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Improved outcome of renal transplantation in amyloidosis

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Abstract We report our results in 96 patients with amyloidosis who received 105 cadaveric renal allografts. The graft survival of amyloidosis patients has improved with time and with improved immunosuppression. The graft survival of amyloidosis patients is comparable to the results in another systemic disease, i.e., diabetes, and only slightly inferior to those in primary renal disease, even though amyloidosis patients tolerate complications poorly and the patients are at high risk of dying during the first 3 months.

Key words Amyloidosis
Renal transplantation
Kidney transplantation

Introduction

Renal amyloidosis is a rare cause of end-stage renal failure. Even though the first case was reported 25 years ago by Belzer [1], it is not accepted worldwide as an indication for renal transplantation. Since 1973, selected patients with amyloidosis have been accepted in our renal transplant program. We report our results in over 100 renal transplantations in amyloidosis patients in three consecutive time periods with different immunosuppressive therapies. The results of amyloidosis patients in the last period with triple therapy are compared with the results in patients from the same time period with another systemic disease, i.e., diabetes, and with the results in patients with primary renal disease.

Patients and methods

In our center, between March 1973 and February 1992, 2322 transplantations were performed. Twenty percent of the patients had diabetes and 4.5% amyloidosis. These 96 amyloidosis patients have received 105 renal cadaveric transplants. The amyloidosis patients were grouped according to their initial immunosuppressive therapy in three consecutive periods. The first group, from III-73 to IX-81, received azathioprine and steroids ($n = 46$). The second group, from X-81 to VIII-85, received cyclosporine with or without steroids ($n = 24$). The third group, from IX-85 to II-92 received triple drug therapy, cyclosporine, steroids and azathioprine ($n = 35$). During the last period we also compared amyloidosis patients with 210 patients from the same time period with diabetic nephropathy and 601 patients with primary renal disease patients in our center who all received the same triple therapy.

Five of the amyloidosis patients had primary amyloidosis. Of the 91 patients with secondary amyloidosis, the cause in 67 patients was rheumatoid arthritis, in 11 patients ankylosing spondylitis and in 13 patients chronic inflammatory disease. The mediam age of the patients was 48 years (range 16–67) and the male-to-female ratio was 53:43. All amyloidosis patients received cadaver kidney transplants and all patients were on dialysis before transplantation. During the last period under 10% of the transplantations in diabetics and primary renal disease were from living related donors. HLA matching was used in recipient selection throughout.

Results

For all amyloidosis patients the 3-year patient and graft survival were 61% and 51%, respectively, and the 5-year patient and graft survival 49% and 39%, respectively.

The most common cause of graft loss was patient death ($n = 35$). The mean survival of these patients was 3 years. Other causes of graft loss were: acute rejection (12), chronic renal failure (11), non-functioning graft (11) and surgical causes (2). Altogether, 61 of 96 patients have died. The main causes of death were infection (22), cardiovascular (19) and amyloidosis (13). Three patients died because of hemorrhagic pancreatitis.

Seven of 12 patients who lost their graft due to acute rejection died during the first 3 months. A further 7 of 11 patients with a non-functioning graft died during the first 2 months after transplantation. Only six patients have survived over 1 year on dialysis after losing graft function.

Thirty-four patients have a functioning graft. The median follow-up of patients with a functioning graft is 44 months (range 10–175 months) and the mean follow-up is 62 months. The median last creatinine for these patients is 94 μmol/l (range 60–286 μmol/l). There are 6 patients with a graft that has functioned for over 10 years. Seven of the 9 retransplantations were done before 1982. Graft survival in the three consecutive periods is presented in Fig. 1. The 1- and 3-year patient survival were 60% and 48% in the first group, 67% and 67% in the second group and 83% and 75% in the third group, respectively. The age of the recipient did not significantly affect patient survival in this study. One-year patient survival was 89% in diabetic nephropathy and 96% in primary renal disease. One-year graft survival was 83% in diabetic nephropathy and 89% in primary renal disease. Five-year patient and graft survival in the three patient groups receiving triple therapy is presented in Figs. 2 and 3, respectively.

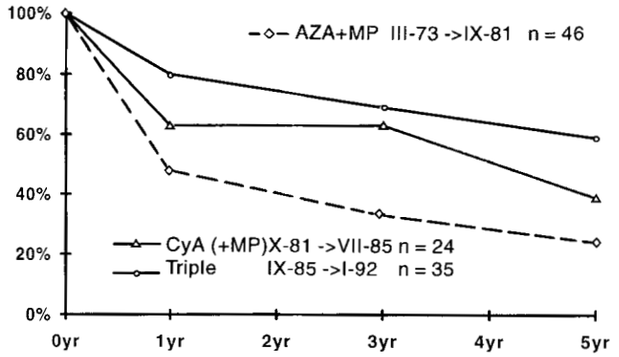

Fig. 1 Graft survival in amyloidosis. Three groups with different immunosuppression therapies in three consecutive periods

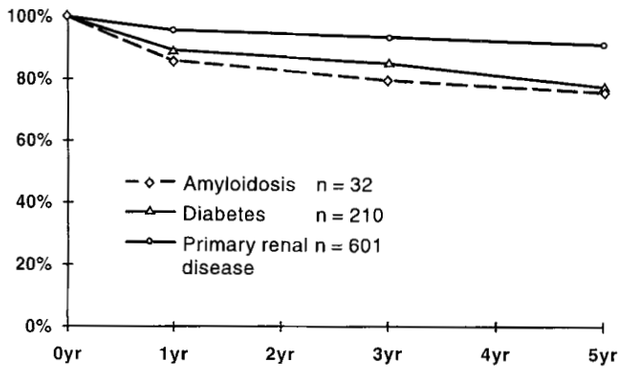

Fig. 2 Patient survival in patients receiving triple drug therapy. Amyloidosis patients compared to diabetic patients and with patients with primary renal disease. Transplantations were performed between 1986 and February 1992 with at least 1-year follow-up

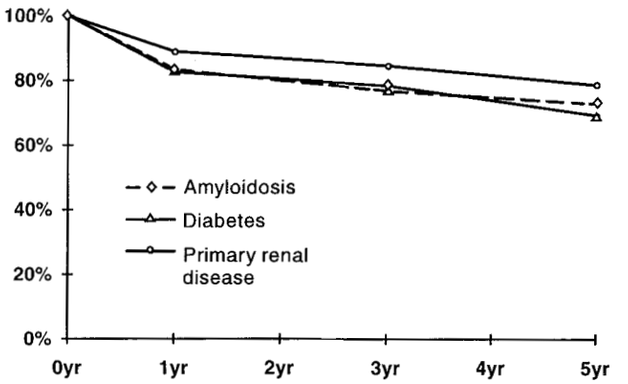

Fig. 3 Graft survival in patients receiving triple drug therapy. Amyloidosis patients compared with diabetic patients and patients with primary renal disease

Discussion and conclusion

During the last 20 years selected patients with amyloidosis have been accepted at our center for renal transplantation [3]. Another report of a 15-year transplantation program accepting systemic disease with amyloidosis has recently been published [2]. This program differs from ours in that half of the patients (31/62) have received a living donor graft. At our center all amyloidosis patients received cadaver kidneys, although the results of amyloidosis patients are comparable to those of diabetic patients. Over 10% of diabetic patients have received transplants from living relatives at our center.

In this study, we did not find that age had the effect on survival it had at the start of our program [4] and in the other study by Hartman et al. [2]. Amyloidosis patients tolerated complications poorly. Mortality was concentrated at the early post-transplant period, and the risk of

death was high if the graft failed. In conclusion, the results of amyloidosis patients have improved similar to other patient groups with time and improved immunosuppression means. The outcome of renal transplantation in amyloidsosis is comparable to that in diabetes and only slightly inferior to the outcome in primary renal disease.

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