ORIGINAL RESEARCH PAPER

Pathology

KEY WORDS: Sero-prevalence, Transfusion-transmissible infections, Blood donors

DETERMINATION OF THE SEROPREVALENCE OF TRANSFUSION-TRANSMISSIBLE INFECTIONS (TTIS) AMONG HEALTHY BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN NORTH INDIA

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ABSTRACT

Objective: To determine the sero-prevalence of TTIs among healthy blood donors in a tertiary care hospital in north India.

Methods: This was a retrospective study. Blood bank donor cards were used as a source of information. HIV, HBV and HCV tests were done by enzyme-linked immunosorbent assay (ELISA) procedure using the third generation kits. Syphilis was diagnosed by performing the standard laboratory test. Malaria testing was done by slide method using Leishman's staining. Blood donors were selected if they fulfilled all the criteria to be eligible for donation as described by the standard operating procedure of institution's blood bank.

Results: About half of donors were between 18-25 years of age (49.5%). Majority of donors were males (71.2%). 36.3% were students. Majority of donors were voluntary donors (80.2%). Most of the donors were first time donors (41.6%) followed by second (30.7%), third time (17.5%) and four & above (10.2%). The overall sero-prevalence of infections was 5.9%. The sero-prevalence of HCV was found to be higher (1.8%) than HBV & syphilis (1.2%), HIV (0.9%) and malaria (0.7%)

Conclusion: The study reflects the sero-prevalence of the general population in the study area which may be helpful in planning public health interventional strategies.

INTRODUCTION

Blood transfusion is an important therapeutic intervention in patient management.[1] Hypersensitivity reactions and direct risk associated with spectrum of transfusion-transmissible infections (TTIs). These includ human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Syphilis-causing *Treponema palladium* (*T. pallidum*) are the major issues.[2]

The prevalence of TTIs among blood donors varies across the countries.[3,4] Complications of blood transfusions can be mild. It can be life-threatening. Hence, meticulous pretransfusion testing and screening for TTIs are mandatory.[5] These also cause fatal, chronic, and life-threatening disorders. 12.5% of patients who received blood transfusion may be at risk of post-transfusion hepatitis.[6] Evaluations of TTI are essential for assessing the safety of blood supply and monitoring the efficiency of currently employed screening procedures.[7] The present study was carried out with the aim to determine the sero-prevalence of TTIs among healthy blood donors in a tertiary care hospital in north India.

MATERIAL AND METHODS

This was a retrospective study carried out at tertiary care hospital in north India over a period of one year. Blood was collected from apparently healthy individuals after detail history and examination aged 18-60 years with weight >45 kg and hemoglobin concentration >12.5 gm%. All blood donor's samples were analyzed for different infections. Blood bank donor cards were used as a source of information. HIV, HBV and HCV tests were done by enzyme-linked immunosorbent assay (ELISA) procedure using the third generation kits. Syphilis was diagnosed by performing the standard laboratory test. Malaria testing was done by slide method using Leishman's staining. Blood donors were selected if they fulfilled all the criteria to be eligible for donation as described by the standard operating procedure of institution's blood bank. The descriptive statistics are prese nted.

RESULTS

About half of donors were between 18-25 years of age (49.5%). Majority of donors were males (71.2%). 36.3% were students. Majority of donors were voluntary donors (80.2%) (Table-1).

Most of donors were first time donors (41.6%) followed by second (30.7%), third time (17.5%) and four & above (10.2%) (Table-2).

A+ve and B+ve blood group was among 27.4% and 24.1% donors respectively. AB+ve and O+ve was in 11.3% and 12.2% donors respectively. A-ve and B-ve was in 7.4% and 5.9% donors respectively (Table-3).

The overall sero-prevalence of infections was 5.9% (Table-4). The sero-prevalence of HCV was found to be higher (1.8%) than HBV & syphilis (1.2%), HIV (0.9%) and malaria (0.7%) (Table-5).

DISCUSSION

The present study was carried out with the aim to determine the sero-prevalence of TTIs among healthy blood donors in a tertiary care hospital in north India. Majority of the donors were between 18 - 25 years of age in this study. Fernandes et al[8] has shown similar age distribution.

Most of the donors in this study were males (71.2%). This finding is in agreement with other studies.[9,10,5,6] Voluntary donors constituted 80.2% in this study. This is similar to the study done by Matee et al[11].

The sero-prevalence of infections was 5.9% in this study. Birhaneselassie[12] found sero-prevalence of infections being 7.1%. Leena and Mohd[13] found 1.35% prevalence for all TTIs. Fessehaye et al[14] showed 3.8% prevalence.

In this study, the sero-prevalence of HCV was found to be higher (1.8%) than HBV & syphilis (1.2%), HIV (0.9%) and malaria (0.7%) which is in agreement with other studies.[15,10,5] However, this sero-prevalence rate is lower than studies done by Matee et al[11], Stokx et al[16] and Tafuri et al[17].

Patients requiring blood transfusion are more prone to acquire HBV, HIV, HCV and syphilis.[18]The less common routes of transmission are sexual intercourse and mother to child transfer.[19] The possibility of window period transmission would be minimized if blood is collected from low risk targeted general public.[20]

CONCLUSION

The study reflects the sero-prevalence of the general population in the study area which may be helpful in planning public health interventional strategies. Methods to ensure a

safe blood supply should be encouraged. Screening with a better selection of donors and use of sensitive screening tests including nucleic acid testing assay will definitely decrease the risk of TTI.

Table-1: Distribution of demographic profile of blood donors

Demographic profile	No. (n=3151)	%
Age in years		
18-25	1561	49.5
26-35	958	30.4
36-45	336	10.7
>45	296	9.4
Sex		
Male	2245	71.2
Female	906	28.8
Occupation		
Service	178	5.6
Farmer	723	22.9
Professional	351	11.1
Housewife	299	9.5
Unemployed	455	14.4
Student	1145	36.3
Type of donor		
Voluntary	2528	80.2
Replacement	623	19.8

Table-2: Distribution of donation frequency

Donor frequency	No. (n=3151)	%
First time	1312	41.6
Second time	966	30.7
Third time	551	17.5
Four and above	322	10.2

Table-3: Distribution of blood group of donors

Blood group	No. (n=3151)	%
A+ve	864	27.4
B+ve	759	24.1
AB+ve	356	11.3
O+ve	385	12.2
A-ve	233	7.4
B-ve	187	5.9
AB-ve	211	6.7
O-ve	156	5.0

Table-4: Overall sero-prevalence of infections

Sero-prevalence	No. (n=3151)	%
Positive	187	5.9
Negative	2964	94.1

Table-5: Distribution of sero-prevalence of different infections of blood donors

Type of Infections	Positive		Negative	
	No.	%	No.	%
HBV	39	1.2	3112	98.8
HIV	29	0.9	3122	99.1
HCV	58	1.8	3093	98.2
RPR (Syphilis)	39	1.2	3112	98.8
Malaria	22	0.7	3129	99.3

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