RESEARCH ARTICLE / Araştırma Makalesi

Screening Test Results of The Donors/ Patients who Applied to Blood Transfusion Center of Sakarya University Training and Research Hospital

Sakarya Üniversitesi Eğitim ve Araştırma Hastanesi Kan Transfüzyon Merkezine Başvuran Donörlerin / Hastaların Tarama Testi Sonuçları

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Abstract

Aim Screening test results of the donors/ patients who applied to Blood Transfusion Center of Sakarya University Training and Research Hospital were retrospectively evaluated. **(Sakarya Med J 2018, 8(3):632-637)**

Methods HBsAg, anti-HCV, and anti-HIV1/2 in blood samples were analyzed using ELISA methods. Syphilis antibodies were evaluated using VDRL test.

Results According to blood bank archives a total of 15665 donors applied for blood donation. During this time period, HBsAg positivity (1.5 %), anti-HCV positivity (0.4 %), VDRL positivity (0.3 %), and anti-HIV 1/2 positivity (0.006 %) were detected in respective percentages of donors. When the results were evaluated according to years of blood donation, we found that the rates of HBsAg positivity, and Anti-HCV positivity decreased significantly within last years, while rates of VDRL, and Anti-HIV positivities did not change significantly.

Conclusion The patients should receive blood transfusions with the lowest risk as much as possible. The most critical step to lower this risk down to zero is to provide safe, and permanent donors.

Keywords Screening test; donor; patient; Blood Transfusion Center

Öz

Amaç Sakarya Üniversitesi Eğitim ve Araştırma Hastanesi Kan Transfüzyon Merkezine başvuran donörlerin / hastaların tarama testi sonuçları retrospektif olarak değerlendirildi. **(Sakarya Tıp Dergisi 2018, 8(3):632-637).**

Yöntem Kan örneklerinde HBsAg, anti-HCV ve anti-HIV1 / 2 ELISA yöntemleri kullanılarak analiz edildi. Sifiliz antikorları VDRL testi kullanılarak değerlendirildi.

Bulgular Kan bankası arşivlerine göre, kan bağışı için toplam 15665 bağışçı başvurdu. Bu süre zarfında, HBsAg pozitifliği (% 1.5), anti-HCV pozitifliği (% 0.4), VDRL pozitifliği (% 0.3) ve anti-HIV 1/2 pozitifliği (% 0.006) olarak tespit edildi. Sonuçlar kan bağışı yıllarına göre değerlendirildiğinde, son yıllarda HBsAg pozitifliği ve Anti-HCV pozitifliğinin anlamlı olarak azaldığı, VDRL ve Anti-HIV pozitiflik oranlarının anlamlı olarak değişmediğini saptadık.

Sonuç Hastalar mümkün olan en düşük riskle kan transfüzyonu almalıdır. Bu riski sıfıra indirmenin en kritik adımı, güvenli ve kalıcı bağışlar sağlamaktır.

Anahtar Kelimeler Tarama testi; donör; hasta; Kan Transfüzyon Merkezi.

Introduction

Treatment with blood and blood products is lifesaving. However, transfusion is also important as it may cause to tranmission of the diseases to recepients. Selection criteria for blood donors, developments in screening tests of donors, use of sensitive, and sophisticated methods for the identification of antigen, antibody, and viral genome, theoretically almost nullified the risk of transfusion related infections. Despite these screening methods, many bacterial and parasitic agents mainly hepatitis B virus (HBV), hepatitis C virus (HCV), ad human immunodeficiency virus can be transmitted through blood transfusion.[1]

Screening for HbsAg (1983), anti-HIV (1987), and anti-HCV in blood centers became legally compulsory in our country. In our country conduction of screening tests for HBsAg, anti-HCV, anti-HIV 1/2, and VDRL or "rapid plasma reagin" in blood centers is obligatory. Even these tests are performed, donors in the window period may constitute a risk. Therefore, for safe blood donation, as a legal obligation, each donor should fill a standardized "Donor Inquiry Form". World Health Organization (WHO) recommendations suggest giving support to volunteered regular blood donors.[2] Procedures performed in blood banks aim to ensure procurement of safe blood, and blood products. The first prerequisite for provision of safe blood is selection of a safe donor.[3] In recent years, increasing number of studies aiming at standardization of donor selection have been performed. Thus, the risk of blood-borne infections is tried to be minimized. Still a screening method that will decrease the transfusion-induced risks down to zero is not available yet, so unnecessary transfusions should be avoided, and donor selection should be made more attentively.

Blood donors should be monitored to determine seropositivities of the society, to monitor transfusion-transmitted diseases, and to decrease this risk. In this study, screening test results of the donors/ patients who applied to Blood Transfusion Center of Sakarya University Training and Research Hospital were retrospectively evaluated.

Materials and Methods

Study design: This is a retrospective chart review study. The approval of Sakarya University Institutional Review Board was provided before the study (050.01.04/55). A total of 15665 donors/ patients who applied to Blood Transfusion Center of Sakarya University Training and Research Hospital between January 2009, and December 2013 were included in this retrospective study. The individuals who had not any chronic disease, and those who did not donate blood within the last two months were accepted as donor candidates. Then, the participants were requested to fill a "Donor Inquiry Form." These forms were evaluated in compliance with Blood and Blood Products Act no 2857 and related legislation provisions, and Turkish Red Crescent donor selection criteria.[3]. Blood was transfused from eligible donors.

Outcome parameters: HBsAg, anti-HCV, and anti-HIV1/2 in blood samples were analyzed using ELISA methods. Syphilis antibodies were evaluated using VDRL test.

Statistical analysis: Data are expressed as N (%), unless otherwise indicated.

Results

Distribution of screening tests performed for blood, and blood products processed in our center

according to years is shown in Table 1. According to blood bank archives a total of 15665 donors applied for blood donation. During this time period, HBsAg positivity (1.5%), anti-HCV positivity (0.4%), VDRL positivity (0.3%), and anti-HIV 1/2 positivity (0.006%) were detected in respective percentages of donors.

Table 1. Donor screening test results.

	Years					Total
	2009	2010	2011	2012	2013	
HBsAg, n (%)	85	94	33	7	18	237 (1.5%)
Anti-HCV, n (%)	17	23	14	1	7	62 (0.4%)
VDRL, n (%)	13	8	5	13	3	42 (0.3%)
Anti-HIV, n (%)	0	1	0	0	0	1 (0.006%)
Total	4193	5917	2517	909	2129	15665

Results of various studies performed in our country are shown in Table 2.[4,5]

Table 2. Prevalence rates of HBsAg, anti-HCV, anti-HIV 1/2, and VDRL among blood donors in our country.

Province	HBsAg (%)	Anti-HCV (%)	Anti-HIV (%)	VDRL (%)
Aydın	1.85	0.16	0	0
Trabzon	3.94	0.74	0	0.47
Mersin	4.1	0.26	0.13	0
Van	2.92	0.22	0.04	0.36
Erzurum	2.6	0.4	0	0
İzmir	2	0.54	0.028	0.007
Diyarbakır	2.75	0.55	0	0.05
Denizli	1.3	0.5	0.023	0.13
İstanbul	2.83	0.04	0.001	0.16
Afyon	1.38	0.35	0.02	0.04
Ankara	1	0.6	0	0
Kastamonu	0.52	0.36	0.1	0.08

When the results were evaluated according to years of blood donation, we found that the rates of HBsAg positivity, and Anti-HCV positivity decreased significantly within last years, while rates of VDRL, and Anti-HIV positivities did not change significantly.

Whole blood, and blood components were transfused from the donors applied between the years 2009, and 2013. Volunteered blood donation, and blood donation from relatives were also recorded.

Discussion

In recent years, blood, and blood products have been used prevalently thanks to developments in many fields of medicine including treatment of blood diseases, hemodialysis, bone marrow, and organ transplantation. Infectious agents appear to lead the way among transfusion-induced deaths. Screening tests for HBsAg, anti-HCV, anti-HIV 1/2, and syphilis were legally obligatory tests, and with these screening tests risk of contamination through transfusion was tried to be eradicated. In all countries, screening tests for HBV, HCV, and HIV, and in many countries also for

syphilis are being performed to diagnose, and treat transfusion-transmitted infections. In our country with regulations, legislations, memoranda, and notifications published related to Blood and Blood Products Act # 2857, as a legally imposed obligation starting in effect from indicated years in parentheses, blood banks must use ELISA test as screening for HIV (1978), and RPR , HbsAg, HIV, and malaria (1992), anti-HCV (1996), and blood banks should have kits of rapid screening tests for only emergency transfusions (1996).[6]

As is the case in other countries, in Turkey, HBV, HCV, and HIV are important infectious agents transmitted with blood, and blood products. Among them HBV leads the way. In Turkey HBsAg positivity rates among blood banks range between 1.1, and 5.98 percent.[7-14] According to "Form 113" data sent from various blood centers to TR Ministry of Health, HbsAg positivity was detected at a rate of 1.4% in Red Crescent Blood centers.15 Based on the same data HbsAg positivity changes between 0.75, and 1.6 % in other health institutes (SSK, universities, other public, and private institutions).[15] In developing countries like ours HbsAg positivity ranges between 0.47, and 2.2 %.[16-19] In our study the rate of HBsAg positivity was detected as 1.5 % which is close to those reported for Western regions of Turkey. Decrease in HbsAg positivity was seen when all data were evaluated. This decrease in rates may be due to more attentive selection of donors, also it may be associated with increase in hepatitis B vaccination rates in recent years.

After performing anti-HCV tests in donors became legally obligatory in Turkey in the year 1996, screening of blood donors for HBsAg, and HCV using sensitive tests significantly decreased transmission of these viruses through blood. In blood banks screening of HCV which is associated with cirrhosis, and hepatocellular carcinoma decreased risk of transfusion - induced HCV infection for each unit of blood transfused from 0.19% down to 0.03 %.9 Anti-HCV rates in studies performed on donated blood samples do not demonstrate great differences among regions in Turkey. In our country, anti-HCV positivity changes between 0.16, and 0.60 %.7-14 According to 1998 TR. Ministry of Health data, anti-HCV was detected at an incidence rate of 0.2 % among 1350018 donors.[15] Incidence of anti-HCV –positivity changes between 0.28, and 3.68% among blood donors abroad.[16-19] In our study anti-HCV positivity was detected in 0.4 % of blood donors which is in accordance with the rates detected in other centers.

Nearly 3-5% of HIV-induced infections are conceivably transmitted through blood transfusion. The predominant risk in transfusion-transmitted HIV infections is blood donated by the donor during early phase of seroconversion. In our country, anti-HIV positivity was found to be 0-0.36 percent.[7,9-13] In some studies, performed among blood donors abroad anti-HIV positivity was reported to vary between 0.03, and 0.56 %.16-19 In our study anti-HIV positivity was detected as at a rate of 0.006 percent.

Screening tests for the pathogenic agent of syphilis also transmitted via blood transfusion have been also performed. Nowadays, this infection is transmitted very rarely through blood transfusion. The incidence of VDRL positivity in blood centers of our country has been detected as 0-0.36 %.[7,10-11] In studies performed among blood donors abroad, RPR positivity ranged between 0.43, and 0.80 percent.[16,17,19] In our study VDRL positivity was detected in 0.3% of donors in parallel with Turkey's average.

In conclusion our patients will always need blood. As an important issue, the patients should receive blood transfusions with the lowest risk as much as possible. The most critical step to lower this risk down to zero is to provide safe, and permanent donors. Serologic screening tests will decrease the risk of infection further.

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