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# Seroprevalence of transfusion transmissible infections among blood donors in western part of Turkey: A six-year study

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ABSTRACT

*Background:* The most frequently encountered complication of blood transfusion is transfusion transmissible infections. Screening of transfusion transmissible infections are for safe blood transfusions, the results provide a crude idea about seropositivity rates of regions.
*Objective:* The present study aimed to investigate distributions of transfusion transmissible infection seroprevalences in years and according to gender through medical records, and to define the regional data, retrospectively.
*Methods:* 80.454 Blood donors, applied to our center between dates August 2004 and December 2010, were investigated by HBsAg, anti-HVC, anti-HIV ELISA (Abbott, AXSYM) and RPR methods.
*Results:* Out of 80.454 donors, 7.321 (9.1%) were females, 73.133 (90.0%) were males. Age range of donors was 18–64 years (mean 41 years). While 61.950 (77%) of donors were voluntary, 18.504 (23%) were familial/replacement donors. 1.405 units of blood out of 80.454 were disposed, because one of infection parameters was positive. 45 units (3.2%) of disposed blood were from females, the rest belonged to male donors (1.360 units; 96.8%). HBsAg was positive in 1.054 donors (1.31%), whereas positivities of anti-HCV, anti-HIV and RPR were 312 (0.38%), 2 (0.002%) and 39 (0.04%), respectively.
*Conclusions:* Seropositivity was determined in accordance with national data, but was at lower limits. Seropositivity rates in years differed, but neither regularly increases nor decrease was observed. When all positivities were investigated according to genders, positivity in HBsAg and VDRL tests were significantly high in male donors.


## 1. Introduction

WHO defines safe blood as "blood that does not cause any danger or disease, and does not contain any infectious agents or harmful foreign bodies" [1]. Although all microorganisms can cause transfusion transmissible diseases, viruses cause most of the problems in practice [2]. Common features of transfusion transmissible viral infections have window period that serological markers are all negative (2). Data about transmission of viral infections date back to 1940s [3].

As a part of national blood banking procedures, hepatitis B surface antigen (HBsAg), anti-HCV, anti-HIV and syphilis (VDRL/RPR) are being checked in all donated blood [4]. In last 10–15 years, elimination practices about transfusion transmitted infectious diseases are carried out in many parts of the world, and screening with sensitive methods is being performed. Despite this, units of transmission for HCV, HBV and HIV by blood and blood products are estimated as 1/100,000, 1/63,000 and 1/680,000 units, respectively [3].

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When infections with microorganisms excluding viruses are compared with viral ones, they are observed less frequent. Therefore, in order to prevent these infections, medical histories and detailed physical examinations of donors are preferred to examination of blood components by microbiologic and serologic methods [5]. However, *Treponema pallidum* is still being screened in many countries including Turkey, since it may be an indicator of donor's life style [1].

In this present study, donor records at our unit are retrospectively examined for agents, with high transmission potentials and severe outcomes, and the results were analyzed. We aim that our results will have a great contribution into regional data, since our hospital is the largest training and research hospital in the Aegean Region.

## 2. Materials and methods

All donor records of Blood Center at Izmir Ataturk Training and Research Hospital between dates August 2004 and December 2010 are examined retrospectively. Donors, who applied to our center, were asked to fill in donor inquiry forms, and then physicians at our center interviewed donors and performed physical examinations. Donation procedures are performed in accordance with blood drawing criteria in "National Blood and Blood Products Guide". People, who had hepatitis, operation in last 1 year, tattoo, acupuncture, piercing, risky sexual intercourse, oral and IV narcotic addiction in their medical histories, are not accepted as donors.

HBsAg, anti-HCV and anti-HIV screening tests were performed by Microparticle-EIA (AxSYM, Abbott USA) method, whereas syphilis screening tests were performed by Rapid Plasma Reagin (RPR) method. Samples with positive test results were re-tested by the same method, the same equipment and the same serum sample for repetitive reactivity. Donated blood, which had positive result in any one of the tests, was disposed according to disposition procedures. Donors were referred to infectious diseases or gastroenterology departments for confirmation tests. In cases of repetitive anti-HIV positivity, serum samples were sent to Refik Saydam Hygiene Center for Western Blot confirmation.

Data were analyzed by SSPS 16.0 for Windows. Groups were compared with Chi square test. $p \leqslant 0.05$ was accepted as the level of significance.

## 3. Results

Out of 80.454 donors, 7.321 (9.1%) were females, 73.133 (90.0%) were males. Age range of donors was 18–64 years (mean 41 years). While 61.950 (77%) of donors were voluntary, 18.504 (23%) were familial/replacement donors. 1.405 units of blood out of 80.454 were disposed, because one of infection parameters was positive. 45 units (3.2%) of disposed blood were from females, the rest belonged to male donors (1.360 units; 96.8%). HBsAg was positive in 1.054 donors (1.31%), whereas positivities of anti-HCV, anti-HIV and RPR were 312 (0.38%), 2 (0.002%) and 39 (0.04%), respectively (Table 1). Seropositivity rates in years differed, but neither increase nor decrease was observed. Seropositivity was determined in accordance with national data, but was at lower limits. Changes of seropositivity in years are shown as a graph (Fig. 1).

**Table 1**
Seropositivity rates of HbsAg, HCV, HIV and RPR according to years and gender.

| Years | Annual Donors | Gender | HbsAg (+) | | HCV (+) | | HIV (+) | | RPR (+) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *n* | % | | % | | % | | % |
| 2004 | 7.733 | Female | 4 | 4.5 | – | 0.0 | – | 0.0 | – | 0.0 |
| | | Male | 86 | 95.5 | 11 | 100.0 | 1 | 100.0 | 1 | 100.0 |
| | | Total | 90 | 1.16 | 11 | 0.14 | 1 | 0.012 | 1 | 0.01 |
| 2005 | 19.512 | Female | 8 | 2.8 | – | 0.0 | – | 0.0 | 2 | 18.2 |
| | | Male | 282 | 97.2 | 72 | 100.0 | 1 | 100.0 | 9 | 81.8 |
| | | Total | 290 | 1.48 | 72 | 0.36 | 1 | 0.005 | 11 | 0.05 |
| 2006 | 12.977 | Female | 10 | 4.7 | – | 0.0 | – | 0.0 | 1 | 10.0 |
| | | Male | 204 | 95.3 | 49 | 100.0 | – | 0.0 | 9 | 90.0 |
| | | Total | 214 | 1.64 | 49 | 0.37 | – | 0.0 | 10 | 0.07 |
| 2007 | 9.233 | Female | 6 | 5.0 | – | 0.0 | – | 0.0 | – | 0.0 |
| | | Male | 115 | 95.0 | 57 | 100.0 | – | 0.0 | 7 | 100.0 |
| | | Total | 121 | 1.31 | 57 | 0.61 | – | 0.0 | 7 | 0.07 |
| 2008 | 9.790 | Female | 9 | 8.7 | – | 0.0 | – | 0.0 | – | 0.0 |
| | | Male | 95 | 91.3 | 47 | 100.0 | – | 0.0 | 4 | 100.0 |
| | | Total | 104 | 1.06 | 47 | 0.48 | – | 0.0 | 4 | 0.04 |
| 2009 | 7.999 | Female | – | 0.0 | – | 0.0 | – | 0.0 | – | 0.0 |
| | | Male | 92 | 1000 | 31 | 100.0 | – | 0.0 | 3 | 100.0 |
| | | Total | 92 | 1.15 | 31 | 0.38 | – | 0.0 | 3 | 0.03 |
| 2010 | 13.072 | Female | 5 | 3.5 | – | 0.0 | – | 0.0 | – | 0.0 |
| | | Male | 138 | 96.5 | 45 | 100.0 | – | 0.0 | 3 | 100.0 |
| | | Total | 143 | 1.09 | 45 | 0.34 | – | 0.0 | 3 | 0.02 |
| Total | 80.454 | Female | 42 | 4.0 | – | 0.0 | – | 0.0 | 3 | 7.7 |
| | | Male | 1.012 | 96.0 | 312 | 100.0 | 2 | 0.0 | 36 | 92.3 |
| | | Total | 1.054 | 1.31 | 312 | 0.38 | 2 | 0.002 | 39 | 0.04 |