

SEROPREVALENCE OF TRANSFUSION TRANSMISSIBLE INFECTED BLOOD DONORS IN NORTHERN PAKISTAN

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ABSTRACT

Background: Transfusion transmitted infections need a serious monitoring as it can be transmitted through apparently fit blood donors and threatens the health of patients requiring transfusion of blood. In terms of economy it imposes inconveniences for the accessibility of safe blood products in medical care services with limited resources.

Objective: The aim of the present study is to evaluate the seroprevalence of TTIs among the apparently fit and asymptomatic blood donors in Northern Pakistan.

Materials and Methods: A prospective observational study was conducted in 6 public, 1 private and 2 standalone blood banks for the duration of two years i.e 1st January 2012 to 31st December 2013. Screening for Hepatitis B surface antigen, Anti HCV and Anti HIV was done by ELISA methods. Syphilis was screened by rapid plasma reagin (RPR). Screening of malaria was done by thick film and immunochromatographic method.

Results: A total of 204942 donors donated blood were screened. Males comprised 98.7% while females were only 1.3%. Maximum blood donors were in the age group of 18-29 years (59.4%) followed by age group of 30-49 years (40.1%) and the least donation were in the age >50 years (0.5%). A total of 3.9% (n=8034) were infected for transfusion transmitted infections. HBV infection was the most common TTI 2.07% (n=4253), second was HCV 1.5% (n= 3189) followed by syphilis 0.16% (n=340) and then malaria 0.16% (n=340) and HIV 0.07% (n=144).

Conclusion: This is the first local study which was done on such high scale in Northern Pakistan showing the prevalence of TTIs in donor population. There is need of stringent donor selection criteria along with emphasis on voluntary blood donation and use of standardized methods for screening of HBV, HCV, HIV, syphilis and malaria in blood donors.

Keywords: Transfusion transmitted infections, HBV, HCV, HIV

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INTRODUCTION

Blood transfusion is a vital therapeutic modality for millions of people worldwide.¹ Provision of screened blood products is of greatest need in health care settings. Approximately in Pakistan 1.2-1.5 million units are being annually transfused. However, blood transfusion is associated with hazards of transmitting infections such as HIV, HBV, HCV, syphilis and malaria.² In developing countries such as Pakistan, health care systems are compromised by shortage of blood.³ Voluntary blood donors are better than those donations which are based on replacement because their behavior is better and are donating blood for an

unknown patient without any benefit. Strict implementation of donor selection which should be continuous along with use of standardized screening procedures for TTIs will help us to exclude the blood donors from donation which are infected with transfusion transmitted infections.⁴ Hepatitis C virus belongs to family of Flaviridae causing liver disease. It is a significant challenge of health issues nowadays.⁵ HCV is present in almost 3% of the whole population in the world representing 175 million Global disease burden.⁶ Studies have proven that blood transfusion and intravenous drug abuse

was the most frequent route for transmission of virus.⁷ Hepatitis C results in a chronic disease and progress very slowly and causes cirrhosis and hepatocellular carcinoma.⁸ Infection of hepatitis B has a diverse clinical spectrum from subclinical state to fulminant disease. It also results in cirrhosis of liver and hepatocellular carcinoma. The serum HBV-DNA (viral load) and length of infection are the main factors which need to be considered in the risk of developing complications of HBV. The grave consequences of these diseases need to be kept in mind and also remain vigilant about the possible spread of these infections.³ Human immunodeficiency virus is the retrovirus that attacks and destroys helper (CD24) T lymphocytes. In these infected patients cell mediated immunity is lost and increases chances for host to develop opportunistic infections. Global estimate of HIV infections has proven that 36.7 million people are infected with it at the end of 2016. The burden of HIV varies among different countries and regions. Uptil now Sub-Saharan Africa has been found to be the most severely affected region.¹¹ *Treponema pallidum* causes syphilis. Routes of transmission include blood transfusion, sexual contact and vertical transmission from mother to fetus.⁹ GARPR (Global Aids Response Progress Reports) report has estimated that global incidence of syphilis is 25.1 case /100,000 adult population in 2014.¹⁰ Malaria is caused by four species of *Plasmodium* which are *falciparum*, *vivax*, *malariae* and *ovale*. It is an important parasitic infection worldwide.⁴ Many studies had been conducted earlier in Pakistan to demonstrate the incidence of transfusion transmitted infections but hardly any of them showed the frequency of TTI's in Northern Pakistan on such sized scale. The objective of the present study was to evaluate the prevalence of HBV, HCV, HIV, syphilis and malaria among asymptomatic blood donors of Northern Pakistan i.e Khyber Pakhtunkhwa. This analysis will help to adopt and improve screening

practices against high prevalence diseases and also create awareness for screening among the blood donors.

OBJECTIVE

The aim of the present study was to evaluate the seroprevalance of transfusion transmitted infections among the apparently fit and asymptomatic blood donors in Northern Pakistan.

METHODOLOGY

A prospective observational study was conducted in 6 public, 1 private and 2 stand alone blood banks for the duration of two years i.e 1st January 2012 to 30th December 2013. Donor selection was done under the guidance of WHO recommendations. Informed consent were taken from all the blood donors.¹² National Committee for Clinical Laboratory studies (NCCLS) recommendations were used to collect samples.¹³ Serum was collected from clotted blood. Screening for Hepatitis B surface antigen, Anti HCV and Anti HIV was done by ELISA methods. Syphilis was screened by rapid plasma reagin (RPR). Screening of malaria was done by thick film and immunochromatographic method. Samples with positive result for infection were analyzed further by repeating the same technique of test on the same sample.

RESULTS

A total of 204942 donors donated blood were screened. A total of 3.9% (n=8034) were infected for transfusion transmitted infections. HBV infection was the most common TTI 2.07% (n=4253), second was HCV 1.5% (n= 3189) followed by syphilis 0.16% (n=340) and then malaria 0.16% (n=340) and HIV 0.07% (n=144).

Blood donors distribution according to sex

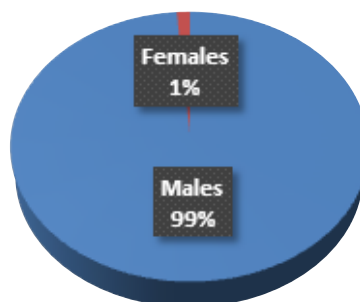


Figure-1: Blood donors distribution according to sex

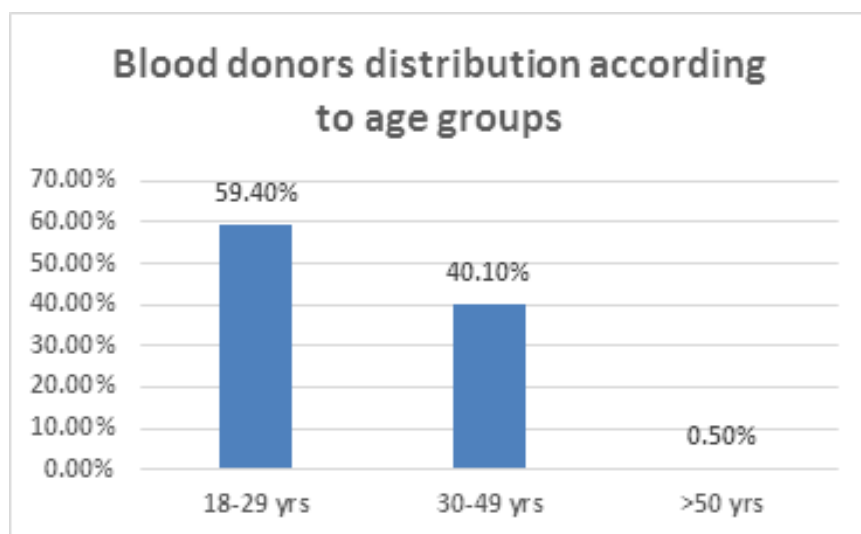


Figure-2: Blood donors distribution according to age-groups

Table-1: Seroprevalence of TTIS in asymptomatic blood donors

TTIs	No of positive subjects	Prevalence percentage (%)
HIV	144	0.07%
HBV	4253	2.07%
HCV	3189	1.5%
Syphilis	340	0.16%
Malaria	108	0.05%
Total	8034	3.9%

Table-2: Seroprevalence of TTIS in different cities of Pakistan

Study	City	Year	HBV	HCV%	HIV%
Hussain et al ¹⁶	Multan	2013	2.32%	3.44%	0.01%
Waheed et al ¹⁷	Islamabad	2011	3.91%	8.34%	0
Sultan et al ¹⁸	Lahore	2005	3.36%	3.21%	0.04%
Farooqi et al ²⁰	Peshawar	2007	2.54%	3.21%	-
Nazar et al ²¹	Karachi	2008	1.71%	2.06%	-

DISCUSSION

Blood transfusion is an indispensable therapeutic modality but patients are continuously facing challenges of hazards of TTIs. The exact number of TTIs are not known in our population until now due to unavailability of screening tests, surveillance system and limited access to health facilities.¹⁴ Implementation of stringent donor screening ensures the safe supply of blood components but also provides us about the figures of TTIs in our region. Khan et al showed that maximum of the blood donors in Pakistan

are donating blood first time, which is a true evidence of infection among the population.¹⁵

Most of the studies conducted in different cities of Pakistan such as Multan,¹⁶ Islamabad,¹⁷ Lahore,¹⁸ Rawalpindi,¹⁹ Peshawar²⁰ and Karachi²¹ showed the prevalence of HBV which ranges from 1.7% -3.9% and it is more or less the same with 2.07% found in the present study. World wide prevalence of HBV is very diverse. Studies conducted at Nepal (0.46%),²² India (1.7%),²³ Bangladesh (1.20%)²⁴ and United States

(1/270,000)²⁵ had prevalence of TTIs lower than our study while studies of Thailand (4.61%)²⁶ and Nigeria (8.1% and 4.1%)^{27,28} showed frequency more than that of our study.

Our study showed prevalence of HCV was 1.5%. Farooqi et al²⁰ also showed the prevalence of HCV in the same city of Pakistan about 3.21% which is comparable to our study. While studies conducted in different cities of Pakistan showed prevalence of HCV to be 2.06%-8.34% which is much higher as compared to our studies.¹⁶⁻²¹ The prevalence of HCV is rising due to no vaccine against the virus while decrease in infection of HBV has been observed due to availability of vaccine and large scale immunization programme. The prevalence of HCV in present study is higher in comparison to International studies conducted in India,²³ Nepal,²² Eritrea³⁰ and lower than in Nigeria^{27,28} and Thailand.²⁶

Prevalence of HIV in our study was 0.07% . In comparison with global prevalence of HIV studies conducted in Nigeria showed higher prevalence of HIV i.e 3.1%-4.2%.^{27,28} High risk behaviour such as multiple sex partners, unprotected sexual intercourse and intravenous drug abuse can be attributed to higher prevalence found in Nigeria. Prevalence of HIV in Nepal,²² Eritrea³⁰ and Thailand²⁶ is also little higher in comparison to our study. Studies from different cities of Pakistan showed prevalence of HIV to be 0.3%-0.69% which is comparable to our study.

Prevalence of syphilis in our study was 0.16% which is lower on comparison to other studies from Pakistan^{19,21} and Waheed et al¹⁷ showed prevalence of syphilis to be 0.89% which is comparable to our data. For comparison of syphilis globally few studies are conducted upto now. However prevalence of syphilis in Nigeria is 1.1%²⁷ which is higher than our study while result of study in India²³ showed 0.04% cases of syphilis in blood donors which is comparable to our study. Prevalence of malaria in our study was 0.05% which is lower than other studies of Pakistan while Bangladesh²⁴ showed prevalence of syphilis to be 0.34% and no blood donors were infected with malaria in India.²³

This is the first local study which was done on such high scale in Northern Pakistan showing the prevalence of TTIs in donor population. Donors who were positive for TTIs were informed and then referred to general physician. Prevention of TTIs should be our aim. There is need of stringent donor selection criteria along with emphasis on voluntary blood donation and use of standardized methods for screening of blood donors for HBV, HCV, HIV, syphilis and malaria.

CONCLUSION

This is the first local study which was done on such high scale in Northern Pakistan showing the prevalence of TTIs in donor population. There is need of stringent donor selection criteria along with emphasis on voluntary blood donation and use of standardized methods for screening of HBV, HCV, HIV, syphilis and malaria in blood donors.

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