The Relationship Between HLA Antigens and Blood Groups

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ABSTRACT

Aim: Recently, organ transplant is the most common treatment of organ deficiency. Although there has been some discussion about the necessity of HLA in recent times, in kidney transplant HLA still keeps on being important. Our aim in this study is to search whether there is a relationship between the HLA antigens and blood type of 362 patients who are registered to the waiting list from cadaver in Selçuk University Transplant Unit.

Method: In this study, the tissue groups of the patients in the waiting list from-cadaver have been determined with Class I microlenfocitotoxicity technique (HLA-A/B/C), Class II (HLA-DR) PCR-SSP (Polymerase Chain Reaction-Single Strand Polymorphism) technique and their blood type with micro plate agglutination.

Result: Of 362 patients on the waiting-list, 206 were male (57%) and 156 female (43%). When the patients were observed according to their blood type, 165 (45%) were A type, 118 (33%) O type, 54 (15%) B type, and 25 (7%) AB type. The most common tissue groups in all blood types, has been detected as in HLA group HLA A2 antigens (48%), in HLA-B group HLA B35 (33%), in HLA-DR group DRB11 antigens (48%). When the commonly seen HLA groups and their blood types were compared, there was found no statistical correlation (p> 0.01).

Conclusion: In this study which we searched about the correlation between HLA antigens and blood types, there could not found any correlation as statistically.

Key words: HLA, blood group, antigen

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HLA-A, B ve Dr Antijenleri ile Kan Gruplarının İlişkisi

Amaç: *Son dönem organ yetmezliğinin en önemli tedavisi organ naklidir. Son yıllarda HLA uyumunun gerekliliği ile ilgili bazı tartışmalar olmasına rağmen böbrek naklinde HLA uyumu hala önemini korumaktadır. Bu çalışmadaki amacımız, Selçuk Üniversitesi Böbrek Nakli Ünitesi kadavradan organ bekleme listesine kayıtlı toplam 362 hastanın HLA antijenleri ile kan grupları arasında bir ilişki olup olmadığını araştırmaktır.*
Metod: *Bu çalışmada Selçuk Üniversitesi Böbrek Nakli Ünitesi kadavradan organ bekleme listesindeki hastaların doku grupları Klas I (HLA-A/B/C) mikrolenfositotoksisite tekniğiyle, Klas II (HLA-DR) PCR-SSP (Polymerase Chain Reaction-Single Strand Polymorphism) tekniği ile belirlenmiş, kan grupları ise microplate aglutinasyon tekniği ile belirlenmiştir.*
Bulgular: *Organ bekleme listesine kayıtlı toplam 362 hastanın 206'sı erkek(%57) 156'sı kadın (%43) idi. Hastalar kan gruplarına göre incelendiğinde 165'i (%45) A kan grubu, 118'i O grubu (%33), 54'ü B grubu(%15), 25'i AB grubu(%7) idi. Tüm kan gruplarında en fazla görülen doku grupları HLA- A grubunda HLA A2 antijenleri (%48), HLA- B grubunda HLA B35 antijenleri (%33), HLA- DR grubunda ise DRB11 antijenleri (%48) olarak tesbit edilmiştir. Sık görülen HLA grupları ile hastaların kan grupları karşılaştırıldıklarında istatistiksel olarak anlamlı bir ilişki tespit edilmemiştir (p> 0.01).*
Sonuç: *Bu çalışmada kan grupları ve HLA antigenleri arasında bir ilişki olup olmadığı arştırıldı, istatistiksel olarak herhangi bir ilişki tespit edilmedi.*
Anahtar kelimeler: *HLA, kan grubu, antijen*

INTRODUCTION

The main duty of the immune system is to realize the unfamiliar molecules and micro organism while defending the body and to respond with various effectors mechanism. In immune realization, the duty of distinguishing unknown antigens from self antigens is performed with basic HLA (Human Leukocyte Antigen) molecules (1). These molecules on the surface of cells bind alien antigens and play key role in starting the immune response by bringing in to the effectors cells. Since they are overly immunogenic, in transplantation, the different molecules between receiver and transmitter are coded as alien antigens and start the rejection mechanism by alerting immune response. Therefore, they are known as HLA transplantation antigens (2). In transplantation, the main purpose of tissue typing is to determine compliance between donor and receiver, and to detect antibodies which can be interacting with donor's tissue antigens in receiver's serum (3). In recent years, the development in molecular biology also rebound to the HLA typing techniques; especially with PCR_SSR (polymerase chain reaction) technique, reliable and certain results have been reached(4).

In Selçuk University Meram Medical Sciences Faculty Tissue Typing labs which started working in August 2002, HLA typing for Class I (HLA-A/B/C) is done with microlenfocitotokcity and for Class II (HLA-DR) with PCR-SSP (Polymerase Chain Reaction-Single Strand Polymorphism) technique. In this study, our aim is to compare the blood types and HLA antigens of 362 patients who are registered to the waiting list of Selcuk University Meram Medicine Faculty and to determine which antigens appear more commonly in which blood types.

MATERIALS AND METHODS

362 patients who are registered to the organ waiting-list of Selcuk University Meram Medication Faculty were investigated retrospectively 206 male, 156, female. The average age of the patients was 45, 5 (5-79). The average age of male patients was 44, 1 (5-73) and the average age for female patients was 47, 3 (14-79). HLA groups of the patients for Class I (HLA-A/B/C) were determined with microlenfocitotokcity technique while for Class II (HLA-DR) it was determined with PCR-SSP (Polymerase Chain Reaction-Single Strand Polymorphism) technique. For detecting the blood types, micro plate agglutination technique was used and most common antigens were detected. The blood type of these patients and HLA antigens were compared via Pearson Chi Square technique.

RESULTS

When the HLA groups were examined, the most common antigens were detected as below:
1) In HLA- A group: A2, A24, A3, A1, A26, A11, A23,
2) In HLA- B group: B35, B51, B44, B18, B38, B27, B13
3) In HLA- DR group: DRB11, DRB4, DRB13, DRB3, DRB15, DRB7

Upon examining the blood types of the patients, we detected that 165 (45%) were A type, 118 (33%) O type, 54 (15%) B type, and 25 (7%) AB type. Between the most common HLA-A, HLA-B, HLA-DRB antigens and blood types, there could not detected any statistical correlation (p>0.01). In all the blood types, the most common antigens in HLA-A group HLA A2 (48%), in HLA-B group HLAB35 (33%), in HLA-DR group DRB11 (48%) were de-

Table 1. *The most common antigens in HLA- A and blood groups*

HLA-A	Patinent	Group 0	Group A	Group B	Group AB
A2	174	54	80	29	11
A24	105	38	51	11	5
A3	83	25	39	15	4
A1	75	26	30	9	10
A26	60	18	28	7	7
A11	50	11	26	9	4
A23	22	5	11	4	2

tected. (Table 1, 2 and 3).

DISCUSSION

The HLA antigens construction in organism is under a gen district which is named as "Major Histo-compatibility Complex Gen Region (MHC). In human beings, it is situated on the short branch of the 6th chromosome and is showed on chromosome map in p21 position. In fatherhood proof, it can be searched with blood type antigens. It can also be used in anthropology. For instance, in USA white population, HLA B27 is found 8%, and USA black population 2% while in African black population HLA B27 is not found at all (5, 6). In our study, the most encountered tissue type for Class I were HLA- A2,A3, A24, A1 , A11 and HLA- B35, B51, B44, B18, B7, for Class II HLA-DR11, DR4, DR3,DR15 and DR1. Both in our study and previous studies, it has been observed that HLA-A2, A9 and HLA-B35, HLA-DR 11 are most common (7-8).

The most important reason to use HLA antigens is to search about tissue compatibility in tissue and organ plantation. As a result of successful operation technique, advanced immunosuppressive treatment methods and progression in intensified care unity, in the recent treatment of kidney insufficiency, kidney transplanta-

tion has been the most ideal way. Since the first successful kidney transplantation was done in 1954, kidney transplantation has been the primary treatment methods for people who have kidney insufficiency (9). Kidney transplantation has provided positive effect on the life of people who have to use dialyze methods chronically. Kidney transplantation has been better for the life of the people to live more comfortably. In recent kidney insufficiency cases, it has been the one that provides the longest and best life quality (10-13).

Since organ donation is so low in our country, transplantations are conducted from live donors. This condition increases the importance of HLA compatibility (14). Tissue group identifying and patient properties will affect the transplantation in a positive way. Organ waiting list is the place where patient waiting for organ and the organ found for him/her meet. When the tissue types of patients properties are not known in waiting list, there may happen mis-transplantation of the forcefully found organ or cause serious problems after transplantation (15).

In this study which we searched about the correlation between HLA antigens and blood types, there could not found any correlation. However, if the most common types of tissue antigens in all blood types are known, it

Table 2. *The Most Common Antigens in HLA- B and blood groups*

HLA-B	Patinent	Group 0	Group A	Group B	Group AB
B35	121	44	49	22	7
B51	113	35	48	24	5
B44	43	17	20	4	2
B18	43	13	23	5	2
B38	41	11	19	5	6
B27	29	13	11	5	0
B13	16	5	11	0	0

Table 3. *The Most Common Antigens in HLA- DRB and blood groups*

HLA- DRB	Patinent	Group 0	Group A	Group B	Group AB
DRB11	174	61	63	31	19
DRB4	102	26	57	14	5
DRB13	78	24	40	11	3
DRB3	73	30	27	9	7
DRB15	61	24	27	7	3
DRB7	51	17	28	5	1

will be possible to look over the patients on the waiting list, detect the proper one and provide time to reach them until the tissue group tests of the cadaver is finished.

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