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Transfusion Medicine

SEROPREVALENCE AND INCIDENCE OF TRANSFUSION TRANSMITTED INFECTIOUS DISEASES AMONG BLOOD DONORS IN TEZPUR MEDICAL COLLEGE AND HOSPITAL: A ONE YEAR STUDY.

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ABSTRACT **Introduction:** The transfusion of blood and its components forms an integral part of our healthcare delivery system. A major health and ethical concern regarding blood safety is the prevalence of transfusion transmitted infections. In India, it is mandatory to screen blood donors for HIV, Hepatitis B, Hepatitis C, Syphilis and malaria. Hemovigilance have come up in a big way even in developing countries. The screening for these infectious markers is performed using rapid diagnostic tests and ELISA. The present study was conducted to study the prevalence of transfusion transmitted infections among voluntary and replacement donors at a tertiary care centre in Sonitpur District of Assam. **Materials And Methods:** The present study was carried out for a year from January 2022 to December, 2022 at the Central Blood Bank of Tezpur Medical College and Hospital. All the collected data were studied and analyzed using SPSS software for various parameters. **Result:** A total of 11,524 donations were made during the study period, where approximately 22% were Voluntary Donors and 78% were Replacement Donors. 3.8% (448) were females whereas the rest were males. The total number of donors testing positive for TTIs were 260 in the study period (2.25%). The HIV, HBV, HCV, syphilis and malaria infections were found to be in 0.27%, 0.39% , 0.61%, 0.67% and 0.31% respectively. It is seen that the highest number of TTI is Syphilis closely followed by HCV. **Conclusion:** Blood and its components are highly valuable in healthcare practices and as such extensive measures should be taken to ensure blood safety. Extensive donor selection and screening procedures pre-transfusion would help ensure the same.

KEYWORDS : Transfusion Transmitted Infections, Seropositivity, HIV, Syphillis.

INTRODUCTION

The transfusion of blood and its components forms an integral part of our healthcare delivery system. According to the World Health Organization (WHO), 118.2 million blood donations are collected globally with 58% in low- and middle-income countries.[1] However, a major health and ethical concern regarding blood safety is the prevalence of transfusion transmitted infections. In India, it is mandatory to screen blood donors for HIV, hepatitis B, hepatitis C, syphilis and malaria.[2] Though these strategies have been effective, but transmission of diseases still occurs, primarily because of the inability of the test to detect the disease in the 'window' period of infection, immunologically variant viruses, immune-silent carriers and inadvertent laboratory testing errors.[3] The infectious markers include anti HIV (1 and 2) antibodies, hepatitis B surface antigen (HBsAg), anti-hepatitis C virus antibodies, and malaria antigens, such as histidine rich protein (HRP) and pan-aldolase. VDRL (venereal disease research laboratory)/RPR (rapid plasma reagin) test is done for anticardiolipin antibodies. The testing for anti-hepatitis B core antibody (HBcAb) is optional. The screening for these infectious markers is performed using rapid diagnostic tests and ELISA. Nucleic acid testing (NAT) is done at only a few centers in the country.[4] Most common TTIs are Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Syphilis and Malaria. An effective donor screening protocol for donor selection, proper counseling of donor, sensitive screening tests and effective discarding techniques for reactive units can ensure a reduction in the risk of acquiring TTI.[5]

The transfusion of blood has a key role in health-care services. The financial implications of TTIs include, but are not limited to, the need for medical care, increased levels of dependency, and the loss of useful workforce, placing great burdens on the already overstrained health and social services and on the national budget.[6]

The present study was carried out with the aim to find out the seroprevalence of infectious markers among blood donors of a blood bank in a tertiary care centre in North Eastern part of India, which receives patients and donors from the neighboring areas and even the bordering state of Arunachal Pradesh. As there exists a lacunae of information in this subject of the area, these data will prove useful, not only from an academic perspective but has also the ability to provide vital statistics for healthcare policymakers for upcoming agendas.

MATERIALS AND METHODS

The present study was carried out at the Blood Bank of Tezpur Medical College and Hospital, Assam, India, retrospectively from January 1, 2022 to December 31, 2022 over a period of one year. The ethical clearance for the study was obtained beforehand by the institutional review board. All blood donors (voluntary and replacement) who donated blood at this hospital during the study period were included in this study. The donors from the various Blood camps were included as well. Donor counseling was done for each donor with the help of a pre-made questionnaire and only the donors fulfilling all the criterias were allowed.

Blood analysis:

At our centre, the donated blood is screened for HBV, HCV, HIV, Malaria and Syphilis markers. ELISA is performed on a fully automated platform EVOLIS Walk away system (Biorad, USA) using fourth generation kits for anti-HIV 1 and 2 antibodies and HIV 1 antigen (Genscreen HIV1/2, Bio-Rad), third generation ELISA kits for anti-HCV antibodies (Monolisa, Biorad, USA), hepatitis B surface antigen (HBsAg) (Monolisa™ HBsAg ULTRA, BIO-RAD) and anti-HBc antibodies- IgG+IgM (Monolisa™ Anti-HBc PLUS, BIO-RAD). All samples testing positive by ELISA are repeat tested in duplicate using the same ELISA kit and repeat reactive samples are considered as true reactive. RPR card test (CARBOGEN, Tulip Diagnostics Inc., India) was used for detection of Syphilis.

Statistical analysis:

The data were analyzed using SPSS version 20.0 (SPSS. Inc., USA).

RESULTS

A total of 11,524 donations were made during the study period, where approximately 22% were Voluntary Donors either presenting to Blood Bank of Tezpur Medical College and Hospital or were collected from various blood camps organized in and around the district under the aegis of this Blood Bank. 78% were Replacement Donors who were donating blood for patients admitted in our Hospital as well other private hospital of the district of Sonitpur. 3.8% (448) were females whereas the rest were males. The total number of donors testing positive for TTIs were 260 in the study period (2.25%). The HIV, HBV, HCV, syphilis and malaria infections were found to be in 0.27, 0.39 , 0.61, 0.67 and 0.31 per cent donors, respectively. It is seen that the highest number of TTI is Syphilis closely followed by HCV.

DISCUSSION

In the western world the transmission rates of HIV, HBV, HCV and syphilis through blood transfusion have been reported to be around 1 in

2-5 million, 1 in 0.5-1million, 1 in 2-4 million, 6 in a million, respectively.[7,8] The results of this study is increased than the global values seen. The National AIDS Control Organization (NACO) has reported an overall prevalence of HIV of 0.36 per cent (2006 estimate) in India.[9] In the present study, almost similar values have been found. World Health Organization has placed India in the intermediate zone (2-7% prevalence rates) of prevalence of Hepatitis B.[10]

Some studies have shown high sero-positivity rates of TTIs in replacement donors compared to voluntary donors, a similar finding was noted in our study.[8,11,12]

Table 1: Comparison of seroprevalence in various other studies.

Study	HIV (%)	HBsAg (%)	HCV (%)
Pahuja S et al13	0.56	2.23	0.66
Arora D et al14	0.3	1.7	1.0
Chandra T et al15	0.23	1.96	0.85
Makroo R N et al16	0.24	1.18	0.43
Srikrishna A et al17	0.44	1.86	1.02
Giri PA et al18	0.07	1,09	0.74
Bhattacharya P et al19	0.28	1.46	0.31

CONCLUSION

This study concludes that there is a significant number of transfusion transmitted infections among the donors presenting to our place of study. It is mostly seen in replacement donors and most of the donors presenting to our Blood Bank are replacement donors. As such, strict vigilance is of utmost importance for safe blood practices and also for preventing wastage of blood.

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