

*Original Article*

## Complications in the Kidney Transplanted Patients Previously Treated by Peritoneal Dialysis - 10-Year Experience in a Single Center

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**Abstract**

**Background.** The aim of this study was to review the complications and renal functions in the kidney transplanted (KTx) patients previously treated by peritoneal dialysis.

**Method.** Retrospective analyses in period from Jan1996-Dec 2006 included 35 pts with KTx. The etiology of ESRD was: glomerulonephritis in 23 (65%), diabetes mellitus in 7 (20%), juvenile nephronophthisis in 2 (6%), VUR, kidney hypoplasia and Sy Good Pasture in 3 separate cases. We followed: graft survival, development of early and chronic complications and the renal function.

**Results.** Early surgical complications were: thrombosis of the renal artery and the early loss of graft occurred in 6 pts (17,1%), bleeding in 5 pts. (14,2%), hematoma in 4 pts.(11,4%), lymphocele in 5 pts.(14,2%).Renal function was delayed in 5 pts (14,2%), 9 pts (25,7%) with acute rejection. There wasn't any case of peritonitis. Chronic complications were: 4 (11,4%) chronic rejection with 1 (2,8%) loss graft and 3 (8,5%) urethrostenosis. As for infections, we found 4 (11,4%) bacterial infections and 9 (25,7%) reactivation of CMV. The recurrence of the disease occurred in 2 (5,7%) pts. The stable medium level m creatinine/s was 125, 76+ 12, 3 umol/l in the begining and 135, 24+14, 1 umol/l in the final phase of the monitoring. The medium level of glomerular filtration rate was 63,80+6,1 ml/min in the early phase and 62,47+7,2 ml/min in its final phase.

**Conclusion.** Surgical (vascular) complications more frequently occurred in patients with diabetes mellitus. There wasn't any case of peritonitis reported most probably because the peritoneal catheter was removed during the procedure. The largest number of pts managed to maintain the stable graft function throughout the whole monitoring period.

**Key words:** complications, graft survival, peritoneal dialysis, transplantation

**Introduction**

There is still a lot of controversy over the approach which of treatment modalities of the end-stage renal disease peritoneal dialysis (PD) and hemodialysis (HD) is more favorable before kidney transplantation. [1-3]. Peritoneal dialysis was introduced into practice as a pre-transplant treatment modality 20 years ago and hemodialysis more than forty years. Progress made in the field of surgical treatment and in the management of immunosuppressive

therapy allowed a good control over potential complications such as graft thrombosis, delayed graft function, acute and chronic rejection, the occurrence of peritonitis and other infections developing in the post-transplantation period.

Peritoneal dialysis is a good choice as a first treatment modality for the patients with end stage renal disease who have living donors. These patients have mild form of anemia, better urine output, lower exposure to the hepatitis viruses and satisfactory rehabilitation. Many authors couldn't find differences between PD and HD patients according to the postoperative complications [4-6].

**Patients and methods**

In the period from January 1996 to December 2006, 213 kidney transplantations were performed at the Nephrology Clinic, Military Medical Academy in Belgrade. Out of those 213 transplantations, 35 (16,4%) were done in PD patients (21 (60%) male and 14 (40%) female pts aged 33,37+4,1 on average). They were monitored for the 5 to 95- month period (52,2 months on average). The quadruple immunosuppressive therapy with ATG, MMF, KS, CS vs Tac was applied n 19 (54%) of cases, while in the other 16 (45%) pts, the triple therapy with MMF, KS, CS or Tac was introduced. The graft and patient's survival, occurrence of early and chronic complications and the renal function were monitored with serum creatinine and glomerular filtration rate.

**Results**

Retrospective analyses were conducted in 35 pts. The underlying diseases causing renal insufficiency were glomerulonephritis reported in 23 (65%) cases, diabetes mellitus in 7 (20%) cases, and juvenile nephronophthisis in 2 (6%) cases while VUR, kidney hypoplasia and Sy Good Pasture were identified in 3 separate cases. According to those underlying diseases, glomerulonephritis and diabetes mellitus were found to occur in the largest percentage while the percentage of occurrence of the other reported diseases was much smaller. Having in mind the fact that we don't have the developed deceased donor network, living donor TxS make up the largest percentage of all the performed transplantations. The percentage of deceased TxS was only 14 (5 TxS) and as of the living donor kidney TxS, it was 86 (30TxS). A peritoneal catheter was removed during the procedures in all the cases.

The early surgical complications included thrombosis of the renal artery, bleeding and hematoma of the lymphocele out

of which renal artery thrombosis occurred in the largest percentage of patients (17,1%) mainly diagnosed with diabetes mellitus. Due to those renal artery thromboses, kidney explantation was required to be done. The percentage of the other complications that developed was substantially smaller, among which bleeding occurred in 5 patients (14,2%) hematoma at the surgical site in 4 patients (11,4%) and lymphocele in 5 patients (14,2%). Eighteen reinterventions were required to be performed.

Early complications associated with the graft function and rejections by the recipients were expected to develop. Delayed graft function occurring in 14, 2% of cases (5 pts.) required placement of CVK and introduction of hemodialysis. The acute rejection occurred in 25, 7% of cases (9 pts.). There was not any case of infectious complications such as peritonitis, most probably due to the fact that the peritoneal catheter was removed during the transplantation procedure.

In the course of monitoring period, a slightly smaller percentage of chronic complications was reported to occur such as chronic rejection (4 pts - 11, 4%), loss of graft (1 pts -2,8%) and urethrostenosis (3 pts - 8,5%).

Within that period, 11,4% of bacterial infectious associated with the urinary tract developed more frequently in patients with diabetes mellitus. The germs mostly isolated were E-coli, Klebsiela and Enterococcus. CMV infections recurred in 25,7 % of cases out of which 5 were patients receiving quadruple immunosuppressive therapy and were efficiently treated with antibiotic and antiviral and carefully corrected immunosuppressive therapy (Table 1, Table 2).

**Table 1.** Early complications - frequency rate

Complications	Frequency number	Frequency %
thrombosis	6/35	17,1%
bleeding	5/35	14,2%
hematoma	4/35	11,4%
lymphocele	5/35	14,2%
delayed graft function	5/35	14,2%
acute rejection	9/35	25,7%
peritonitis	0/35	0 %

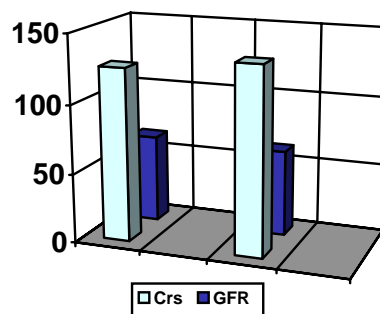
**Table 2.** Late complications - frequency rate

Complications	Frequency number	Frequency %
chronic rejection	4/35	11,4%
graft loss	1/35	2,8%
urethral stenosis	3/35	8,5%
bacterial infections	4/35	11,4%
reactivation CMV inf	9/35	25,7%

Recurrence of the disease was reported in 2 pts (5,7%) and was associated with membrane-proliferative GN and IgA glomerulonephritis. Three patients underwent retransplantation due to the loss of graft.

During the follow up no one died. On the basis of the mean level of serum creatinine as the kidney function parameter, it could be observed that there was no statistically significant differences in the initial (125, 76+12, 3 umol/l) and the final phase (135, 24+14,1 umol/l) of the monitoring period. It indicated that the stable graft function was maintained throughout the whole monitoring period. It was also confirmed by monitoring the blood levels of

glomerular filtration rate (GFR) and no statistically significant differences were found in the initial (63,80+6,1 umol/l) and the final phase (62,47+7,2 umol/l) of the monitoring period. (Figure 1).



**Fig. 1.** The medium level of cretinine and GFR measured in the initial and the final phase of the monitoring period

**Discussion**

The impact of the pre-transplantation treatment modality of the terminal renal insufficiency on the development of postoperative complications, function, infections and graft survival represents the subject of interest of many nephrologists. For a long time, the opinion was controversial, but an approach that the peritoneal dialysis as the first treatment modality is as good choice of treatment as hemodialysis has prevailed nowadays [1-8]. Some authors indicate that the peritoneal dialysis is a good treatment modality for the patients with the insufficiency of the transplanted kidney [9].

Vascular thrombosis was reported as characteristic early postoperative complications occurring in that group of patients.

But studies of many authors indicated that there weren't any significant differences in the transplantation outcome identified in the groups of PD patients as compared with the group of HD patients (3,47% -41% in the PD group and, 1,9%-30% in the HD group [5,7,10]. Renal artery thrombosis occurred in 6 patients (17,1%). Most of patients were insulin dependent diabetics (4/6) with advanced arteriolosclerosis. During the operation surgeons performed endarterectomy of internal iliac artery before they made anastomosis with renal artery. Immediately after transplantation we didn't found flow through renal artery with color Doppler sonography and selective angiography, so we had to perform graft nephrectomy.

The frequency rate of acute graft rejection occurring in both PD and HD groups of patients didn't differ to a greater extent. Based on the published data, 27 - 49, 2 % of rejection reactions were reported in the PD group of patients and 27-43, 6% in the HD group [7,8]. In our PD group of transplanted patients, the acute graft rejection occurred in 25, 7% of cases. Experiences of our Center indicated that the graft survival rate in this group of patients during the monitoring period was 75% what correlated with the data obtained by other authors (5-year survival period among CAPD patients was reported in 61-67% of cases while that percentage ranged from 63-66% among HD patients [11,12].

The delayed graft function was identified in 12-30% of PD patients and in 16-50,4 % of HD pts. [7,11,13]. Within our group of patients, 14,2 % of them was reported to have delayed graft function treated by the short-term hemodialysis.

Infections always represented the types of complications most often occurring in PD patients but, recently there is a great number of studies indicating the contrary. So, Vanholder, *et al* described that no significant differences were found in those two Tx groups of patients in relation to surgical complications and infections and, recommended PD as a therapy of choice in cases of patients indicated for transplantation [13].

Infections complications occurring in the first days after transplantation were described in 67% of PD pts and in 25, 9% of HD pts. Those infections were mainly caused by microorganisms colonizing the skin and, according to the site of the infection, they were intra-abdominal and the infections occurring on the peritoneal catheter site. It, of course, interfered with the recovery in the early post-transplanted period, then prolonged the patient's hospitalization and substantially affected the graft survival [14]. Contrary to those infections, frequency rate of the urinary tract infections, infections associated with intravenous and intra-arterial lines and other sites as well didn't differ in those groups of PD and HD patients [14]. By introducing this technique of removing the peritoneal catheter during the surgical procedure, we managed to prevent any episodes of peritonitis in the post-transplantation period.

### Conclusion

This study shown that surgical (vascular) complications occurred more frequently in patients with diabetes mellitus. There wasn't any case of peritonitis reported most probably due to the removal of peritoneal catheter during the Tx procedure. Careful dosing of immunosuppressive drugs particularly in diabetes patients could reduce the occurrence of urinary tract infections and reactivation of CMV. The largest number of patients maintained the stable graft function throughout the whole monitoring period

*Conflict of interest statement.* None declared.

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