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Role of Hla-A and Hla-B Antigen Matching in Renal Aloograft Survival

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Abstract **Original Research Article**

Introduction*:** Role of matching of HLA- antigen in the outcome of Kidney transplantation is a well-established fact. But properly matched donor selection is a difficult job. In order to observe the role of HLA-antigen matching in renal transplantation, this study was done in Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Materials and methods: One hundred live related Kidney transplant cases were included in this study. All cases were divided into two groups, Group 1 (n=74) having much better HLA matched than Group 2(n=26) ($p<0.001$). The cases were ovserved retrospectively for one year from the data of transplantation. ***Results: After one year, level of serum creatinine was significantly higher in Group 2 in comparison to Group 1 (147.29 ± 33 µmol/lit vs 273.07±50 µmol/lit, $p < 0.05$). Rate of Acute rejection was higher in group 2, than Group 1(22.97% vs 57.70%, $p < 0.001$). Graft survival was significantly better in Group 1 than in Group 2 (90.54% bs 65.88%, $p < 0.05$). ***Conclusion:*** Kidney transplantation should be done with good HLA matching between donor and recipient. As poor HLA matching is found to have poor outcome and better HLA matching in live kidney transplantation is found to have better graft outcome.

Keywords: Hla-A Hla-B Renal Aloograft Survival.

INTRODUCTION

Renal transplantation is the treatment of choice for patients with ESRD. Since the first report on renal transplantation in 1955, there has been continuous effort to improve the survival of renal transplantation[1]. Live related transplantation is the method of choice for patients with ESRD in our country. Renal transplantation had been started in Dhaka, Bangladesh since 1982[2]. Graft survival is influenced by HLA matching as seen by many study. In one study done in Bangladesh showed that the graft survival where 96% in the 1st year and 81% in the 3rd year. Graft survival were significantly better in live related transplantation (LRT) group than LURT ($p<0.05$) at 1 year but not at 3 years. 3 In order to find out the role of HLA-antigen matching in Kidney transplantation, this study was done in BSMMU among Live related Kidney recipients.

MATERIALS AND METHOD

100 patients suffering from End Stage Kidney Disease (ESKD) who underwent Kidney trnsplantation and the respective 100 Kidney donors were included in this study.

Type of study: Retrospective study.

Place of study: Department of Nephrology. Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka.

Inclusion Criteria

1. Patients of ESKD who underwent Kidney transplantation in BSMMU.
2. Those Kidney recipient and corresponding donor whose baseline datas were available.
3. Reports of HLA status of both recipients and Donor is available.
4. Kidney recipients who regularly came in follow-up after transplantation.

Exclusion Criteria

1. If kidney transplantation was not done in BSMMU i.e. done in other centre in Bangladesh or abroad.
2. If baseline data and or HLA-report of recipient and or Donor is not available.
3. Kidney recipient who did not come regularly in follow-up after transplantation.

After initial selection the cases were divided into two groups, depending on degree of HLA-A and HLA-B locus matching. Group 1 (n = 74) having 1.87 ± 0.42 locus matching and Group 2 (n=26) having 1.03 ± 0.2 locus matching. Grooup 1 (n = 74) has much better HLA locus mathing than Group 2 (n = 24) ($p < 0.001$) (Table 1). Both the Groups were identical in respect to Age, sex, blood pressure, blood group, hemoglobin level, Relation with donors, duration of dialysis, ischaemia time, recipient's disease (Table 2). All the cases were treated by 'Triple Regime' included Cyclosparine, azathioprine and prednisolone. All the patients were followed up for one year after the day of transplantation.

Table-1: Grouping of patients on HLA-A and HLA-B matching into Group 1 and Group 2

3Parameter	Group 1 (n=74)	Group 2 (n=26)	't' value	P-value
Number of HLA-A and HLA-B locus matching	Good matching 1.87±0.42	Poor matching 1.03±0.2	5.0	p<0.001

Table-2: Showing characteristics of recipients in Group 1 and Group 2

Variable	Group I (n=74)	Group II (n=26)	P-value
RECIPIENT			
1. Age (Years) (Mean±SD)	29.32±9.49	29.11±7.02	NS
2. Sex (Male/Female) (%)	56/18(75.68%/24.32%)	16/10(61.24%/38.41%)	NS
3. Hb- Level (gm/dI±SD)	8.12±0.2	8.0±0.18	NS
4. Blood pressure (mmtto) (Mean±SD) Systolic BP Diastolic BP	142.35±10.37 88.00±12.56	142.94±6.61 86.25±6.93	NS NS
5. Duration of Dialysis Hemodialysis (Months) peritoneal dialysis (Seasion)	4.56±2.31 4.58±3.25	7.11±4.59 5.34±6.08	NS NS
6. Ischaemia Time : (minute) Warm ischaemia Time: Cold Ischaemin Time :	2.05 42.01	2.41 44.15	NS NS
7. Recipient's disease: Chronic Glomerulune phritis Diabetic Nephropathy others.	64(86.49%) 4(5.40%) 6(8.10%)	24(92.31%) 2(7.69%) 0	NS NS

STATISTICAL ANALYSIS

Values are expressed as Mean ± Standard deviation (SD) or Mean ± Standard error (SE) unless otherwise stated. Statistical significance of differences between groups were determined by Paired Student's't' test and correlation coefficient (r) test and Z-test were done where necessary. Statistical significance was accepted as for $p < 0.05$.

RESULTS

At the end of one year, serum creatinine level in Group 1 and Group 2 was 147.29 ± 33 µmol/lit and 273.07 ± 50 µmol/lit respectively. The level of serum creatinine was significantly higher in Group 2 in comparison to Group 1 ($p < 0.05$). Occurrence of acute rejection in Group 1 and Group 2 was 17 (22.97%) and 15 (57.70%) respectively. The acute rejection is significantly higher in Group 2 ($p < 0.001$) (Fig 1). Graft survival at 1 year is 67 (90.54%) in Group 1 and 17(65.88%) in Group 2. Graft survival is statistically more favorable in Group 1 than Group 2 ($p < 0.05$). (Fig 2).

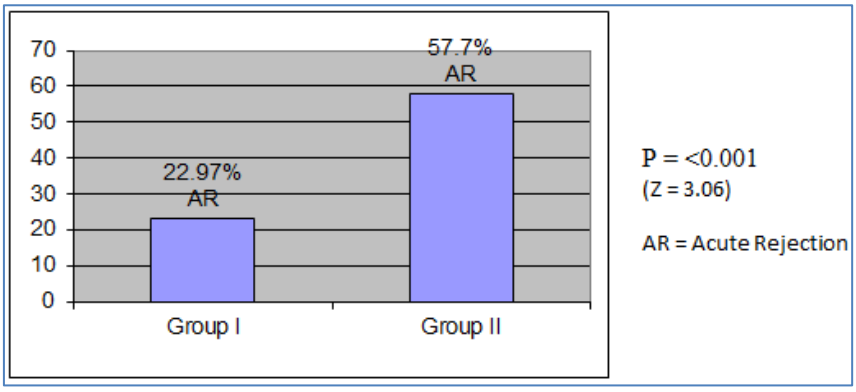

Fig-1: Showing occurrence of acute rejection in Group 1 and Group 2 after one year

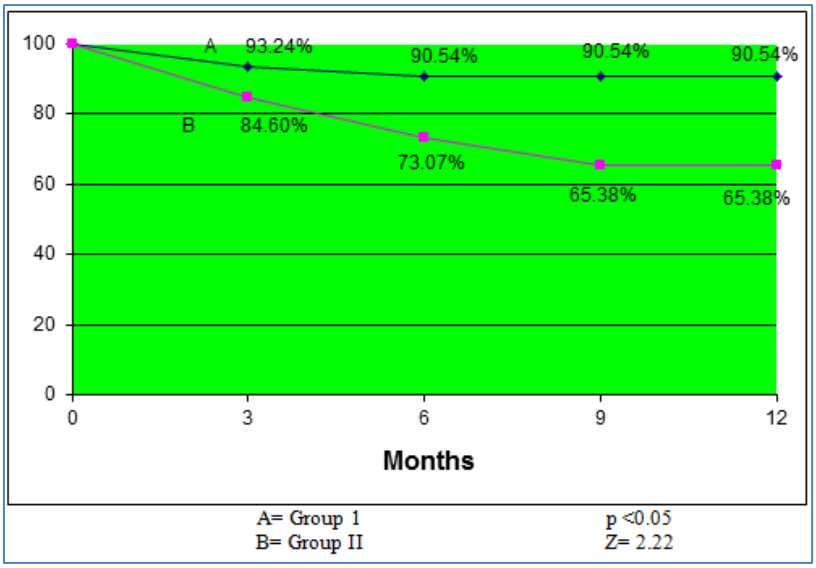

Fig-2: Showing Comparison of 'graft Survival' in Group 1 and Group II

DISCUSSION

Organ transplantation is one of the most important contributions in medicine in turn of this country. At least 50 patients per million populations per year in Bangladesh could be saved by Kidney transplantation alone [4].

Serum creatinine was measured in all the patients at the end of 1 year. In group 1 and Group 2, Serum creatinine was 147.29 ± 23 µmol/lit and 273.07 ± 50 µmol/lit respectively. The level of serum creatinine was significantly higher in Group 2 ($p < 0.05$). This shows that group 2 patients, having poorly matched HLA-A and HLA-B locus, have graft with poor excretory function in comparison to Group 1 at the end of one year.

In our study occurrence of Acute rejection in Group 1 and Group 2 was 17(22.97%) and 15(57.7%) respectively, showing significantly higher value in Group 2 ($p < 0.001$). In one study done in BSMMU, the incidence of acute rejection was 28%[5]. The rate of acute rejection varies from centre to centre. Acute rejection occurs less frequently in cyclosporine treated groups as compared to azathioprine treated froup[6]. In conventional treated HLA identical recipients acute rejection varies between 25-50%[7]. But as all the transplants in our study was done in the same center i.e. BSMMU, so 'center' has no effect in the occurrence of acute rejection. Similarly, there is no influence of various immunosuppressive protocols as all our patients were getting the name immunosuppressive 'Triple Therapy'. So, the only determining factor in the high occurrence of acute rejection in Group 2 (57.70%) is the poor HLA-locus matching in recipients. This proves that poor HLA matching is associated with high occurrence of acute rejection in live related renal transplantation.

Graft survival in our study is 67(90.54%) and 17(65.88%) in Group 1 and Group 2 respectively. Graft survival is statistically more favorable in Group 1 than Group 2 ($p < 0.05$). In previous study done in BSMMU, the 1year graft survival was 96%[5].

Graft survival in out patients is more or less similar to those in others. In Scandinavian multi-centre study, graft survival at 1 year was 91.6%. In one study done in Dusseldorf, Germany [8], graft survival in Live related donor transplantation was 94.8% after a mean follow-up of 15 months. In Pakistan, patients with good HLA-matching had 1year graft survival 93%[9]. One year graft survival following living related donor (LRD) transplantation in various Asian countries was as follows: India 83%[10], Pakistan 90%[11], Sri Lanka71%[12], Saudi Arabia 90%[13], Taiwan 82%[14].

Our result is similar to the above mentioned results from various countries. But the poor graft survival in Group 2 (65.88%) of our patients clearly shows poor HLA-matching is directly associated with poor graft survival.

CONCLUSION

Poor HLA-matching is associated with poor outcome and better HLA-matching in Live related Kidney transplantation is found to have better graft outcome. So, Kidney transplantation should always be done with good HLA-matching between donor and recipient and should be post-poned if there is poor HLA-matching.

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