

A FOUR-YEAR RETROSPECTIVE OBSERVATIONAL STUDY OF THE OUTCOME OF DECEASED DONOR KIDNEY TRANSPLANTATION- A SINGLE CENTRE STUDY

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ABSTRACT

BACKGROUND

The aim of the study is to study the outcome of deceased donor kidney transplantation at the end of one year, the effect of cold ischaemia on the outcome of graft survival and the role of various induction agents in the prevention of acute rejection.

MATERIALS AND METHODS

A retrospective observational study of 30 deceased donor kidney transplant recipients was conducted. All patients received triple drug immunosuppressive treatment, i.e. tacrolimus, steroids and mycophenolate. Induction with either ATG or basiliximab was given to all recipients. The graft function was monitored serially with serum creatinine and routine urine examination. Graft biopsy was done in the event of graft dysfunction. Development of infection was confirmed by serological examination and cultures of various body fluids.

RESULTS

One year graft survival was 80% and patient survival was 83%. Delayed graft function was seen in 30% and acute rejection in 33%. Cold ischaemia was more than 6 hours in 23%. Induction was given to all patients and graft function was similar in both groups. 40% patients developed infection during the first year.

CONCLUSION

One year graft survival is 80% and patient survival is 83%. 40% patients developed infection.

KEYWORDS

Deceased Donor Kidney Transplantation, Cold Ischaemia Time, Delayed Graft Function.

HOW TO CITE THIS ARTICLE: Puthiyotti NT, Krishnan JE, Meleladathi S. A four-year retrospective observational study of the outcome of deceased donor kidney transplantation- A single centre study. J. Evid. Based Med. Healthc. 2016; 3(94), 5148-5152. DOI: 10.18410/jebmh/2016/1076

BACKGROUND

For various reasons, renal transplantation is the ideal treatment of end-stage renal failure. The shortage of the organ is the main obstacle for the transplant program. The deceased donor transplantation has resolved this issue to a certain extent. One of the major risk factor for delayed graft function is prolonged cold ischaemia time and the induction with either ATG or basiliximab prevent the acute rejection in many posttransplant recipients. All patients received triple drug immunosuppressive treatment, i.e. tacrolimus, steroids and mycophenolate. This study was conducted to evaluate the outcome of deceased donor transplantation in our centre.

MATERIALS AND METHODS

The study was conducted in the Department of Nephrology of Government Medical College, Kozhikode. This was a cross-sectional observational study. 30 patients who underwent deceased donor transplantation since 2012 were studied. The clinical profile, which include details regarding native kidney disease, cold ischaemic time, intraoperative complications, posttransplant issues like acute rejection, infections and other non-immunological complications were collected and analysed. Induction treatment was given to all patients. Graft function was monitored serially with renal function tests and urine analysis. Renal biopsy, immunofluorescence of renal tissue and sonological study of graft were done in the presence of graft dysfunction. Culture of various body fluids, immunological markers of various opportunistic infection and radiological evaluation were done to confirm the diagnosis of infection. Complete blood counts, liver function tests, blood sugar and serum cholesterol were done routinely for all patients after discharge. The follow up of patients were done as per the guidelines.

Financial or Other, Competing Interest: None.

Submission 21-10-2016, Peer Review 01-11-2016,

Acceptance 21-11-2016, Published 22-11-2016.

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DOI: 10.18410/jebmh/2016/1076

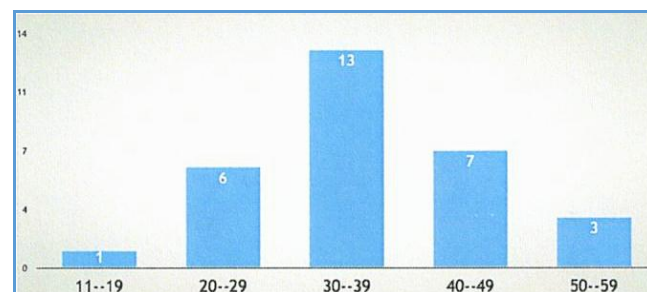


RESULTS

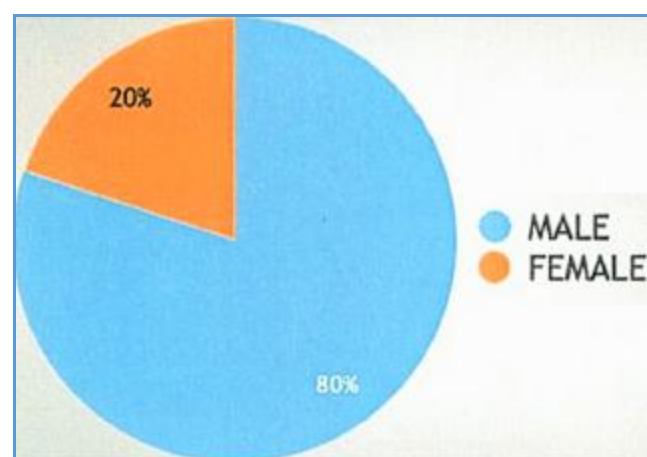
Age group of the study population varied from 11 years to 60 years with 13/30 (43%) belonging to 30 to 39 years, 7/30 (23%) belonging to 40 to 49 years, 6/30 (20%) belonging to 20 to 29 years, 3/30 (10%) belonging to 50 to 59 years and one patient below one year (Graph 1). Male-female ratio 4:1 (Graph 2). The cause of renal failure include chronic glomerulonephritis in 15/30 (50%), chronic tubulointerstitial nephritis in 6/30 (20%), diabetes 5/30 (17%), ADPKD 2/30 (6%), Alport syndrome 1/30 (3%), solitary kidney 1/30 (3%) (Graph 3). Induction was given to all patients. Antithymocytic globulin was given to 15/30 patients and basiliximab was given to 15/30 patients (Graph 4). Excellent graft function was seen in 12/30 (40%) patients, delayed graft function seen in 9/30 (30%) patients and slow graft function in 9/30 (30%) patients (Graph 5). Rejection was seen in 10/30 (33%) patients, acute tubulointerstitial damage in 7 (23%) patients and CNI toxicity in one patient (3%). 4/10 (40%) patients had antibody-mediated rejection (AMR), 4/10 (40%) patients had T Cell-Mediated Rejection (TCMR), 2/10 (20%) patients had AMR and TCMR (Graph 7). Early rejection was seen in 6/10 (60%) patients and late rejection was seen in 4/10 (40%) patients (Graph 6). Plasmapheresis and IVIG were given to patients with AMR and one patient was treated additionally with bortezomib. All patients except one improved very well and was discharged with normal creatinine. One patient continued to be on maintenance haemodialysis. All TCMR patients were treated with IV methylprednisolone and one patient was given a course of ATG and all patients improved and was discharged with normal creatinine (Graph 9). The recipients with combined AMR and TCMR were treated with combination of IVIG, ATG and plasmapheresis and was discharged with normal creatinine (Graph 10). Early graft dysfunction is seen in 40% (12) and late graft dysfunction is seen in 60% (18) of patients (Graph 11). Haemodialysis was given to 10 patients out of 30 (33%), 7 patients survived in 3/7 (42%) had acute rejection and 4/7 (58%) had acute tubular necrosis. 5/7 (71%) patients improved with treatment and dialysis was stopped and 2 patients one from each group continued to be on haemodialysis.

The cold ischaemic time varies from 4 to 16 hrs. (Graph 12). It was more than 6 hours in 7 patients. Normal graft function was seen in 3/7 (42%) patients, slow graft function was seen 1/7 (16%) patients and DGF was seen in 3/7 (42%) patients and all DGF patients had acute rejection (Graph 13). The cold ischaemic time was less than 6 hours in 23 patients and normal graft function was seen in 8 patients (35%), 8 patients (35%) had slow graft function and 4 (17%) patients had delayed graft function, 3 patients died (13%). In all patients, DGF was due to ATN. Infection was seen in 12/30 (40%) patients (Graph 8). UTI was most common in 6/12 (50%), CMV infection was seen in 2 patients (16%) (Graph 15). One patient each had bacterial pneumonia, aspergillosis, tuberculosis and mycosis. The other complications included renal artery stenosis in one patient, renal vein thrombosis in one

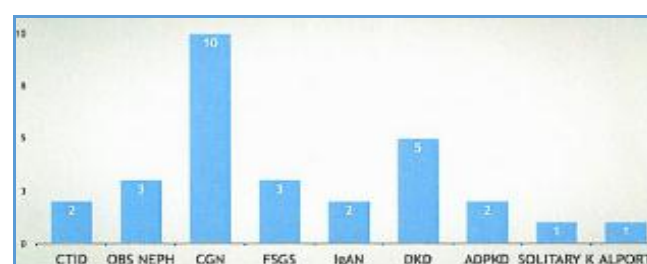
patient, foot drop in two patients and posttransplant diabetes in two patients (Graph 16). At the end of the year, 10% patients died, 7% patients on maintenance dialysis and 83% patients have normal renal function (Graph 17). At the end of one year, 5 patients died (Graph 18). The patient survival is 83% and 24 patients have normal graft function and graft survival is 80% (Graph 19).



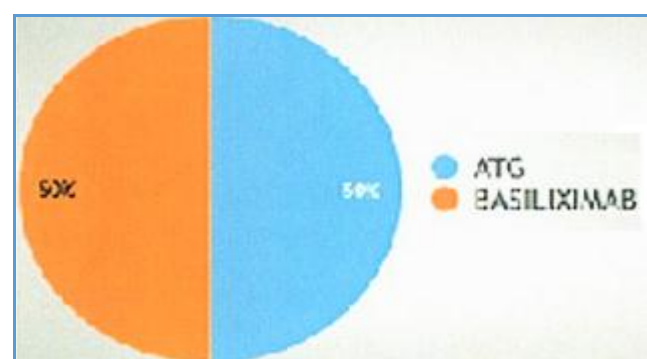
Graph 1. Age Distribution



Graph 2. Sex Distribution



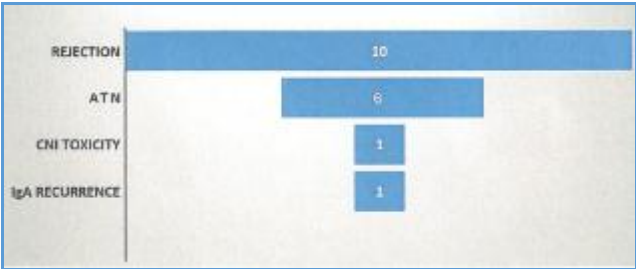
Graph 3. Native Kidney Disease



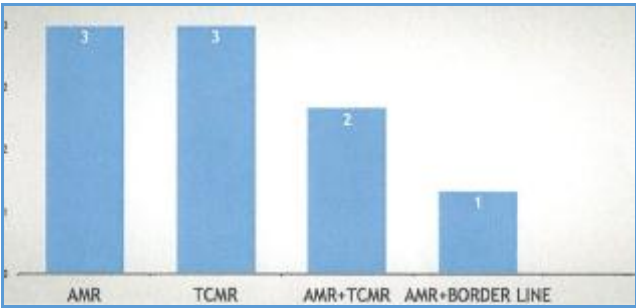
Graph 4. Induction Agent



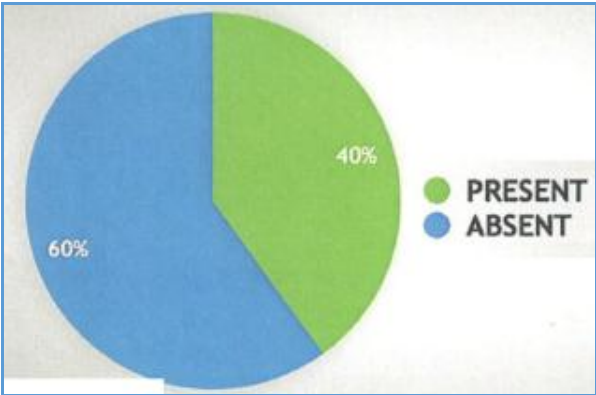
Graph 5. Graft Function



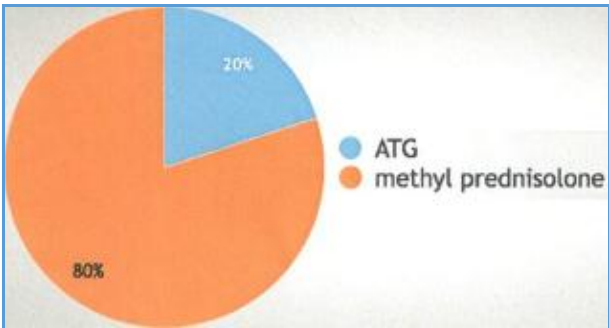
Graph 6. Graft Dysfunction



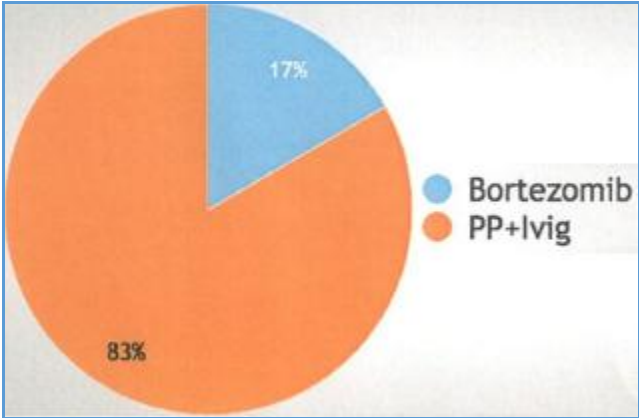
Graph 7. Types of Graft Rejection



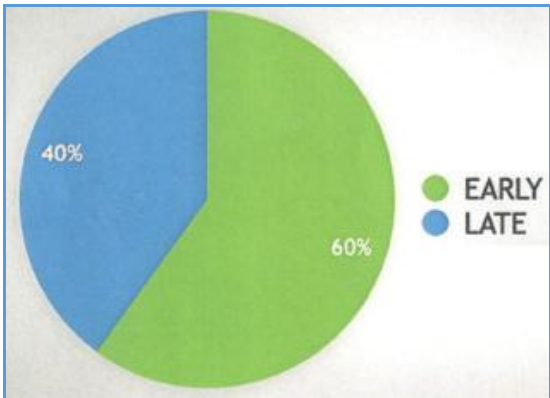
Graph 8. Infection



Graph 9. Treatment of TCMR



Graph 10. Treatment of AMR



Graph 11. Onset of Graft Dysfunction

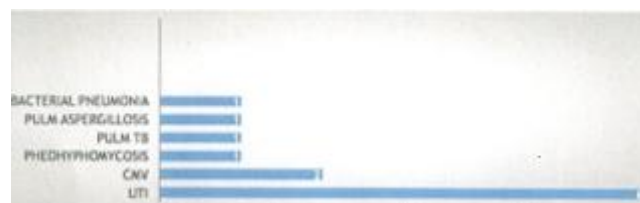
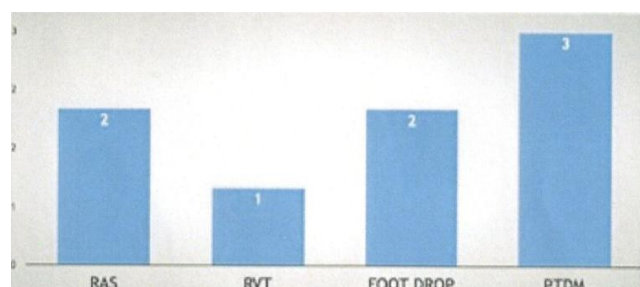
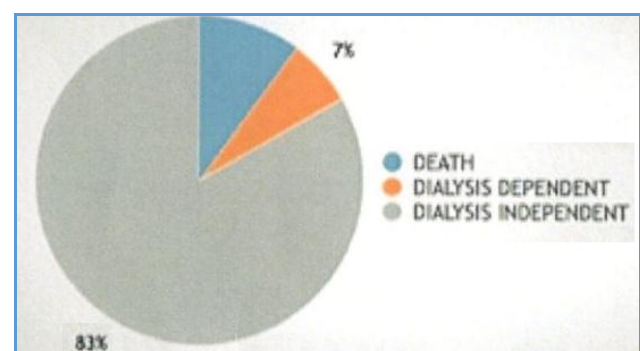
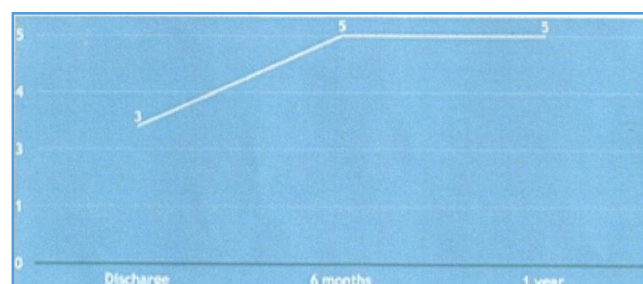
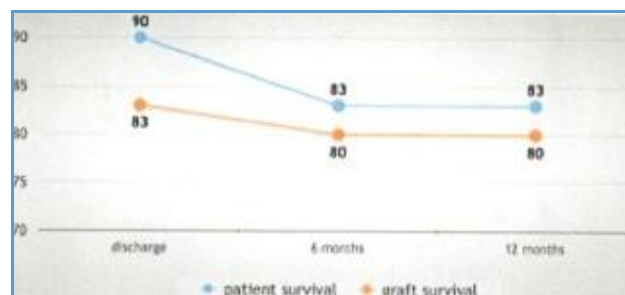
Cold ischemia time -DGF	Mann-Whitney U test	0.110
Cold ischemia time-rejection	T test	0.628
Cold ischemia time- SGF	T test	0.829

Graph 12. Prevalence of Cold Ischaemic Time

Variable	Test	p value
Sex	Chi-square	0.119
Age	Chi-square	0.441
DM	Chi-square	0.330
CAD	Chi-square	0.684
HTN	Chi-square	0.552
Native kidney disease	Chi-square	0.524
Intra operative	Chi-square	0.739
DGF	Chi-square	0.076
Rejection	Chi-square	0.693
Rejection category	Chi-square	0.667
PTDM	Chi-square	0.629
Infection	Chi-square	0.553
Induction agent	Chi-square	0.598

Graph 13. Mortality

Variable	TEST	p value
Rejection - infection	Chi-square	0.041
Rejection category- infection	Chi-square	0.317

Graph 14. Rejection**Graph 15. Infections****Graph 16. Other Complication****Graph 17. Mortality and Morbidity****Graph 18. Mortality****Graph 19. Graft and Patient Survival**

DISCUSSION

In our study, 40% had normal graft function, 30% had slow graft function and 30% had delayed graft function at the end of one week of transplantation. Previous study by Humar A et al showed similar results with normal graft function in 47% patients, 27% with slow graft function and severe graft function in 26% patients.^{1,2} Jeo Hynn Park also showed similar results with 49% patients with normal graft function and 51% patients with abnormal graft function.³

Our study showed graft dysfunction in 60% of patients and 56% of graft dysfunction is due to acute rejection. 44% graft dysfunction due to other causes like acute tubular necrosis, CNI toxicity, recurrence of primary glomerular disease and infection. The earlier study by Devadas also showed similar results and 60% of graft dysfunction was due to acute rejection and 40% of graft dysfunction was due to CNI toxicity, recurrence of primary glomerular disease, acute tubular necrosis and infection.⁴

Histopathological pattern of acute rejection in our study showed that antibody-mediated rejection occurred in 50% of recipients, T cell-mediated rejection in 30% of patients and combined antibody mediated and T cell-mediated rejection in 20% of recipients. The earlier studies also showed similar results and antibody-mediated rejection was 87% and T cell-mediated rejection was 13%. No mention about combined rejection.

At the end of one year, 5 patients died of various reasons, 25 patients survived and the patient survival is 83% in our centre. The UNOS data also showed that one year patient survival is 90%. A study published by Prabakar in 2008 also showed one year patient survival is 88%.⁵ Regarding the graft survival in our centre, 24 patients had good graft survival and the rate is 80%. The UNOS data showed that 1 year graft survival was 89%. In Chennai centre, the graft survival was 73.5% and our results are almost similar to previous studies.⁶ 12/30 patients had h/o infection and 58% patients had bacterial infection, 17% patients had viral infection, 17% patients had fungal infection and 8% patients had mycobacterial infections. Study by Patricia Munoz showed that 47% infections are bacterial, viral infections account for 50% and fungal infections in 3%.⁷

CONCLUSION

Following deceased donor kidney transplantation, the patient survival in our centre is 83% and graft survival is

80%. DGF is more common among patients with prolonged cold ischaemia. Acute rejection was seen in 33% patients and infection was seen in 40%.⁸

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