the underlying cause in 3, obstructive uropathy in 4 [including one case of posterior urethral valve (PUV)], renal tubular acidosis (RTA) in one, ATN in one, and ESRD with unknown cause in eleven. The patients had been on pretransplantation dialysis for periods ranging from six months to two years. Five received kidneys from cadavers, fifteen from living unrelated and twelve from living related donors. Creatinine clearance, and not iothalamate clearance, was used for glomerular filtration rate (GFR) estimation.

Table I. Graft survival among pediatric and adolescent renal allograft recipients.

Graft Survival				
Type	**Total**	**One-year**	**Two-year**	**Four-year**
Related	12	10 (90%)	7 (87%)	1 (50%)
Non-related	15	11 (91%)	3 (50%)	3 (50%)
Cadaveric	5	4 (80%)	-	-
Total	32	25 (89%)	10 (71%)	4 (50%)

Note: The percentage has taken into consideration the number of patients lost to follow-up in each time period.

Table II. Patient survival among pediatric and adolescent renal allograft recipients.

Patient Survival				
Type	**Total**	**One-year**	**Two-year**	**Four-year**
Related	12	10 (90%)	7 (87%)	1 (50%)
Non-related	15	12 (100%)	5 (83%)	3 (50%)
Cadaveric	5	4 (80%)	-	-
Total	32	26 (93%)	12 (86%)	4 (50%)

Note: The percentage has taken into consideration the number of patients lost to follow-up in each time period.

RESULTS

Post-transplantation complications were as follows: acute tubular necrosis (followed by complete recovery) occurred in six patients, acute reversible rejection in five, obstructive uropathy in two, and urinoma in one. One patient developed sepsis, thrombosis and papillary necrosis one week post-transplant and died; she had received the graft from a cadaver with thalassemia major. Three patients developed chronic rejection within one and a half years; two of these patients had interstitial fibrosis on biopsy, but in the third patient biopsy was not feasible due to intraperitoneal implantation. We have not observed any evidence of primary disease recurrence during the five and a half year follow-up period. Well-being and remarkable improvement of physical, emotional, biochemical and endocrinological impairments were noticeable in 74%; regular menses in females with delayed menarche was one of the significant improvements. A patient with RTA who had been unable to walk for years is now able to have normal physical activity and is an excellent student. Sixty-five percent of the patients had functioning kidneys with normal GFRs in the five-year follow-up period.

The graft survival data are depicted in Table I. The overall graft survival was 89% after one year, 71% after two years and 50% after 4 years. The patient survival data are depicted in Table II. Five patients died during follow-up due to septicemia and three due to unknown cause. The overall patient survival after one year was 93% and after two years, 86%.

DISCUSSION

Recently, more effective immunosuppressive agents such as cyclosporine A (CYA) have improved patient and graft survival rates in children with kidney transplantation.[1,2] Recurrences of primary disease have been reported as the cause of 5-11% of graft failures.[3,4] We have not observed any evidence of recurrence of primary disease during the five and a half years of follow-up, even in the biopsy of the patient with chronic rejection who had originally been a case of MPGN. One cadaver-kidney recipient whose donor had been a case of thalassemia major developed sepsis and renovascular thrombosis. The thrombosis was most probably not related to the surgical technique, or high-dose CYA,[5] but rather we speculate it was due to the hemodynamic nature of the donor's disease; this phenomenon needs further investigation. Our experience indicated good kidney survival and GFR maintenance in the follow-up period. Considering the fact that our patients are young, the actual four-year graft and patient survival rates will, in the long-run, most probably prove to be even higher than that noted in Tables I and II.

With an increasing number of pediatric and adolescent transplantations, the survival data are expected to improve significantly. Compliance has been good among our cases in spite of young age and a relatively lower education: this is most probably due to cultural and religious factors which encourage compliance with physician advice and emphasize the sanctity of human life.[6-8]

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