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STUDY ABOUT THE IMMUNOLOGICAL INVESTIGATIONS DONE BEFORE KIDNEY TRANSPLANT IN BASRAH DURING (2012-2017)

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Abstract

Kidney transplant considered as alternative treatment in end-stage renal disease. Human leukocyte antigens an important role in graft rejection, donor specific HLA antibodies that measured by panel reactive antibody, lead to increased sensitization. Cytomegalovirus, Epstein-Barr virus, Hepatitis-B, and -C viruses have an association with poor outcome of the transplant.

The study is aimed to discuss the immunological investigations that were done before the transplant.

The study has carried out in College of Medicine by analyzing the data records for 36 patients undergo kidney transplant in Al-Sadder Teaching Hospital, 5 patients were excluded because of incomplete data. Data has been recorded during (2012-2017). HLA (Human Leukocyte Antigens) matching between recipients and donors including HLA-A, -B, -DR and -DRB1. Presence of PRAs (Panel Reactive Antibodies), Hepatitis B virus surface antigen (HBV sAg), Hepatitis C virus antibody (HCV Ab), Cytomegalovirus (CMV) IgM and IgG, Epstein-Barr virus (EBV) IgM and IgG screened in recipients. Out of 31 recipients, 83.9% were males and 16.1% were females. 77.4% of donors and recipients were relatives and 22.6% were not relatives. 22.6% of donors and 25.8% of recipients were tested for HLA and only 57.14% showed partially matching within some HLA classes. 9.7% of recipients have PRA. No recipient showed positive results for the presence of HBV sAg and HCV Ab. 6.5% of recipients have CMV IgM, 67.7% have CMV IgG, 9.7% showed positive results for the presence of EBV IgM and 6.5% have EBV IgG.

Inconclusion, recipients and donors showed partially matched HLA classes, not all recipients and donors tested for HLA matching. Some recipients have PRA, high percentage of recipients has CMV IgG, and some of them have CMV IgM antibodies. All these factors might effects on the fate of transplant. HLA-DQ have to be tested and screening for the presence of PRA, viral Ag or Abs specific to these viruses in both recipients and donors is recommended.

Keywords: Kidney Transplant, HLA, PRA, Luminex.

Introduction

Kidney transplant is organ transplant into end-stage renal disease that either genetically related or non-related. The first kidney transplant had done in 1952 [1], followed in 1954 by transplant between identical twins [2]. Matching the human leukocyte antigens (HLA) might affect the renal transplant outcomes and mismatches at HLA loci considered as a risk factor [3], development of acute rejection and long-term outcomes [4,5]. Receiving transplant without compatibility testing had survival rate in comparison with one who have no chance for transplantation operation and waiting for deceased donors [6]. High panel reactive antibody (PRA) indicated that the individual is primed to react immunologically against a large proportion of the population. In acute rejection of allogeneic allografts, T lymphocytes being activated in recipient [7]. Immunosuppressive drugs that used to prevent graft rejection, cause depression in immune system of recipient leading to increased susceptibility to pathogens. Cytomegalovirus (CMV) is the most common virus during the first six months after transplantation [8]. Hepatitis B virus (HBV), Investigations for Hepatitis C virus (HCV) and Epstein-Barr virus (EBV) is very important before transplantation.

Aim of study

To study the immunological investigations that were done before the transplant.

Patients & Methods

The study have carried out in University of Basrah / College of Medicine by analyzing the data records for 36 patients undergo kidney transplant in the Transplantation Unit in Al-Sadder Teaching Hospital in Basrah, the mean age group was 26 years. These data recorded during the years (2012-2017). It concerned about HLA matching between recipients and donors including HLA-A, HLA-B, HLA-DR and HLA-DRB1. In addition, screening for presence of Panel Reactive Antibodies (PRAs) in recipients had done. Screening for Hepatitis B virus surface antigen (HBV sAg), Hepatitis C virus antibody (HCV Ab), Cytomegalovirus IgM (CMV IgM), CMV IgG, Epstein-Barr virus IgM (EBV IgM) and EBV IgG by ELISA specific kits. HLA typing had done using IMMUCOR GAMMA Luminex instrument. Protocol used for detection of PRA in recipients had been done by using multiplex bead. Patient's serum incubated in special wells, beads labeled with fluorescence detected by the device. Then by using specific multiplex bead flow index (MFI) equation for titration of antibodies for compatibility detection. Titer less than 2000 considered negative for that antibody while titer more than 2000 considered positive. Recipient sera that indicated antibody titer more than 2000 for specific donor HLA antigen, recommend changing the donor.

Results

Out of 36 patients underwent kidney transplant operation, 5 patients were excluded because of insufficient information. Only 31 patients with their donors included in the present study. Results indicated that out of 31 recipients, 26 (83.9%) were males and 5 (16.1%) were females (Figure1).

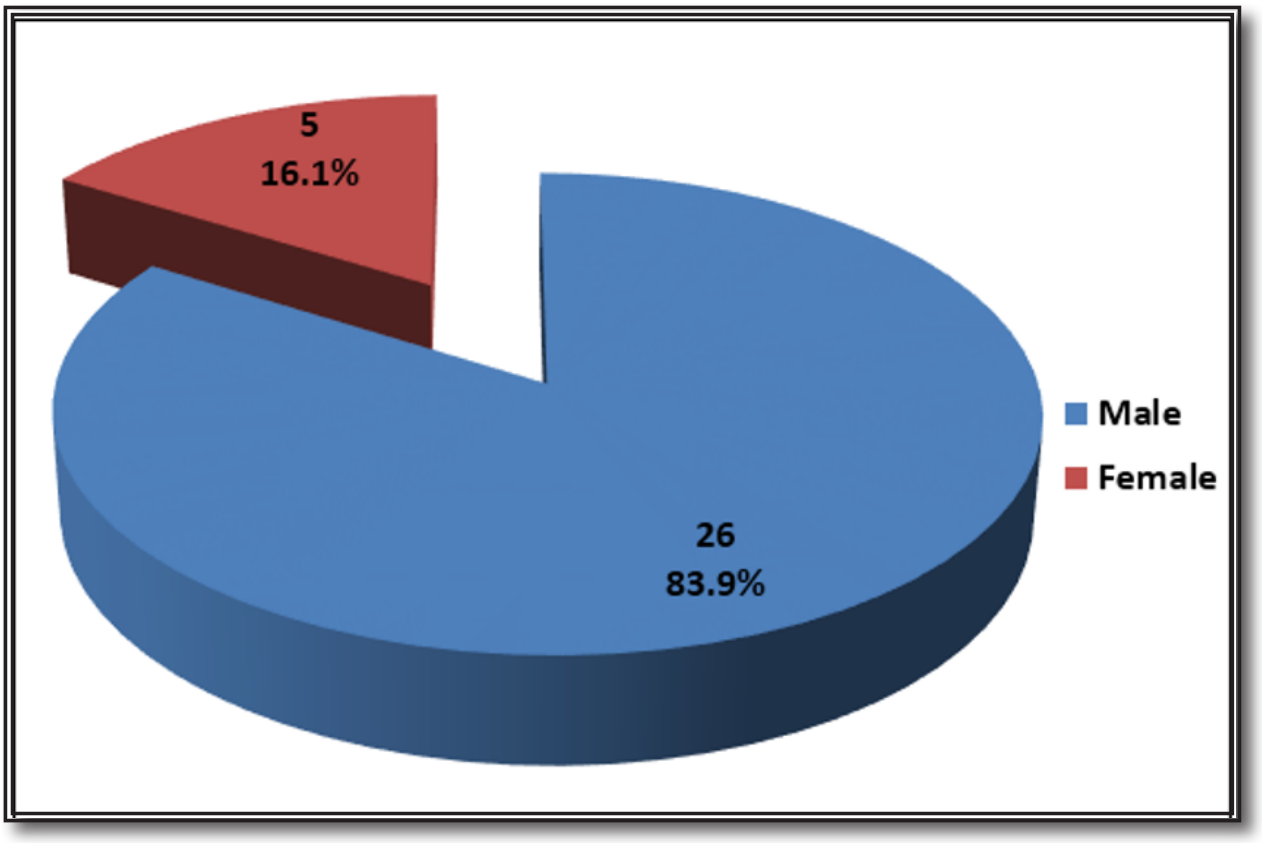

Figure (1) Distribution of recipients according to gender

Distribution of recipients according to age groups showed that 23 (74.2%) were within (> 25) age group and 8 (25.8%) were within (≤ 25) age group (Figure2).

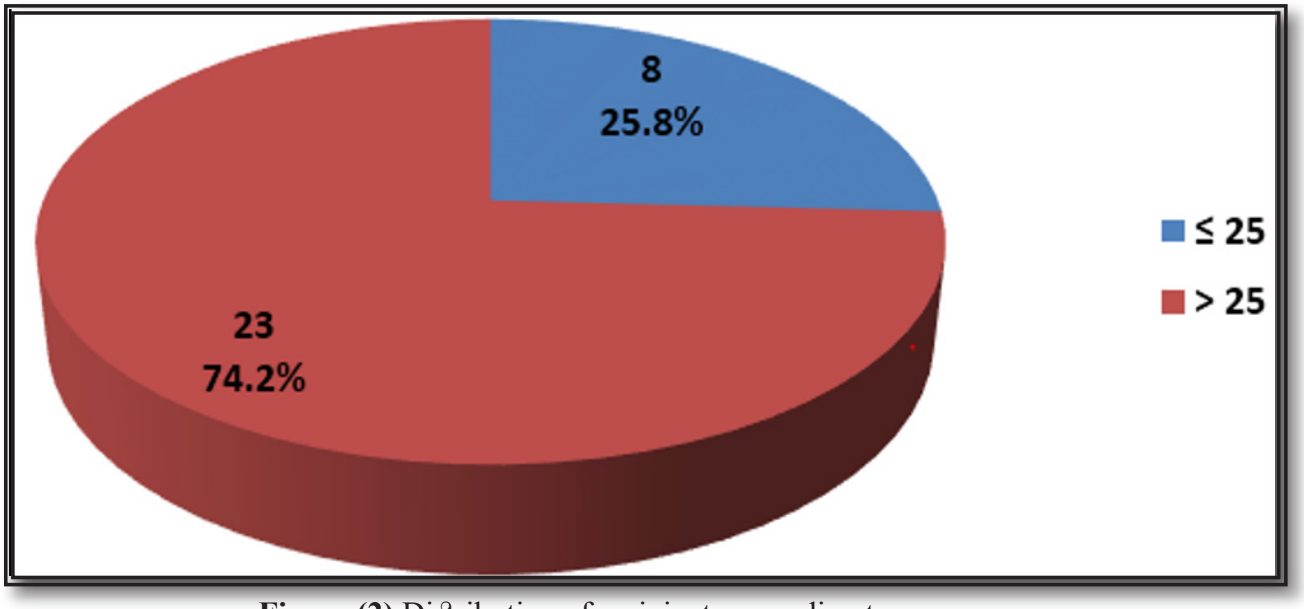

Figure (2) Distribution of recipients according to age groups

Out of 31 donors & recipients, 24(77.4%) were relatives & 7(22.6%) were not relatives (Figure 3).

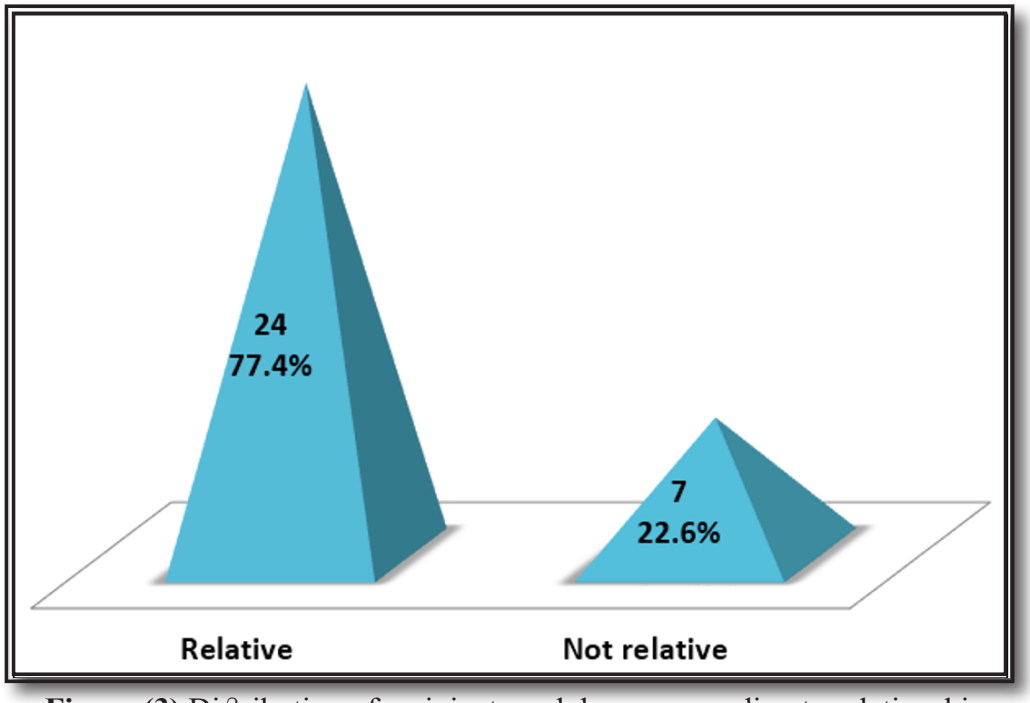

Figure (3) Distribution of recipients and donors according to relationship

Results illustrated in Table (1) indicated that out of 31 donors, 7 (22.6%) were tested for HLA and 24 (77.4%) were not tested. Out of 31 recipients, 8 (25.8%) were tested for HLA and 23 (74.2%) were not tested. HLA matching between donors and recipients indicated that out of 7 donors matched with 7 recipients for HLA compatibility, only 4 (57.14%) showed partially matching within some HLA classes. These classes were (HLA-A 01:02, HLA-B 08:58, HLA-A 03:33, HLA-B 41:58, HLA-A 01:33, HLA-B 05:07, HLA-A 02:03, HLA-DRB1 07:11, HLA-A 01:02, HLA-B 03:07, HLA-A 03:03, HLA-DR 04:07, HLA-A 24:30, HLA-B 14:51. Results in Table (1) indicated that out of 31 recipients, 22 were tested for (PRA) and only 3 (9.7%) showed positive results that indicated the presence of anti-HLA antibodies while 19 (61.3%) showed negative results.

Table (1): Frequency of donors & recipients tested for HLA matching & Panel Reactive Antibody (PRA)

Tests done before kidney transplantation		Number of cases	Percentage of cases
HLA typing for donors	Tested	7	22.6
	Not tested	24	77.4
HLA typing for recipients	Tested	8	25.8
	Not tested	23	74.2
HLA matching	Partially matched	4	57.14
Panel Reactive Antibody (PRA) for recipients	Positive	3	9.7
	Negative	19	61.3
	Not tested	9	29.0

Table (2) indicated the results of tests done for recipients before transplantation to detect viral antigens and antibodies in their serum. Out of 31 recipients, no recipient showed positive results for the presence of Hepatitis B virus surface antigen (HBV sAg) and antibodies specific for Hepatitis C virus (HCV Ab). Also 2 (6.5%) recipients showed positive result for the presence of Cytomegalovirus IgM (CMV IgM) and 21 (67.7%) recipients showed positive results for the presence of Cytomegalovirus IgG (CMV IgG). Testing of recipients for the presence of antibodies specific for Epstein-Barr virus indicated that 3 (9.7%) recipients showed positive results for Epstein-Barr virus IgM (EBV IgM) and 2 (6.5%) showed positive results for Epstein-Barr virus IgG (EBV IgG) (Table 2).

Table (2): Frequency of recipients tested for presence of viral antigens and antibodies

Tests done for presence of viral antigens & antibodies		Number of recipients	Percentage of recipients
Hepatitis B virus surface antigen (HBV sAg)	Positive	0	0
	Negative	31	100
Hepatitis C virus antibody (HCV Ab)	Positive	0	0
	Negative	31	100
Cytomegalovirus IgM (CMV IgM)	Positive	2	6.5
	Negative	29	93.5
Cytomegalovirus IgG (CMV IgG)	Positive	21	67.7
	Negative	10	32.3
Epstein-Barr virus IgM (EBV IgM)	Positive	3	9.7
	Negative	28	90.3
Epstein-Barr virus IgG (EBV IgG)	Positive	2	6.5
	Negative	29	93.5

Discussion

The Kidney transplant graft survival succeeded during recent years, in turn many other failed and return to dialysis [9]. Information collected from the transplantation laboratory data records indicated that frequency of males to females was approximately 5:1. Most of recipients were within age group (> 25). Data showed that not all recipients and donors tested for HLA matching, even those who tested for HLA matching; only 57.14% showed partially matching within some HLA classes. The risk for GVHD have been reported [10]. Also results indicated that 9.7% of recipients showed positive results for PRA testing that indicated the presence of anti-HLA antibodies. HLA matching and other risk factors; PRA, age, body size, and sex play a significant role in graft survival [11]. HLA antibodies are key factors that limit patient access to donor organs. HLA matching appeared to be confined to those with <4 HLA mismatches [12,13]. Results showed that 6.5% of recipients have (CMV IgM) and 67.7% have (CMV IgG). A solid organ recipient might be infected by CMV either by either by the exogenous virus or by reactivation of the latent virus if they were CMV positive pre-transplantation. Those at highest risk of symptomatic CMV disease are CMV seronegative patients who receive organs from CMV seropositive donors, and CMV seropositive patients on heavily immunosuppressive regimens [8]. Only 9.7% of recipients have (EBV IgM) and 6.5% have (EBV IgG). Serological diagnosis of EBV reactivation should be based on strict criteria and on analysis of serial samples [14]. Data of the present study indicated that all recipients showed negative results for the presence of (HBV sAg) and (HCV Ab). Patients with HBV sAb can safely have kidney from donors who are positive for HBV core antibody but negative for HBV DNA [15].

Conclusion and Recommendations

We concluded from the collected data records that most of donors are relatives to the recipients. Although some of them partially matched within some HLA classes, not all recipients and donors tested for HLA matching. Some recipients have PRA, high percentage of recipients has CMV IgG, and some of them have CMV IgM antibodies. All these factors might have effects on the fate of transplant. It is recommended that each recipient and donor should be tested for HLA including HLA-A, HLA-B, HLA-DR and HLA-DQ should be tested, screening for the presence of PRA, viral Ag or Abs specific to these viruses in both recipients and donors is recommended.

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Authership & conflect of interest

This is to verify authership of this article and there is no conflect of interest in any way.

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