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Preemptive Kidney Transplantation

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1. Introduction

End-stage renal disease (ESRD) is a severe health problem with high mortality and morbidity rates and growing incidence worldwide. Recently, two main renal replacement therapy modalities have been used for ESRD patients: Dialysis and kidney transplantation. It is undoubtedly clear that transplantation is the best choice for long term survival and every transplantation candidate is also a preemptive transplantation candidate.

Preemptive kidney transplantation(PKT) may be summarized as transplantation before the commencement of dialysis in ESRD patients. Preemptive transplantation confers a significant benefit in terms of both patient and allograft survival. The benefit thought to be the result of avoidance of cardiovascular adverse effects of long term dialysis. Current opinion allows ESRD patients to receive PKT when their GFR is 20 mL per minute or less and preparation for transplantation should be started at the time of the diagnosing chronic renal disease.

Kidney transplantation should be the choice of therapy in ESRD patients not only because of improving graft and patient survival and also preventing dialysis related comorbidities and lower cost in the long term(1,2,3). New and more effective immunosuppressive drugs, growing experience in transplantation surgery are making kidney transplantation a more common and safe option.

Although there are studies showing nephrologists have the same opinion that preemptive transplantation is the best treatment modality for eligible ESRD patients, that has been convincingly shown to improve posttransplant graft and patient survival. Unfortunately, while PKT is much more beneficial over transplantation, preemptive kidney transplantation seems to be underutilized specially as a result of late referral of the patients to a nephrologist and transplantation center. Only 2% of ESRD patients receive PKT while one forth of transplantation procedures are preemptive in children in the USA. Of course, there are other difficulties for PKT such as poor health status, lack of compliance, comorbidities, older patients, longer waiting time for deceased kidney donors and lack of social insurance. Ideally, preparation for transplantation should be initiated as soon as progressive chronic kidney disease (CKD) is recognized because cardiovascular morbidity and mortality rates increases while CKD progresses. Early referral to a nephrologist has a vital importance in this situation. Unfortunately, just about 50% of CKD patients come upon a nephrologist in end stage of chronic renal disease. Early referral not only allows careful preparation for PKT and also evaluation of potential living donor candidates and selecting the exact time for transplantation. Because the course of CKD varies according to the primary disease, earliest referral is synonymous to early preparation and beter outcome for transplantation.

GFR 20 mL per minute or less is widely accepted to be the time for preemptive kidney transplantation regardless of the etiology of the kidney disease. Diabetic CKD patients should also be evaluated for pancreatic islet cell transplantation. Kidney biopsy may be helpful for potentially recurring primary kidney diseases after transplantation. A living kidney donor enhances the chance for PKT but deceased kidney donor may be an alternative that should not be failed to remember and all patients should be added to waiting list when GFR decreases under 20 mL per minute. Previously transplanted patients may also be candidates for another PKT.

Recent studies show that preemptive transplantation has better outcomes than non-preemptive transplantation. Lower infection, lower hypertension and less acute rejection episode rates in preemptive transplant patients may be the main reasons for these results. PKT allows preventing from complications during hemodialysis, higher hemoglobin levels before transplantation, lower cardiovascular disease and coronary artery calcification rates, better consistency to immunosuppressive therapy and better life-quality. Long term graft and patient survival are two major motivators for PKT.

Although kidney transplantation has many advantages against other therapeutic approaches, has its own problems. While kidney transplantation becomes more prevalent, post transplant problems growing as well and transplant recipients becomes a "special patient group". Minimizing the problems of this "special patient group" is a significant target and may only be achieved by proper choice of recipients, appropriate preparation and finally exact timing of transplantation.

Is preemptive kidney transplantation exact time of transplantation? Until mid 80's preemptive transplantation has been thought to have worse results than non preemptive (4,5). But after 90's more recent studies referred just the opposite (6,7). Currently, the question still remains controversial for nephrologists.

Both in Turkey and in the world, widening of transplantation centers and experienced surgeons and nephrologists PKT has become a more common option. Specially in stage 3 and stage 4 CKD patients early referral to a transplantation center carries a high importance for long term survival.

In USA, PKT constitute 25% of living donor transplantations and 10% of deceased donor transplantations, while the rates are 34% and 14% for children recipients respectively (8,9). PKT in children has better percentages because of family relationships, easier to find a donor for children and probably more doubt of adult nephrologist for PKT (10).

PKT offers preventing dialysis related co-morbidities. Approximately 20% of hemodialysis patients have been hospitalized for vascular access problems and 50% has catheter infections per year. In addition prolonging of hemodialysis process results irreversible cardiovascular problem even after transplantation (7,11). PKT has better outcomes for both post transplant graft and patient survival and also co-morbidities happening during a dialysis period (10,11).

Mange et al showed improved graft survival of PKT in 8481 living donor transplantation with 52% decrease for graft loss for PKT over non preemptive (12). Kasiske et al found similar results for both living and deceased donor transplantation (13). Chronic allograft nephropathy rates are lower for PKT (14). Some investigators suggest that improved graft survival in PKT patients is a natural result of better patient survival of selected patients for PKT. Besides other factors for graft survival are similar (15).

It is clear that prolongation of dialysis period in non-preemptive transplantation may result irreversible complications such as cardiovascular disease, renal allograft vascular disease,

malnutrition, chronic inflammation, impaired immunologic functions and inadequate clearance in ESRD patients (16,17). Immun system impairment may cause unavoidable infections during dialysis period (18,19,20). Non-preemptive transplantation patients expose to dialysis membranes that may cause activations in immun system which may even cause acute rejection (21,22,23). Hypertension and left ventricular hypertrophy are more common in nonpreemptive group because of the interdialytic weight gain.

Kidney transplantation should be the first choice in ESRD patients. PKT may be termed as *crème de la crème* and should never be underestimated. Preparation for transplantation should be initiated at the time CKD has been diagnosed and every CKD patient should be accepted as a candidate for PKT for better survival and life-quality.

2. Results and offers

Every CRD patient is a candidate for PKT.

PKT is an important alternative to avoid from dialysis related co-morbidities and complications.

PKT has improved graft and patient survival rates over non preemptive KT.

Early referral to a transplantation center allows proper choice of recipients, appropriate preparation and finally exact timing of transplantation.

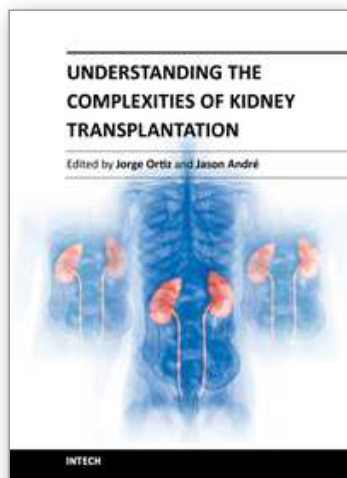
PKT offers lower infection rates, lower cardiovascular disease and better life quality.

Every transplantation candidate is also a preemptive transplantation candidate.

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Kidney transplantation is a complex field that incorporates several different specialties to manage the transplant patient. This book was created because of the importance of kidney transplantation. This volume focuses on the complexities of the transplant patient. In particular, there is a focus on the comorbidities and special considerations for a transplant patient and how they affect kidney transplant outcomes. Contributors to this book are from all over the world and are experts in their individual fields. They were all individually approached to add a chapter to this book and with their efforts this book was formed. Understanding the Complexities of Kidney Transplantation gives the reader an excellent foundation to build upon to truly understand kidney transplantation.

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