

PREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS IN VOLUNTARY AND REPLACEMENT DONORS

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ABSTRACT

INTRODUCTION: Transfusion of blood and its components is lifesaving as well as it has life threatening hazards.

AIMS AND OBJECTIVES: The Aim of the study was to find out the prevalence of Transfusion transmitted infections (TTI) in voluntary and replacement donors.

METHODS: This was a Descriptive cross-sectional study which was showing the prevalence of transfusion transmitted diseases over a period of 2 years.

RESULTS: A total of 9324 donors were analyzed for the prevalence of TTI over a period of 2 years. Of these 61.3% were voluntary donors and 38.6% were replacement donors. Prevalence of TTI in total donors was 0.4%. Prevalence of hepatitis B was highest (0.35%) among all the infections followed by HIV (0.08%), HCV (0.02%), VDRL and malaria 0.01% each.

CONCLUSION: Prevalence was more in replacement donors compared to voluntary donors and prevalence of hepatitis B infection is more followed by HIV, HCV, VDRL and malaria. Extensive donor selection and screening procedures will help in improving the blood safety.

Keywords: Voluntary, Replacement, Transfusion transmitted infections.

INTRODUCTION

Transfusion medicine has maintained a heightened awareness of the potential risk of transmitting infection through blood transfusion. Transfusion of blood and its components is lifesaving as well as it has life threatening hazards. With every unit of blood there is a 1% chance of transfusion associated problems including transfusion transmitted diseases¹. A majority of known cases of post transfusion diseases have been caused by Human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Treponema Pallidum and Malarial parasites. Some infectious agents, like cytomegalovirus (CMV), T-lymphotrophic virus (HTLV), Treponema pallidum are transmitted more readily by relatively fresh blood components,

whereas other agents like HIV, HBV are stable in stored, and even in frozen red cells or plasma². The safety of blood is a major source of concern when blood transfusion is required for whatever reason especially in a developing country such as ours, where national blood transfusion services, policies, appropriate infrastructure, trained personnel and financial resource are inadequate. WHO recommends that universally blood for transfusion should be screened for HIV, HBV, HCV and Syphilis. In selected countries depending upon epidemiological evidence, screening should be done for the following also: Malaria, Chagas disease, Human T-cell lymphotropic viruses 1&2 and Human Cytomegalovirus. For infectious diseases, screening should be appropriate in the form of selection of donor by asking proper history in the form of questionnaire, accurate laboratory testing by a variety of methods and by the use of good manufacturing practices, quality systems, accreditation and inspection systems. The residual risk of transfusion transmitted infection is because of inability of the test to detect the disease in pre-seroconversion or window period, lack of trained personnel, immunologically variant viruses, chronic non-seroconverting immuno-silent carriers and laboratory testing errors³. Maintaining a donor population that has a low incidence of infection continues to play a key role in preserving blood safety. Transfusion transmitted infections are still a major concern to patients, physicians and policy makers who wish to see a risk free blood supply.

The aim of the present study was to find out prevalence of transfusion transmitted infections (TTI) in voluntary and replacement donors in our hospital transfusion service set up. This study also aids in evaluating the safety of the collected donations.

MATERIAL AND METHODS

The present study was carried out in Prathima Institute of Medical Sciences Karimnagar. A total of 9324 donors were analyzed for the prevalence of transfusion transmitted diseases over a period of 2 years from July 2016 to June 2018. These include replacement donors who donated for ailing patients were family members, close relatives and friends of the recipient. The voluntary donations primarily were obtained from walk in donors, students and employees of the institute and outdoor blood donation camps. Care was taken to eliminate professional and paid donors by taking history and clinical examination. Basic information regarding age, sex, occupation were obtained. All samples were screened for hepatitis B Surface antigen by (Erba Lisa SEN HbsAg), Human immunodeficiency virus by (Erba Lisa HIV Gen3), Venereal disease research laboratory test by (VDRL kit) and Malaria by Rapid card test (MALCARD -Rapid visual antigen test).

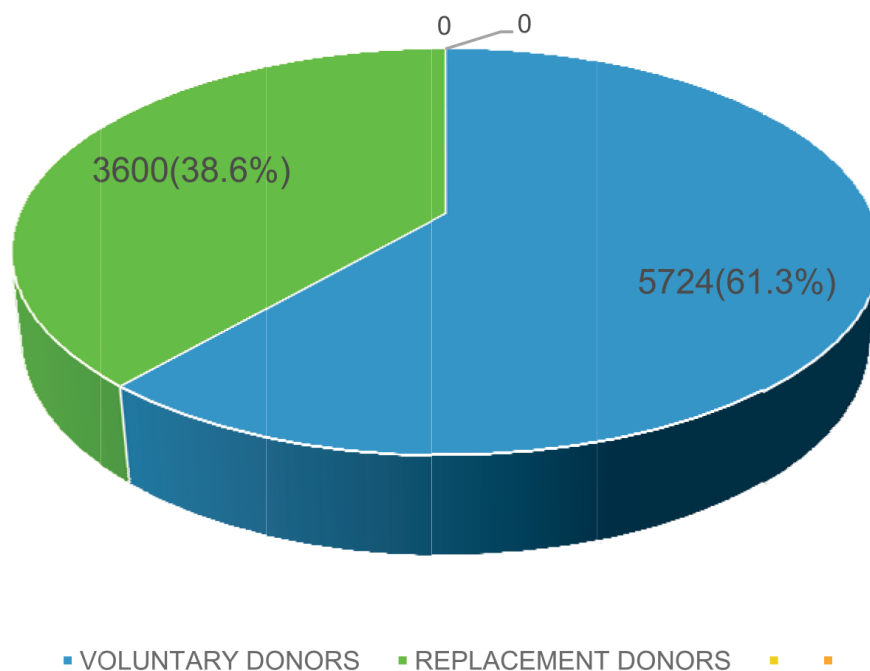
Tests were performed according to the manufacturer instructions. All the reactive samples were repeated in duplicate before labelling them seropositive. The donated blood was discarded whenever the pilot donor sample was found positive for any TTI.

The statistical analysis was done using the Chi-square test

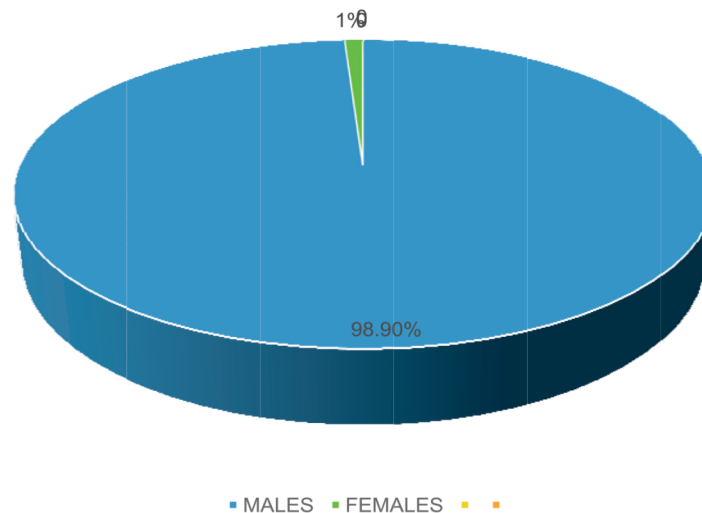
RESULTS

A Total of 9324 donors were enlisted in the study. Of these 5724 (61.3%) were voluntary and 3600 (38.6%) replacement donors. Only 682 were collected throughout-door camps. Males outnumbered females with 9222 (98.9%) donations while only 102 (1%) donors were females. Among these, 6120 (65.6%) of the donors aged from 18 to 27 years, 2502 (26.8%) from 28 to 37 years, 619 (6.6%) from 38 to 47 years, 81 (0.8%) from 48 to 57 years and 2 (0.02%) were >58 years age group. Out of 9324 blood donors, 45 (0.4%) were tested reactive for blood transmitted infections. Out of these 45 reactive cases, 30 (66.6%) were replacement donors and 15 (33.3%) were voluntary donors. The seroprevalence of HBsAg in total donors was 0.35% (33 cases). In this replacement donors (20 cases) had a high incidence as compared to voluntary donors (13 cases). The prevalence for HIV was 0.08% (8 cases) in total donors, which is more in replacement (6 cases) donors as compared to voluntary (4 cases) donors. The seroprevalence of HCV among all donors was 0.02% (2 donors) having marginally high incidence in replacement when compared to voluntary donors which is zero%. The seropositivity of VDRL in total donors was 0.01% (1 donor) with prevalence in replacement donor. One (0.01%) voluntary blood donor tested positive for malarial parasite. In all the five diseases the incidence was high in males and in replacement donors. The concurrent rates for seropositivity were highest for HBsAg followed by HIV, HCV, VDRL and malaria in descending order.

Fig 1: Percentage distribution of total blood donors



The percentage distribution of voluntary donors (61.3%) is more compared to the replacement donors (38.6%) in the present study (fig 1).

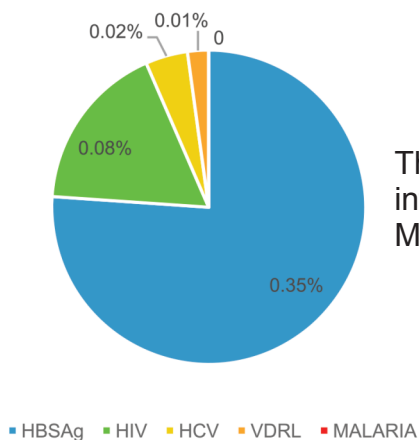
Fig 2: Percentage distribution of blood donors by gender

The percentage distribution of males in the present study was 98.9% whereas in females it is only 1%(fig 2).

Table I: Distribution of transfusion transmitted infections in voluntary and replacement donors.

Cat. Of blood donors	HBSAG	HIV	HCV	VDRL	MALARIA
Voluntary	13	2	0	0	1
Replacement	20	6	2	1	0
Total	33(0.35%)	8(0.08%)	2(0.02%)	1(0.01%)	1(0.01%)

The distribution of transfusion transmitted infections is more in HbsAg (0.35%) compared with HIV (0.08%), followed by HCV (0.02%), VDRL(0.01%), Malaria (0.01%) (Table I).

Fig : 3 Percentage distribution of transfusion transmitted infections in total donors.

The percentage distribution of transfusion transmitted infections is more in HbsAg followed by HIV, HCV, VDRL, Malaria.(Fig3).

Table II: Percentage distribution of transfusion transmitted infections in donors by age group.

Age	HBSAg	HIV	HCV	VDRL	MALARIA
18-27yrs	12	3	1	1	0
28-37yrs	8	2	1	0	1
38-47yrs	6	2	0	0	0
48-57yrs	5	1	0	0	0
>58yrs	2	0	0	0	0

The percentage distribution of transfusion transmitted infections in donors is more in the age group between 18-27yrs followed by 28-37yrs age group (Table II).

DISCUSSION

Transfusion of blood and blood products is a life saving measure and helps enumerable people worldwide. At the same time however, blood transfusion is an important mode of transmission of infection to the recipients. In developing countries the prevalence of TTI is much higher and quite far from attaining a zero risk level at the present moment.

Voluntary donors constituted 61.3% as compared to 38.6% of replacement donors. This finding is similar to the study done by Hilda et al³, Gupta et al⁴. The increase in voluntary donors may be attributed to the increasing public awareness and involvement of government bodies like NACO (National Aids control organization) who actively propagate voluntary donation in our country. However many earlier studies have reported increased number of replacement donors⁵⁻¹⁰. Majority of the donors were aged between 18 to 27 years which is in keeping with the age of college students who are often called to donate at our institution. Other studies have similar age distribution⁸. 98.9% donations were males, a finding similar to the other studies^{5,6,10} this could be explained on the basis that the Indian women have a very high incidence of anemia especially in the child bearing age and hence are likely disqualified while being screened for blood donation.

Overall prevalence of TTI was 0.4% with a higher prevalence in replacement donors and male donors which correlates well with other studies^{4,6,7,11,12}. Many of the Indian studies show prevalence rates for HIV-0.5-3.87%, HCV-0.12-4%, HBSAG-1.2-3.5% and syphilis-0.3-0.82%^{6,7,10,11,13-16}.

A very low prevalence rate of transfusion transmitted infections in our study may be attributed to increase number of donors donating at the blood bank with strict screening criteria when compared to the number of donations from the camps which were conducted outside.

Difference in infection rates between voluntary and replacement donors have been observed in many earlier studies^{8,12,16}. Concealment of the medical history by professional or replacement donors poses a great threat to the safety of blood supply.

Based on the results of the study, to reduce the risk of these infections non-remunerated repeat voluntary donor services need to be Instituted. Extensive donor selection and screening procedures can improve the blood safety. The emphasis must also be laid on voluntary risk reduction, which will require increased awareness and change in the attitude of people. Voluntary blood donation has to be made a part of healthy lifestyle, enlightening the public about the benefits of voluntary blood donations.

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