
Original Articles

Screening of Donated Blood for Transfusion Transmitted Infections By Serology and Response Rate to Notification of Reactive Results : A Tertiary Care Institutional Experience

Dr. Rohit V. Bhalara*, Dr. Payal Shah**, Dr. Ravi K.Kothari***, Dr. Amit H. Agravat****, Dr. Gauravi Dhruva*****

*Associate Professor, **Assistant Professor, ***2nd Year Resident, ****Associate Professor Professor & Head of Department, Department of Pathology, Pandit Dindayal Upadhyay Medical College, Rajkot

Keywords: Donor counselling, TTI, notification, ELISA

ABSTRACT

Background : Safety for blood Transfusion begins with healthy donors. A basic part of preventing transfusion transmitted infections (TTIs) is to notify and counsel reactive donors. This study analysed trends in the prevalence of transfusion-transmissible infectious pathogens among blood donors and notify them as well as to assess response rate among them. Donor notification and counselling protect the health of the donor and prevent secondary transmission of infectious diseases.

Methods : 38707 blood donations were screened for TTIs, namely, HIV, HBV, HCV, and syphilis, by serology. ELISA testing for anti-HIV, anti-HCV and HBsAg and RPR test for syphilis. All reactive donors were retested in duplicate and notified of their status by communicating through telephone.

Result : We evaluated 329 (0.85%) cases with reactive screening test results (0.617% HBV, 0.016% HCV, 0.134% HIV, and 0.08% syphilis). Only 52.58% of donors (173) responded to notification. The response among voluntary donors was better as compared to the replacement donors (53.61 % versus 40.0 %). Only 99 (57.22%) responsive donors followed their first attendance at referral clinic.

Conclusion : Our study provides prevalence rate of TTIs among donors and importance of proper donor counselling and notification of TTI status to all reactive donors who opt to receive this information.

INTRODUCTION

Although blood transfusion can be a life saving type of therapy for medical and surgical patients, unsafe transfusion practices can put millions of people at risk of transfusion transmitted infections (TTIs).^[1-3] The safety of the blood supply can be estimated by monitoring the prevalence of TTI markers in the donor population. Blood transfusion is safer than ever before through continuous improvements in donor recruitment, screening, testing of donated blood with increasingly sensitive assays, and appropriate clinical use of blood.^[4] Serologic testing for transfusion transmitted diseases had historically been the foundation of blood screening.^[5] Moreover, threat of infectious agents entering the blood supply is not static and may evolve as new pathogens emerge or as old ones change their epidemiological pattern.^[6] Under present scenario in India, during pre-donation counselling process, post donation care and the outcomes of donation are explained. After blood donation, samples are

collected for screening for anti-HIV-1/2, anti-HCV, and HBsAg, RPR for syphilis, and slide/card test for malaria.

In 2002, the Government of India adopted the National Blood Policy "An action plan for blood safety" to ensure safe blood supply. This policy advocates notification to all reactive blood donors. Blood banks are thus now required to obtain written consent from donors at time of donation for screening blood for TTI (Transfusion-transmitted Infections) and whether they wish to be informed about their abnormal tests results.^[7] Most blood banks discard blood that is TTI reactive but do not notify donors of their TTI status due to a lack of resources and trained counsellors.^[8]

In our study If any of the screening tests are abnormal, before notification to the donors the tests are repeated using two assays of differing principles and in duplicate with the same assay so as to avoid notification of false-positive results.

Correspondence Address : Dr. Amit H. Agravat
F-201, Sadguru Vatika, Maruti Nagar-2, Airport Road, Rajkot - 360001.
Email id : amit_agravat@yahoo.com

Blood donors with reactive screening test results are informed by telephone call are requested to come for counselling and referred to integrated counselling and testing center (ICTC) for HIV and medicine and STD clinic for HBV/HCV and syphilis, respectively, for counseling, confirmatory testing, and management. Although the blood policy advocates disclosure of TTI status, donors are not, in practice, informed about their results. The onus lies with the donor to contact the blood bank So counselling, testing, and notification together form the vital link between the donor and safe blood.^[8]

As most of the donors do not expect to hear that they have reactive results they may become extremely distressed to hear this news. These donors may be highly motivated to donate, having desire to help others, or simply want some time off work or may have other motives. This, unfortunately, may leave the donor with a negative feeling towards blood donation or diminish his/her own self-worth.^[9,10] On the other hand, a small minority of individuals appear to ignore notification and continue to donate blood elsewhere.

Donor notification can therefore be a challenging task demanding special skills from the staff involved who should always be prepared to meet new challenges and help donor come to terms with their newly discovered status. We undertook this study to assess the prevalence of TTIs using serology and determine the response rate following notification of reactive status to the donors.

MATERIALS AND METHODS

The present study was an observational study in the form of data analysis performed in Blood Bank of Department of Pathology at P D U Government Hospital in Rajkot from January 2017 to December 2018 total 2 year period. The blood bank at our hospital provides blood for the patients after mandatory TTI testing which were done with the fourth generation ELISA for anti HIV 1/2 and third generation ELISA for HBsAg, and HCV on pilot tubes samples. The tests for syphilis were rapid plasma regain (RPR) with flocculation principle.

If initial serology result was positive, sample was retested again in duplicate. Whenever the results of serology were found to be positive, blood unit was discarded as per hospital SOPs and donor was notified of his/her status either by telephone. through counsellor and give advice to report to the blood bank and for referral to the respective department of the hospital for further management.

In this study, we evaluated the response rate of TTIs reactive donors after notification of their abnormal test results. The case was closed only if the donor did not

respond to any of the three telephone calls. In case of HIV before labeling as nonresponder, the donor's details were shared with DAPCU (district AIDS prevention and control unit) for contact to be done by the network of peripheral social workers.

RESULT

Total 38707 blood donors had donated during the study period. Out of total donation, 38637 (99.81%) donors were voluntary and 329 (0.85%) blood donors were found to be TTI markers reactive. The gender-wise distribution was as follows: there were 36784 males and 1923 female donors. As per the age-wise distribution, 12153 donors were in 18–24 years age group, 21888 were in 25–40 years age group, 4666 in 41–55 years age group.

A total of 38707 donors were evaluated comprising 0.18% replacement and 99.81% voluntary donors. The majority of the donors (97.06%) donated blood for the first time. The demographic details of donors are given in Table 1.

Table 1 : Demographic details shown in table 1 as follows

Demographic details of donations (n = 38707 donors)		
Gender	Number	Percentage
Male	36784	95.04
Female	1923	4.96
Donation type		
Voluntary	38637	99.81
Replacement	70	0.18
Donor repeatability		
First time donors	37570	97.06
Repeat donor	1137	2.93
Age group		
18–24	12153	31.40
25–40	21888	56.54
41–55	4666	12.06

Table 2 : Year wise and gender wise distribution of total blood donations shown in table 2 as follows

Year	Male	Female	Total
2017	16958	716	17674
2018	19826	1207	21033
Total	36784	1923	38707

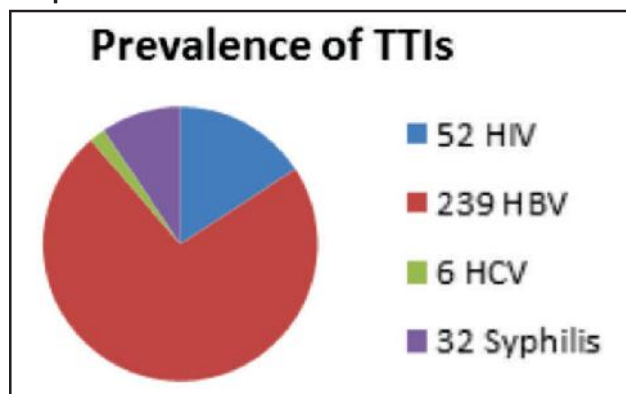
Table 3 : Year wise and type of donation (voluntary or replacement) distribution mentioned in table 3 as follows

Year	Replacement	Voluntary	Total
2017	43	17631	17674
2018	27	21006	21033
Total	70	38637	38707

Table 4 : Prevalence of TTI was 0.617 % for HBV, 0.016% for HCV, 0.134% for HIV, 0.08% for syphilis as mentioned in Table 4 and graph 1 as follows :

Total donor screened	Total reactive donor	Reactivity for test	% Prevalence of TTIs
38707	52	HIV	0.134
38707	239	HBV	0.617
38707	06	HCV	0.016
38707	32	Syphilis	0.08

Graph 1



The HIV reactive responders were referred to the ICTC for counselling and confirmatory testing while the HBV, HCV, were referred to a physician for further management.

Out of these 329 reactive donors, 173 (52.6%) includes both voluntary and replacement donors responded positively to the notification calls and attended counselling at the blood bank and attached government hospital. Among 156 (47.4%) reactive donors who did not respond to the notification, the major reasons were donor's busy schedule, out of city residence, and not willing to visit the blood bank again. The response among voluntary donors was better as compared to the replacement donors. (53.6% versus 40%) these details mentioned in table 5 and graph 2

Only 99 (57.22%) responsive donors followed their first attendance at referral specialties.

DISCUSSION

With over 93 million donations made every year worldwide, blood transfusion continues to save millions of lives each year and improve the life expectancy and quality of life of patients suffering from life-threatening conditions.^[11] At the same time, blood transfusion is an important mode of transmission of infection to the recipients. Prevalence of TTI in India is 1.8–4%, 0.4–1.09%, 0.2–1%, and 0.05–0.9% for HBV, HCV, HIV, and syphilis, respectively^[12–17]. Prevalence of TTI in the present study was in agreement with other seroprevalence studies carried out in various parts of India.

Transfusion safety begins with healthy donors. A fundamental part of preventing TTI is to notify and counsel reactive donors. Donor notification and counselling protect the health of the donor, prevent secondary transmission of infectious diseases to sexual partners, reduces risk of vertical transmission and provide feedback about the effectiveness of donor selection procedures such as pre-donation education and medical history.^[18]

We attempted to contact 329 (0.85%) reactive donors about their TTI status either telephonically. Only 173 (52.6%) reactive donors responded to the notification. In an Indian study by Patel et al. 236 (60.36%) donors showed a positive response following donor notification^[7] In another study by Agarwal et al. involving 416 reactive donors, only 249 (59.8%) donors turned to transfusion facility and attended counselling after receipt of their reactive status^[19] The counselling success rate at large blood centre in southern India was 41.18%, 11.11%, and 14.63% for HBV, HIV, and HCV, respectively.^[20]

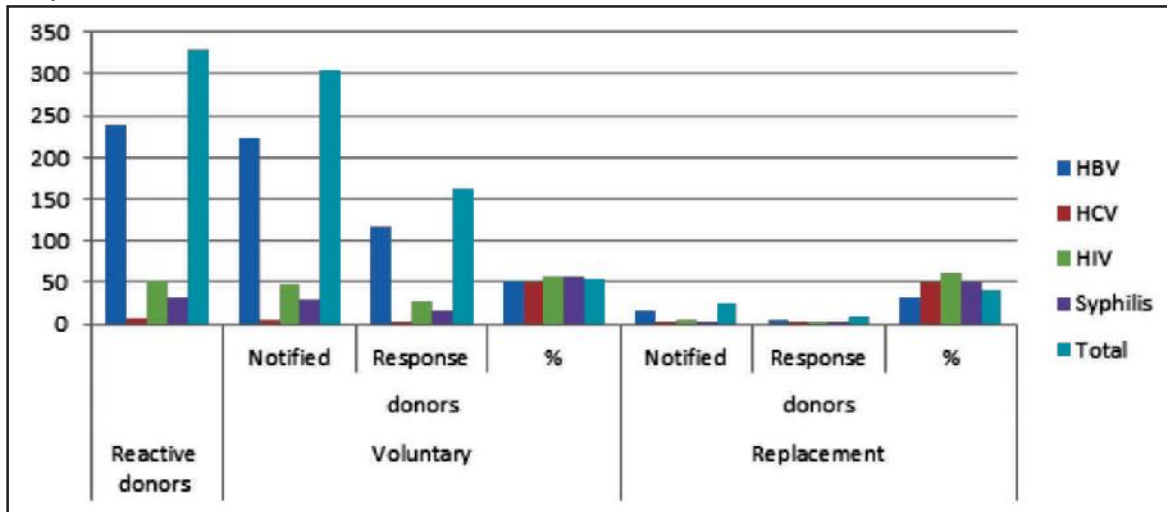
Donor response rate in our study was nearly equal as compared to other studies from the country. In our study non responders are 156 (47.4%). This may be due to poor health care knowledge, social stigma associated with TTIs (especially HIV), and inadequate understanding of implications of screening tests among the general population.^[20, 21] Also, as many of the donors' belonged to far-off places; thus distance could be a reason for the donors not reporting back to transfusion facility. It is difficult to ensure that every donor had understood the meaning and intent of counselling to the best of his / her intelligence. The study by Kleinman et al. reports that following notification 27% of donors contacted the blood centre for further information.^[22]

One more finding of this study that should be a serious concern for blood transfusion authorities is that only 99 (57.2%) of 173 responsive donors responded to the first

Table 5

Name of Serology Tests	Reactive Donors	Voluntary Donors			Replacement Donors		
		Notified	Response	%	Notified	Response	%
HBV	239	239	117	52.4	16	05	31.2
HCV	06	06	02	50	02	01	50
HIV	52	52	27	57.44	05	03	60
Syphilis	32	32	17	56.6	02	01	50
Total	329	329	163	53.6	25	10	40

Graph 2



call and followed up their attendance at the ICTC or with the physicians they were asked to meet. This raises questions about the way donors are counselled and made aware of the consequences of not taking proper treatment

As per objective 4.16 of the Indian action plan for blood safety, the blood donors are counselled about TTIs prior to donation and are offered the option of knowing their seroreactive status provided they give their consent. Low donor response rate suggest that we are not able to meet this goal with reasonable satisfaction.

Transfusion safety rests heavily on the health of blood donors. To improve donor response rate, we have switched to exclusive telephonic notification to all donors who test reactive in screening tests. Donors should undergo optimal pre-donation counselling so as to educate them about the risk of infections and the window period. It is the collective duty of transfusion community to inform these donors and do as much as possible to allay their anxiety about reactive result and to advise them about available treatment

CONCLUSION

Our study was a small endeavour in determining reactive donors' prevalence and their response rate when informed about their reactive status according to results based on screening assay by ELISA. To achieve 100% response rate for contacted reactive donors, it is required to educate the donors at the time of donation about the various TTI, window period, screening tests done, and the importance of informing them the test results. It is also of equal weightage to make donor understand that correct and complete demographic data are crucial for blood bank for informing them test results besides calling them in case of non-availability of blood inventory. There is an urgent need to formulate the nationally acceptable guidelines for notification of all reactive donors.

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