

ORIGINAL RESEARCH

Assessment of seroprevalence of transfusion transmitted infections amongst blood donors

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ABSTRACT

Background: Transfusion-related morbidity and mortality are more likely when infectious blood and blood components are used. The present study was conducted to assess seroprevalence of transfusion transmitted infections amongst blood donors. **Materials & Methods:** 265 donors of both genders were included. The screening tests were performed by following the current national guidelines and the manufacturer's instructions. The TTI screening section used the electrochemiluminescence immunoassay to screen for HBsAg, anti-HCV, HIV, and anti-TP. The screening for malarial parasite was performed by enzyme-linked immunosorbent assay. **Results:** Out of 265 patients, males were 155 and females were 110. Type of donation was voluntarily in 92 and replacement in 173. The difference was significant ($P < 0.05$). Transfusion transmitted infections prevalence in voluntarily donor for HBV, HCV, HIV, Malaria and syphilis was 1.5%, 1.2%, 0.8%, 0.03% and 0.4% and in replacement donor was 2.9%, 1.8%, 0.4%, 0.2% and 0.1% respectively. The difference was significant ($P < 0.05$). **Conclusion:** There was high prevalence of transfusion transmitted infections among replacement donor. The seroprevalence of HBV, HCV and HIV was relatively high. Therefore, through the use of a highly sensitive screening assay, blood donation should be screened.

Key words: blood components, seroprevalence, Transfusion transmitted infections

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INTRODUCTION

The World Health Organization (WHO) reports that 118.2 million blood donations are made worldwide, with 58% occurring in low- and middle-income nations. Although giving blood might help people live better lives, it is nevertheless one of the main ways that infectious organisms are spread.¹ Transfusion-transmitted infections (TTIs) refer to infections that can be transmitted through the transfusion of blood or blood products from an infected donor to a recipient.² While significant efforts are made to ensure the safety of the blood supply through careful screening and testing of donated blood, there is still a small risk of transmitting certain infections through transfusions. Commonly tested infections include HIV, hepatitis B and C, syphilis, and others.³

Transfusion-related morbidity and mortality are more likely when infectious blood and blood components are used. Both for the patient and their family, as well as their communities, this has very serious repercussions.⁴ The financial effects of TTIs include,

but are not limited to, the need for medical attention, rising dependency rates, and the loss of an employable workforce, imposing heavy demands on the already overburdened social and health care systems as well as the federal budget. Blood donation centers have strict protocols for screening potential donors and testing donated blood for infectious agents. These protocols are designed to identify individuals who may have infections that could be transmitted through blood products.⁵ Donors are asked about their medical history and behaviors that could put them at risk for infections. Various pathogens can potentially be transmitted through transfusions, including viruses, bacteria, parasites, and prions.⁶ The present study was conducted to assess seroprevalence of transfusion transmitted infections amongst blood donors.

MATERIALS & METHODS

The present study consisted of 265 donors of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. A careful physical examination was done. Assessment of weight, height, hemoglobin level etc. was recorded. The screening tests were performed by following the current national guidelines and the manufacturer's instructions. The TTI screening section used the

electrochemiluminescence immunoassay to screen for HBsAg, anti-HCV, HIV, and anti-TP. The screening for malarial parasite was performed by enzyme-linked immunosorbent assay. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 265		
Gender	Male	Female
Number	155	110

Table I shows that out of 265 patients, males were 155 and females were 110.

Table II Type of donation

Donation	Number	P value
Voluntarily	92	0.05
Replacement	173	

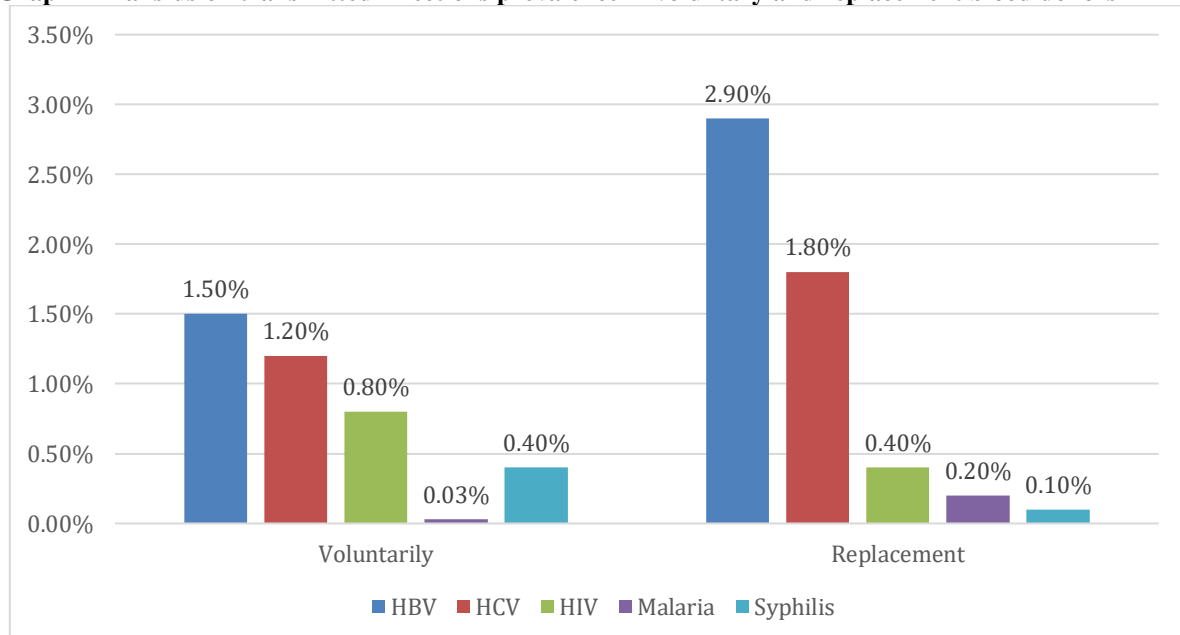
Table II shows that type of donation was voluntarily in 92 and replacement in 173. The difference was significant (P< 0.05).

Table III Transfusion transmitted infections prevalence in voluntary and replacement blood donors

Donation	HBV	HCV	HIV	Malaria	Syphilis	P value
Voluntarily	1.5%	1.2%	0.8%	0.03%	0.4%	0.04
Replacement	2.9%	1.8%	0.4%	0.2%	0.1%	

Table III, graph I shows that transfusion transmitted infections prevalence in voluntarily donor for HBV, HCV, HIV, Malaria and syphilis was 1.5%, 1.2%, 0.8%, 0.03% and 0.4% and in replacement donor was 2.9%, 1.8%, 0.4%, 0.2% and 0.1% respectively. The difference was significant (P< 0.05).

Graph I Transfusion transmitted infections prevalence in voluntary and replacement blood donors



DISCUSSION

Blood donations are typically tested using sensitive laboratory methods, such as nucleic acid testing (NAT), enzyme immunoassays (EIAs), and other serological tests. These tests are designed to detect the presence of infectious agents in donated blood. The window period is the time between initial infection and when the infection can be reliably detected by

tests.⁷ During this period, an infected person may test negative for the infection even though they are carrying the infectious agent. This is why multiple testing methods and a combination of tests are used to minimize the risk of transmitting infections.⁸ Blood centers follow stringent protocols to minimize the risk of transfusion-transmitted infections. These include donor eligibility criteria, thorough questioning of

potential donors, and advanced testing technologies.^{9,10} The present study was conducted to assess seroprevalence of transfusion transmitted infections amongst blood donors.

We found that out of 265 patients, males were 155 and females were 110. Saba et al¹¹ in their study a total of 41,817 donors donated blood were screened for HBV, HCV, HIV, syphilis, and malaria. To ensure donor privacy, donors were identified via codes and no personal information was available. The study included a total of 41,817 donors 41,493 (99.22%) males and 324 (0.78%) females. Of them, 22,343 (53.43%) were voluntary donors while 19,474 (46.57%) were replacement donors. An overall TTI prevalence rate of 4.61% was found. The TTI prevalence rate in voluntary donors was 3.90% while 5.42% in replacement donors. The overall prevalence of HBV, HCV, HIV, syphilis, and malaria was 1.95, 1.38, 0.23, 0.91, and 0.14%, respectively.

We observed that type of donation was voluntarily in 92 and replacement in 173. Chandekar et al¹² study was undertaken with the aim of determining the seroprevalence of TTI in healthy blood donors in a tertiary care blood bank. Serum samples were screened for hepatitis B surface antigen (HBsAg), antibodies to human immunodeficiency virus (HIV) type 1 and 2, hepatitis c virus (HCV) and syphilis using enzyme-linked immunosorbent assays with the third generation kits and venereal disease research laboratory test, respectively. A total of 76,653 healthy donors were included out of which majority of donors were male (91.79%). The overall seroprevalence of HIV, HBsAg, HCV, and syphilis were 0.26%, 1.30%, 0.25%, and 0.28%, respectively.

We found that transfusion transmitted infections prevalence in voluntarily donor for HBV, HCV, HIV, Malaria and syphilis was 1.5%, 1.2%, 0.8%, 0.03% and 0.4% and in replacement donor was 2.9%, 1.8%, 0.4%, 0.2% and 0.1% respectively. Keleta et al¹³ in their study a total of 1939 donors were included. Majority of the donors were males (88.2%), urban residents (68.8%), greater than 25 years of age (67%), and family replacement blood donors (FRBD) (59.7%). Two hundred and fifty (12.9%) donors were infected by at least one TTI. The cumulative seroprevalence of Human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus and syphilis were 16 (0.8%), 97 (5%), 13 (0.7%) and 140 (7.2%), respectively. Out of the total 266 infected donors, the prevalence of co-infection was 16 (0.8%). In the adjusted model, the OR and 95% CI for the seropositivity for any TTI associated with age, no formal education, elementary school educational level, and junior school educational level were 1.02 (95% CI: 1.01–1.04), 4.4 (95% CI: 2.58–7.49), 2.67 (95% CI: 1.49–4.80), and 2.00 (95% CI: 1.14–3.52), respectively. In addition, blood from FRBD had an increased likelihood of contamination with at least one TTI, with an OR (95% CI) of 1.56 (1.10–2.21).

The limitation the study is small sample size.

CONCLUSION

Authors found that there was high prevalence of transfusion transmitted infections among replacement donor. The seroprevalence of HBV, HCV and HIV was relatively high. Therefore, through the use of a highly sensitive screening assay, blood donation should be screened.

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