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Seroprevalence of Transfusion Transmitted Infections among Voluntary Blood Donors in a Rural District Hospital

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Abstract

Background: Transfusion transmitted diseases continues to be a major threat for safe transfusion practices. Lack of study from this part of the country propelled us to conduct this study. *Materials and Methods:* This was a retrospective hospital record based study conducted in a blood bank of a rural tertiary care medical college hospital at Karwar, Karnataka, India. Five year data of blood donors with transfusion transmitted infections (TTIs) were evaluated and analyzed. *Results:* Among the 2655 donors screened, males (88.5%) were predominant. Among donors screened, hepatitis B (0.67%) was the most common TTI screened. No cases of Hepatitis C was seen during the study period. *Conclusion:* Prevalence of TTI amongst blood donors in the present study is comparatively low compared to various studies. Larger studies are necessary to predict overall prevalence in this part of the country. Being a smaller blood bank does give better screening strategies and improved donor recruitment, thereby improving blood safety.

Keywords: Blood Donors; TTI; Rural; Hepatitis B.

Introduction

Healthy donors form the mainstay of medical and surgical therapies since a long time and hence an important part of transfusion medicine. Though collection from various types of donors was practised earlier, the recent court restrains and government regulations have encouraged blood collection from voluntary donors, i.e. donors who donate blood without compulsion or promise of remuneration [1,2].

Transfusions carry the risk of Transfusion transmitted Infections (TTIs) like hepatitis B and C, HIV, malaria and syphilis. India with a wide demographic population base has the second largest global pool of chronic HBV infections. In India, it is mandatory to screen for HIV, Hepatitis B, Hepatitis C, Syphilis and Malaria. Rapid diagnostic tests and ELISA are usually employed for screening of such TTIs. Nucleic acid testing (NAT) is available in few centres and is being introduced all over for its high sensitivity in identifying TTIs. With the availability of better storage techniques and recognition of transfusion therapy as an important field, the safety assessment of blood supply has attained immense importance. Increased incidence of adverse events due to improper laboratory testing, improper screening has provoked TTIs to remain as a major concern for policy makers, health care providers and patients. The complete list of emerging infectious disease agents and their potential threat to transfusion safety (AABB) enumerates 68 agents which have the potential threat of clinical disease and require further consideration. This list illustrates the necessity and the challenges of the near future for blood safety [3-6].

The objective of the present study was to estimate the sero-prevalence of TTI among voluntary blood donors in a rural tertiary care teaching hospital in Northwest Karnataka.

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Materials and Methods

This study was conducted in a district hospital blood bank attached to a medical college in rural Karnataka. This was a blood bank based retrospective study and was executed in district hospital blood bank, Karwar. The statistical data for the past five years was retrieved from various documents and registers maintained at the blood bank. Results of immunological screening tests performed on all donated blood samples viz NAT testing for HIV, rapid card testing for HIV-1 & 2, Hepatitis B and C and Malaria were collected. Donor selection and rejection criteria were strictly followed according to DGHS guidelines. All the reactive samples were repeat tested before labelling it as sero-positive. The sero-positive units were discarded as per standard protocols.

Results

In the present study, among the 2655 donors screened, males (88.5%) formed the predominant group. In all the age groups, males were the predominant donors. Most donors were in the age group of third decade. Eighteen cases (0.67%) of TTIs were identified over a period of 5 years. Among donors screened for TTIs, hepatitis B (13/18) prevalence was very high compared to HIV (2/18), syphilis (2/18), and malaria (1/18). No cases of donors with Hepatitis C or dual infections were seen during the study period.

Table 1: Prevalence of TTIs in various studies[1,2,4,8,9]

Study	Year	TTI	HIV	Hep B	Hep C	Malaria	Syphilis
Mandal R et al [1]	2016	2.93%	0.42%	1.24%	0.62%	0.004%	0.65%
Chaurasia R et al [2]	2014	2.51%	0.27%	1.38%	0.54%	-	0.32%
Giri PA et al [4]	2012	-	0.07%	1.09%	0.74%	-	0.07%
Sharma DC et al [8]	2014	4.09%	0.13%	3.51%	0.24%	0.03%	0.17%
Raina S et al [9]	2015	0.85%	0.1%	0.49%	0.21%	-	0.03%
Present study	2016	0.67%	0.075%	0.48%	-	0.04%	0.075%

Discussion

In 1975, World Health Organisation recommended a resolution to make all member states adopt voluntary non-remunerated regular blood donation to reduce the risk of unsafe blood transfusion. India adopted the WHO recommendations in 1998. Unsafe blood transfusion has far reaching consequences for recipients, their families, and the society. Further, unsafe practices offer economical burden to health sector [7,8]. Although literature search for TTI reveal numerous studies, study conducted in rural India are sparse. The present study was conducted to assess the prevalence of TTI among blood donors in rural district hospital.

Female were represented by smaller number as is commonly seen in the subcontinent. Low number of females could be attributed to large population of females being underweight, anaemic and the continuing social practise of gender neglect [8].

The overall TTI prevalence in our present study was 0.67%, which is comparatively lower in comparison to other studies as shown in Table 1 [1,2,4,8,9]. Infectivity of HBV among donors in India varies between 0.66-12%. The present study revealed prevalence of HBV to be 0.48% which was high compared to other TTIs. The major route of transmission of HBV is parenteral. HBV is the most infective among blood borne viruses [5]. Similar studies have shown comparable incidence rates of TTIs [1]. Strict adherence to guidelines for donor screening and low prevalence of such infections in local population could be the reasons for the overall low prevalence of TTIs among donors in the present study.

There were no cases of HCV during the study period. In India, prevalence of HCV among TTIs is expected to be around 0.5-1.5%. (1) HCV infected people have a higher risk of cirrhosis and hepatocellular carcinoma than HBV infected people [8].

The seropositivity for HIV was very low (0.07%) in the present study. All the positive cases were identified during the initial year of the study. No cases were identified in the subsequent years of the study despite application of NAT. Even though India shelters a large population of people with HIV/ AIDS, increasing awareness of this immune suppressing life threatening disease among the general population, increasing financial support towards prevention and treatment as well as government organized AIDS awareness programs could be contributing towards the decreasing pattern [7].

Only one case of syphilis was identified in the present study. Various studies have shown

prevalence of syphilis among TTIs to be between 0.85-3% [1].

Two cases (0.07%) of malaria were identified in the present study. In endemic countries, the rate of transfusion transmitted malaria is shown to be around 50 cases per million. Our results are comparable to national data which varies from 0.01%-0.09. NACO guidelines suggest that the donors affected with malaria should be temporarily deferred for a period of three months [1-8].

There is 1% chance of transfusion associated problems, including TTI with every unit of blood. High income countries have shown a decline in the risk of TTI, however, the same cannot be said for developing countries like ours. Vigorous and continuous screening among the donors is a must for safe blood transfusion. A zero risk of TTI due to blood transfusion is absolutely necessary. There is an urgent need for effective control strategies like stringent screening of all blood donors, public awareness programmes and uniform implementation of laboratory screening tests [5]. Also strict adherence to national blood policy – an action for blood safety, which advocates notification to all reactive donors, is absolutely necessary. Donor notification is challenging and requires counsellor support [2]. In the hospital setups, TTIs are known to be high amongst replacement donors compared to voluntary blood donors. Additionally, first time donors are known to be commonly riskier compared to repeat donors, who should be evaluated with caution. There is a need to recruit voluntary donors, create a donor pool for effective and safe blood transfusion [10-13].

Pre-donation screening and counselling and identification of risk factors have reduced the risk of TTIs. Temporary or indefinite exclusion of high risk potentially infectious donors reduce the risk of TTIs. Another social component that needs to be looked into is the status of permanent donor deferral of MSM (men who have sex with men) donors, which maybe no longer necessary [13,14].

Our study is the first of its kind to be conducted in this rural area. Limitations of this study could be the smaller number of donors. The smaller number of donors in the present study precludes predicting the prevalence of these infections in the local population.

Conclusion

Presently, continuing effort in donor education and donor screening strategies, improved donor recruitment strategies to encourage repeat donors and implementation of NAT testing for HIV at all centres could be critical towards improving blood safety. Although various studies on TTI in blood donors are available from different regions of the country, this is the first study from this part of the country. This study could be a reference point for future studies from this part of the country.

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