Global Academic Journal of Medical Sciences

Available online at www.gajrc.com
DOI: 10.36348/gajms.2023.v05i04.001

OPEN ACCESS

ISSN: 2706-9036 (P)
ISSN: 2707-2533 (O)

Original Research Article

Live Related Kidney Transplantation: Experience of 360 Patients in a Tertiary Care Hospital of Bangladesh

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Article History
Received: 11.05.2023
Accepted: 18.06.2023
Published: 07.07.2023

Abstract: ***Background*:** Live related kidney transplantation is the most preferred form of renal replacement therapy worldwide including Bangladesh. However, it is challenging and also rewarding both for patients and treating physicians. BSMMU hospital has given maximum effort for its greater success. The aim of this study was to share our ten years' experience regarding some aspects of live related renal transplantation. ***Methods*:** This retrospective study was conducted in nephrology department of BSMMU hospital from January 2002 to December 2015. Data were collected from hospital records and some previously conducted study on these transplant recipients. ***Results*:** A total of 360 live related kidney transplant recipients were evaluated during this period. Recipients Male: Female ratio was 1.57:1. Mean age of recipients were 39.58 ± 10.46 years. The causes of ESRD were chronic glomerulonephritis 220(61.60 %), diabetic nephropathy 58(16.24%), hypertensive nephrosclerosis 22 (6.16 %), chronic interstitial nephritis 11 (3.08 %), SLE 10(2.8%), ADPKD 6(1.68 %), unknown 19(5.32 %). Most of the donors were mother (21.84% %) followed by spouse mostly wife (20.44%) and sister (18.76 %). Almost all recipients were on MHD 352(97.78%), 2 were on CAPD and 06 were pre-emptive transplantation. Triple immunosuppressive protocol Cyclosporine or Tacrolimus, MPA or Azathioprine and Prednisolone were used in each patient. Recipients with poor HLA matching received Baciliximab in standard dose. CMV prophylaxis was given in selected patients and each patient received pneumocystis jirovecii prophylaxis. Common complications during post-operative period were ATN 41(11.48%), DGF 23(6.44%), Acute rejection 50(14%) and infection mainly urinary tract infection 46(12.88%) and RTI 14(3.92) followed by wound infection and other surgical complication. Presence of BK virus infection was studied in 29 transplant recipient and it was found to be positive in 6(20.7%) cases. Protocol biopsy was done in 37 transplant recipient in the 2008-2009 on day 14, and day 90 to see subclinical rejection and early graft dysfunction. On day 14th biopsy report showed 21(56.7%) normal histology, 5(13.5%) had subclinical rejection, 5(13.5%) had

clinical rejection, 4(10.8 %) developed ATN, 2(5.2 %) cyclosporine toxicity, and report at 3 month showed normal histology 18(48.60%), subclinical rejection 7(18.90%), clinical rejection 5(10.80%). Leading cause of chronic allograft dysfunction was chronic allograft nephropathy (CAN) 60(19.80%) followed by chronic cyclosporine toxicity 37(12.21%) and de-novo or recurrent glomerulonephritis. Mean post-transplant hospital stay was 18.46 ± 5.56 days. Mean duration of normalization of serum creatinine after surgery was 7.38 ± 3.88 days. At discharge 74.40% patients had normal renal function with mean serum creatinine 1.10 ± 0.26 mg/dl and 21.34% patients showed gradual improvement of renal function with mean serum creatinine 2.12 ± 0.97 mg/dl. In our study 1 year and 5 years' graft survival was 93.88% and 75.16% respectively and 1 year and 5 years' patient's survival was 346(96.08%) and 290(81.2%). ***Conclusion*****:** Our report shows that short and long term graft and patient survival is encouraging and comparable to other centers of both developing and some developed countries with limited resources and facilities.

Keywords: Live related renal transplantation, Graft survival, Allograft dysfunction.

INTRODUCTION

With rising prevalence of chronic diseases such as diabetes mellitus and hypertension, the prevalence of ESKD is increasing [1]. CKD is the leading cause of death in United States [2]. Transplantation always is preferred over dialysis for most of the patients. First successful renal transplantation was done in 1954 between identical twins by surgeon Joseph E. Murry and John Hartwell Harrison, in collaboration with nephrologist John P. Merrill in Peter Bent Brigham Hospital at Boston [3]. Live related renal transplantation was started in BSMMU (the then IPGMR) in1994 at a regular basis. We have performed 360 live related renal transplantations here in last thirteen years (2003-2019). The aim of this study is to share our experiences and findings of last thirteen years.

METHODS

A total of 360 live related Renal Transplantation surgery were performed from January 2002 to December 2015. Age range was 18-60 years. During this period of transplantation, a consent was taken from all patients regarding data preservation during their follow up and use of this data without disclosing the patient's identity for research purposes. Data were collected in preformed questionnaire from the record book and also from some study reports done on some patients previously. Retrospective evaluation was done from clinical and lab findings. In our center immunosuppressive protocol consisted of triple drug therapy - Cyclosporine / Tecrolimus, Mycophenolate Mofetil /Azathioprine and prednisolone along with Inj. Methyl prednisolone 500 mg on day 0, 1 and 2. Il-2 receptor blocker Baciliximab was used in selected patients those who had poor HLA matching. CMV prophylaxis was given in selected patients and each patient received pneumocystis jirovecii prophylaxis.

RESULT

In last twelve years 360 live related renal transplantation were done. Out of them 220(61.60 %) were male and 140(39.20%) were female transplant recipient. The mean age of recipients was 39.58 ± 10.46 (Age range 18-65 years) and donor were 34.37 ± 10.46 (Age range 18-60 years). Most of the donors were female 274(76.72 %). Regarding the relationship of donor most were mother 78(21.84%) followed by wife 73(20.44% and sister 67(18.76%). The cause of ESRD were chronic glomerulonephritis 220(61.60%), diabetic nephropathy 58(16.24%), hypertensive nephrosclerosis 22(6.16%), chronic interstitial nephritis 11(3.08%), SLE 10(2.8%), ADPKD 6(1.68%), Vasculitis 8(2.24%), CKDu 19(5.32 %). Almost all recipients were on MHD 352(97.78%), 2 were on CAPD and 6 were preemptive transplantation. Majority of patients were on follow up for up to 5 years and in each visit they were counseled to keep on F/U regularly as per protocol. In spite of that 59(16.4%) patients lost from F/U after 1 year of transplantation. Out of total 360 recipients 14 deaths were recorded within the first three months of transplantation due to various reasons mostly infection. Causes of early graft dysfunction and other complications where 41(11.48%) patients developed ATN, 23(6.44%) had DGF and 50(14%) patient developed acute rejection, 43(12.04%) patient developed different types of surgical complications whether 46(12.88%) had UTI with 34(9.52%) developed acute pyelonephritis. 14(3.92%) developed respiratory tract infection. Vascular complication developed in 9(2.52%) and

graft nephrectomy had to done in 2 patients. BK virus status was seen in 29 renal allograft recipient in 2014. BK virus was found to be positive in 6 patients - BK virus PCR in urine was positive in 5 and in blood and urine was positive in 1 patient. Regarding long term complication, NODAT was observed in 36(11.88%), Varicella zoster 34(11.22%), Tuberculosis 15 (4.95%), CMV disease developed in 10(3.3%) patients, recurrent UTI 6(1.98 %), pancreatitis 2(0.66 %), post-Transplant erythrocytosis 21(6.93%), post-transplant leucopenia 14(4.62%), Malignancy 3(0.99 %) -NHL, HCC, Kaposis sarcoma. We also observed the causes of chronic allograft dysfunction where chronic allograft nephropathy (CAN) was the leading cause 60(19.80%) followed by chronic cyclosporine toxicity 37(10.36%) and denovo or recurrent glomerulonephritis 23(7.59%) and 22(7.26%) respectively. In 15(4.95%) cases etiology could not be identified, 12(3.96%) were due to chronic urinary tract infection and 6(1.98%) due to obstructive uropathy. Protocol transplant kidney biopsy was done on 37 patients in the year 2008-2009 on day 14 and day 90 to see subclinical rejection, cyclosporine toxicity and other causes of graft dysfunction. On 14th day of biopsy, 21(56.7%) had normal histology, 5(13.5%) had clinical rejection, 5(13.5%) had subclinical rejection, 4(10.8%) developed ATN, 2(5.4%) developed cyclosporine toxicity. On the other hand, protocol biopsy at 90 days showed 18(48.60%) normal histology, 7(18.90%) subclinical rejection, 5(10.80%) clinical rejection, 2(5.40%) borderline change, 4(10.80%) cyclosporine toxicity, 1(2.70%) patient developed recurrent GN. Graft survival of our study and other study has been shown in Tab: 6. In our study 1 year and 5 years' graft survival was 93.88% and 75.16% respectively.

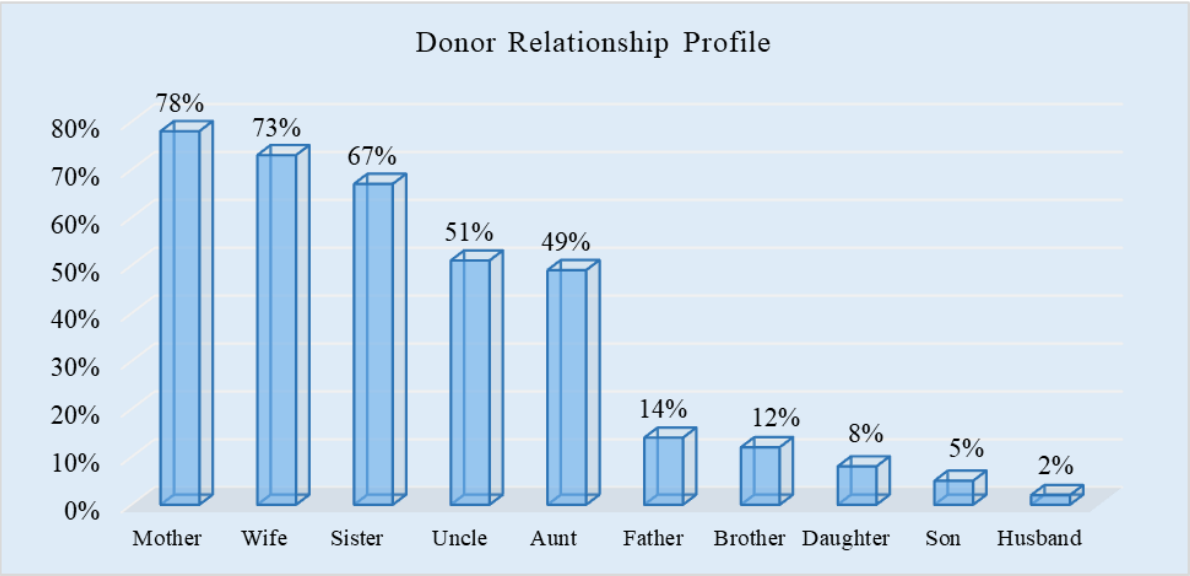

Figure I: Column chart showed Donor Relationship Profile (N=360)

Table 1: Cause of end stage kidney disease (N=360)

Chronic Glomerulonephritis	220(61.60%)
Diabetic Nephropathy	58(16.24%)
Hypertensive Nephrosclerosis	22(6.16%)
Chronic Interstial Nephritis	11(3.08%)
SLE	10(2.8%)
Vasculitis	8(2.24%)
ADPKD	6(1.68%)
Heriditary disease	4(1.12%)
VUR	2(0.56%)
CKDu	19(5.32%)

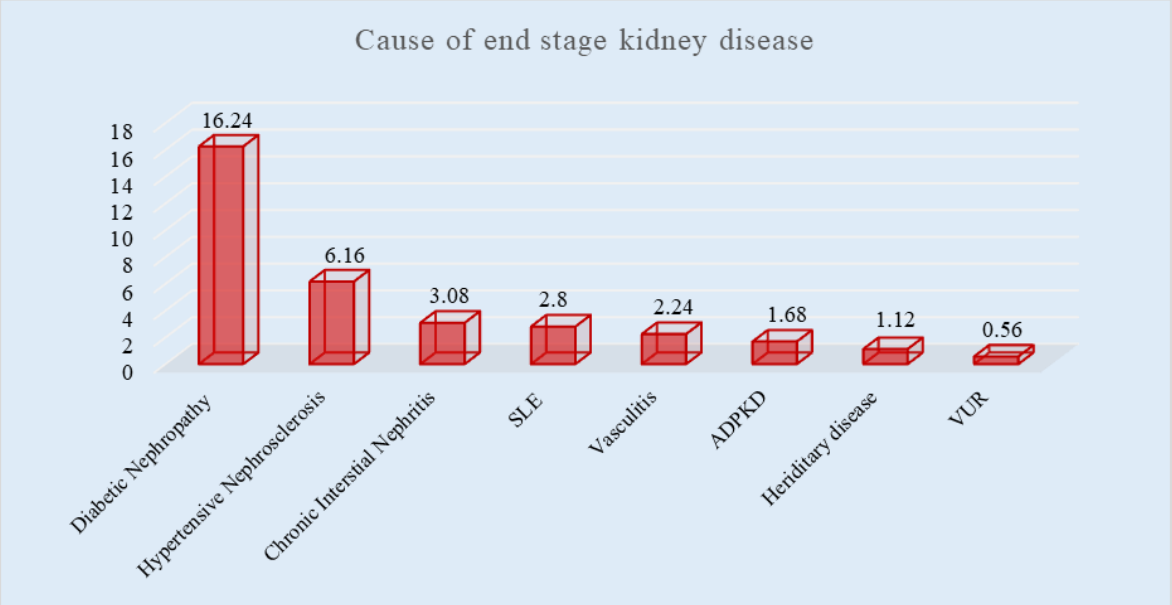

Figure II: Column chart showed cause of end stage kidney disease (N=360)

Table 2: Causes of early mortality (N=360)

Septicemia from wound infection	4(1.14%)
Septicemia from pneumonia	3(0.84%)
Septicemia from urinary tract infection	2(0.56%)
Acute Myocardial infraction	2(0.56%)
Septicemia from infective endocarditis	1(0.28%)
Disseminated fungal infection	1(0.28%)
Hemoperitonium	1(0.28%)

Table 3: Causes of early graft dysfunction and other complications (N=360)

Acute tubular necrosis	41(11.48%)
Delayed graft function	23(6.44%)
Acute rejection	50(14.0%)
Urinary tract infection	46(12.88%)
Acute pyelonephritis	34(9.52%)
Lower Urinary tract infection	12(3.36%)
Respiratory tract infection	14(3.92%)
Surgical complication	43(12.04%)
Lymphocele	18(5.04%)
Wound infection	17(4.76%)
Urine leak	8(2.24%)
Vascular Complication	9(2.52%)
Deep vein thrombosis	5(1.4%)
Renal vein thrombosis	2(0.56%)
Renal artery occlusion	1(0.28%)
Acute cortical necrosis	1(0.28%)

Table 4: Frequency of BK virus infection in renal allograft recipients (n=29)

	Frequency
Not detected	23(79.3%)
Detected	6(20.7%)
BK virus PCR positive in both urine and blood	1(3.4%)
BK virus PCR positive in urine only	5(17.3%)
BK virus PCR positive in blood only	0(0.0%)

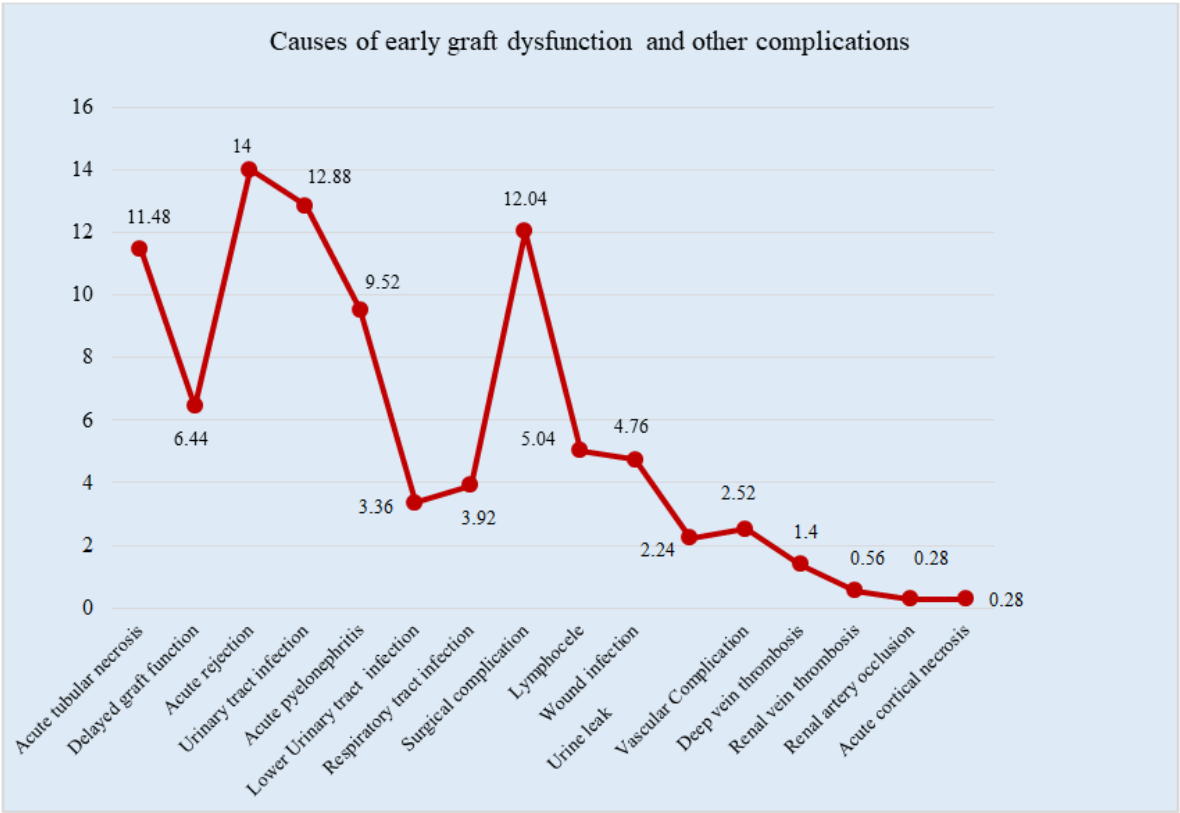

Figure III: Column chart showed Causes of early graft dysfunction and other complications (N=360)

Table 5: Long term complications (n=301)

New onset diabetes after transplantation(NODAT)	36(11.88%)
Vericella infection	34(11.22%)
Post-transplant errythrocytosis	21(6.93%)
Tuberculosis	15(4.95%)
Post-transplant leucopenia	14(4.62%)
Cytomegalo virus infection	10(3.3%)
Recurrent urinary tract infection	6(1.98%)
Post-transplant malignancy	3(0.99%)
Pancreatitis	2(0.66%)

Table 6: Causes of chronic allograft dysfunction (n=301)

Causes	**Frequency**
Chronic allograft nephropathy (CAN)	60(19.80%)
Chronic calcinurine inhibitor toxicity	37(12.21%)
Denovo-glomerulonephritis	23(7.59%)
Recurrent glomerulonephritis	22(7.26%)
Unknown cause	15(4.95%)
Recurrent UTI	12(3.96%)
Obstructive uropathy	6(1.98%)

Table 7: Comparison of graft survival in LRRT in Different studies (N=360)

Years	**BSMMU**	**BIRDEM [18]**	**SIUT, Pakistan [19]**	**Govt. General Hosp, India [20]**	**Namazi hospital, Iran [21]**	**USA [22]**	**School of medicine of Botucatu, Brazil [23]**
1 Year	93.88%	94.1%	92%	92%	98.3%	96.3%	97.6%
3 Years	86.24%	85.9%		82%	96.4%	89.6%	
5 Years	75.16%	77.3%	81.4%	75%	92.5%	81.4%	88.6%

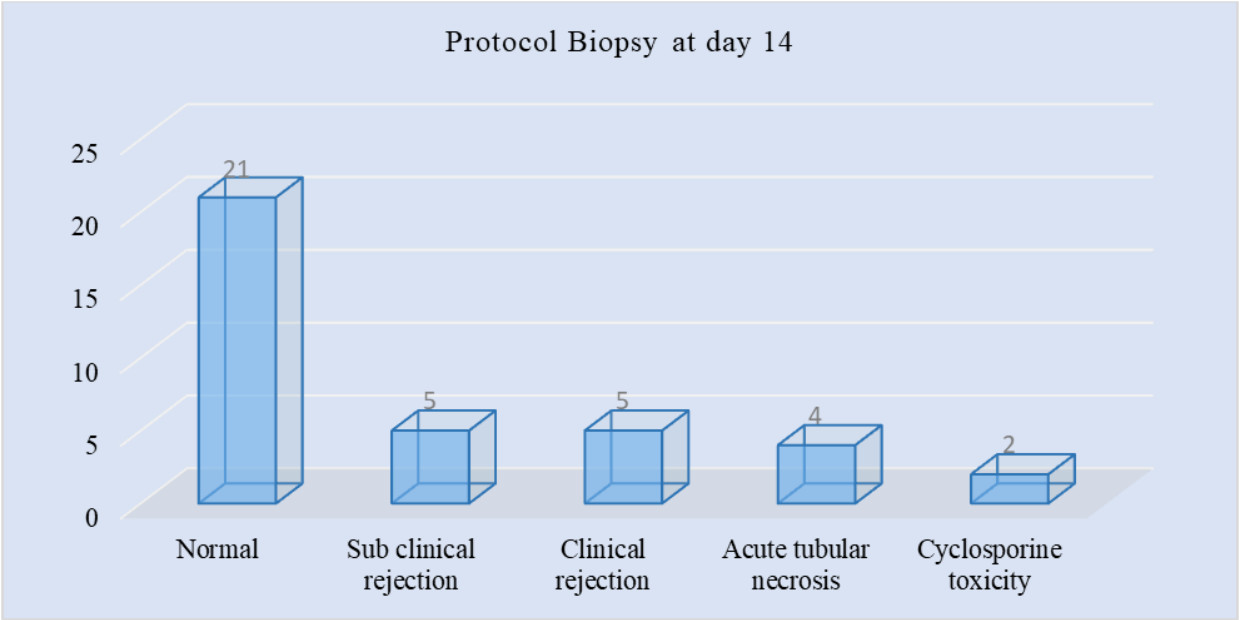

Figure IV: Column chart showed Causes of early graft dysfunction and other complications (n=37)

DISCUSSION

Now a day the outcome of live related kidney transplant recipients has markedly improved a lot because of the following reasons- Recipients and donor selection criteria has improved remarkably, use of less toxic and more efficient immunosuppressive drugs, use of induction therapy and lastly strategy used to combat infection and post-transplant complications of recipients [7-9]. BSMMU is one of the largest transplant center in Bangladesh where 360 live related renal transplant has been done in last 14 years. Among the recipients, most (61.60%) were male whereas majority of the donors were female (76.72%). In United States most (60%) of the live related donor population has been female [10]. Worldwide same pattern is seen with more male predominant recipients undergoing live related kidney transplantation [11]. Most (79%) of the donors were genetically related and only 21% were genetically unrelated where all of them were spouse. In our transplant act live unrelated renal transplant is prohibited but it is not discouraged in most of the other part of the world as five year's graft survival is very much satisfactory [12]. With introduction of calcinurin inhibitor (Cyclosporine/Tacrolimus) and mycophenolate mofetil there is significant reduction of incidence of acute rejection [13]. More over induction therapy with Basiliximab has a role in long term graft survival with the use of less toxic but more effective immunosuppressive medications [13]. Addressing co-morbidity and prompt detection of post-transplant infection with other complication guided us to manage them properly by which both patient and graft survival was greatly influenced. All this thing is reflected in the result of our present study. Overall state of immunosuppression by ESRD itself and immunosuppressive medications renders the transplant recipients very much prone to infection [14]. In our study we observed early fatal complication in 14(3.92%) patients most of them were due to infection in different sites of the body. In early post-transplant period beside acute rejection and ATN, infection was the major cause of morbidity in our study. UTI was the commonest infection which we faced in 46(12.88%) cases out of them 34(9.52 %) recipients developed acute pyelonephritis. This high rate of urinary tract infection may be related to placement of DJ stent in each cases and late removal of Foleys catheter usually after 7-10 days which has been also mentioned as Post-transplant risk factor for UTI in other study [15]. Post-transplant Tuberculosis was found in 15(4.95%) of our cases and most of them were detected within one year of transplantation. In a prospective analysis of 266 transplant recipients in a center of India showed 17% had TB [16]. Lower incidence TB in our study may be due to meticulous work up for TB before transplant and using prophylaxis in suspected cases and also we do not perform transplant in HBV and HCV infected patients. Varicella affected recipients were 34(11.22%) which was most common acute viral complication after Transplant and all occurred in first three months of transplantation. All patient responded to oral acyclovir therapy as reported by other authors [17]. In our study 1 year and 5 year's graft survival was 93.88% and 75.16% respectively. This is similar to other Transplant center in our country [18]. This finding is also similar to other transplant centers in this subcontinent and some developed countries of the world [19-23]. Regarding

patient survival 1 year and 5 year's patient's survival was 346(96.08%) and 290(81.2%). This report is the summery of our recipient and donor profile, post-transplant immunosuppression protocol and difficulties and complications which we faced during the course of our management. Our result showed that live related renal transplantation is the better mode of RRT for ESKD patients with improved quality of life.

REFERENCES

1. Hill, N. R., Fatoba, S. T., Oke, J. L., Hirst, J. A., O'Callaghan, C. A., Lasserson, D. S., & Hobbs, F. R. (2016). Global prevalence of chronic kidney disease–a systematic review and meta-analysis. *PloS one*, *11*(7), e0158765. https://doi.org/10.1371/ journal. pone. 0158765.PMid:27383068 PMCid:PM C4934905
2. Albright, A., Burrows, N. R., Jordan, R., & Williams, D. E. (2009). The kidney disease initiative and the division of diabetes translation at the centers for disease control and prevention. *American journal of kidney diseases*, *53*(3), S121-S125. https:// doi.org/10.1053/j.ajkd.2008.06.037.PMid:1923 1756
3. National Kidney Foundation. Milestone in Organ Transplantation. Available form: https://www.kidney.org/ transplantation/transaction/Milestones-Organ-Transplantation (assessed November 1, 2017).
4. Rizvi, S. A. H., Naqvi, S. A. A., Zafar, M. N., & Akhtar, S. F. (2013). A kidney transplantation model in a low-resource country: an experience from Pakistan. *Kidney international supplements*, *3*(2), 236-240.
5. Foster III, C. E., Philosophe, B., Schweitzer, E. J., Colonna, J. O., Farney, A. C., Jarrell, B., ... & Bartlett, S. T. (2002). A decade of experience with renal transplantation in African-Americans. *Annals of surgery*, *236*(6), 794-805.
6. D'Alessandro, A. M., Sollinger, H. W., Knechtle, S. J., Kalayoglu, M., Kisken, W. A., Uehling, D. T., ... & Pirsch, J. D. (1995). Living related and unrelated donors for kidney transplantation. A 28-year experience. *Annals of surgery*, *222*(3), 353-64
7. Andrade, L. G. M. D., Garcia, P. D., Contti, M. M., Silva, A. L. D., Banin, V. B., Duarte, J. D. C., & Carvalho, M. F. C. D. (2014). The 600 kidney transplants performed at the Botucatu Medical School Hospital-UNESP: Changes over. *Brazilian Journal of Nephrology*, *36*, 194-200.
8. Abraham, G., John, G. T., Sunil, S., Fernando, E. M., & Reddy, Y. N. (2010). Evolution of renal transplantation in India over the last four decades. *NDT plus*, *3*(2), 203-207.
9. Matas, A. J., Payne, W. D., Sutherland, D. E., Humar, A., Gruessner, R. W., Kandaswamy, R., ... & Najarian, J. S. (2001). 2,500 living donor kidney transplants: a single-center experience. *Annals of surgery*, *234*(2), 149-64.
10. Albright, A., Burrows, N. R., Jordan, R., & Williams, D. E. (2009). The kidney disease initiative and the division of diabetes translation at the centers for disease control and prevention. *American journal of kidney diseases*, *53*(3), S121-S125. https:// doi.org/10.1053/j.ajkd.2008.06.037.PMid:1923 1756
11. Hill, N. R., Fatoba, S. T., Oke, J. L., Hirst, J. A., O'Callaghan, C. A., Lasserson, D. S., & Hobbs, F. R. (2016). Global prevalence of chronic kidney disease–a systematic review and meta-analysis. *PloS one*, *11*(7), e0158765. https://doi.org/10.1371/ journal.pone.0158765.PMid:27383068 PMCid:PM C4934905
12. McEwan, P., Baboolal, K., Dixon, S., Conway, P., & Currie, C. J. (2005). Patterns of graft and patient survival following renal transplantation and evaluation of serum creatinine as a predictor of survival: a review of data collected from one clinical centre over 34 years. *Current medical research and opinion*, *21*(11), 1793-1800. https://doi.org/10.1185/ 030079905X65574.PMid:16307700
13. D'Alessandro, A. M., Sollinger, H. W., Knechtle, S. J., Kalayoglu, M., Kisken, W. A., Uehling, D. T., ... & Pirsch, J. D. (1995). Living related and unrelated donors for kidney transplantation. A 28-year experience. *Annals of surgery*, *222*(3), 353-64 https://doi.org/10.1097/00000658-199509000- 00012 PMid:7677464 PMCid: PMC1234817
14. Abraham, G., John, G. T., Sunil, S., Fernando, E. M., & Reddy, Y. N. (2010). Evolution of renal transplantation in India over the last four decades. *NDT plus*, *3*(2), 203-207. https://doi.org/10.1093/ndtplus/sfp178
15. Kamath, N. S., John, G. T., Neelakantan, N., Kirubakaran, M. G., & Jacob, C. K. (2004). Bacterial infections after renal transplantation. *Indian J Nephrol, 14,* 146.
16. Chelluri, L. K., Vasantha, A., & Ratnakar, K. S. (2009). Impact of ethnicity, donor status and HLA matching on renal allograft survival: a single center study. *Saudi journal of kidney diseases and transplantation*, *20*(6), 995-997.
17. Pandya, A., Wasfy, S., Hebert, D., & Allen, U. D. (2001). Varicella-zoster infection in pediatric solid-organ transplant recipients: A hospital-based study in the prevaricella vaccine era. *Pediatric transplantation*, *5*(3), 153-159.
18. Mitra, P., Hossain, M. G., Hossan, M. E., Khoda, M. M. E., Rahim, M. A., Hossain, M. J., ... & Mansur, M. A. (2018). A decade of live related donor kidney

transplant: experience in a tertiary care hospital of Bangladesh. *BIRDEM Medical Journal*, *8*(3), 198-202.

19. Rizvi, S. A. H., Naqvi, S. A. A., Zafar, M. N., & Akhtar, S. F. (2013). A kidney transplantation model in a low-resource country: an experience from Pakistan. *Kidney international supplements*, *3*(2), 236-240.
20. Abraham, G., John, G. T., Sunil, S., Fernando, E. M., & Reddy, Y. N. (2010). Evolution of renal transplantation in India over the last four decades. *NDT plus*, *3*(2), 203-207.
21. Almasi-Hashiani, A., Rajaeefard, A. R., Hassanzade, J., Salahi, H., Nikeghbalian, S., Janghorban, P., & Malek-Hosseini, S. A. (2011). Graft survival rate of renal transplantation: a single center experience,(1999-2009). *Iranian Red Crescent Medical Journal*, *13*(6), 392-7.
22. OPTN/SRTR 2009 Annual Report.
23. Andrade, L. G. M. D., Garcia, P. D., Contti, M. M., Silva, A. L. D., Banin, V. B., Duarte, J. D. C., & Carvalho, M. F. C. D. (2014). The 600 kidney transplants performed at the Botucatu Medical School Hospital-UNESP: Changes over. *Brazilian Journal of Nephrology*, *36*, 194-200.