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Prevalence of Hepatitis B, Hepatitis C, HIV and Syphilis Infections Among the Blood Donors at a District Hospital and at a Tertiary Care Centre: A One Year Retrospective Study

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ABSTRACT
Blood donation, crucial yet infection-prone, mandates robust screening at blood Centres to prevent transmission of diseases like Hepatitis B, Hepatitis C, HIV and syphilis. Donors, unaware of infections, can learn about their status, enabling early treatment. To determine the prevalence of Hepatitis B, HCV, HIV and Syphilis infections among blood donors at a District Hospital and a tertiary care centre. A retrospective study (Oct-Sep 2022-2023) at Joysagar Civil Hospital and Jorhat Medical College involved 5,400 and 13,405 donors, respectively. Donor's history and lab tests were reviewed and statistically analyzed. In the study, 1.70% (92 donors) of the 5,400 blood donors at Joysagar Civil Hospital were infected, including 0.35% with HBV, 0.46% with HCV, 0.20% with HIV and 0.68% with VDRL. At Jorhat Medical College, out of 13,405 donors, 0.40% had HBV, 1.05% HCV, 0.55% HIV and 0.22% syphilis. Males exhibited notable infection prevalence, constituting the majority of donors. The study emphasizes ongoing vigilance in blood screening and safety measures. Gender and age disparities in infection rates underscore the need for targeted awareness campaigns. Valuable insights from the study can enhance blood donor selection criteria, aiding infection prevention and ensuring safe blood transfusions and donor health.

INTRODUCTION

Blood transfusion service is mandatory and a therapeutic procedure, as there is no genuine substitution to save the life of many patients who suffer from the loss of blood. However, for proper functioning of a blood Centre a healthy number of donations regularly needed to maintain a sufficient stock. Here voluntary and replacement donors plays a very important role in providing the stock. But mere collection of blood and stocking does not suffice. Blood though life saving, might be a carrier of major infections and can cause morbidity and mortality of patients. The presence of blood-borne infections in blood of asymptomatic donors is the major cause of transmitting infectious agents through blood transfusion[1]. The transmission of infectious diseases through blood transfusion is a significant concern for ensuring the safety and efficacy of blood transfusion services. Hepatitis B, hepatitis C, HIV, syphilis are among the most common blood born infections worldwide. Approx, 30% of world population is affected by Hep-B. The prevalence of chronic HBV infection in Indian ranges from 2-10%. The global burden Hep-C is around 71 million people currently. HIV too has upsurged as a major killer disease affecting around 70 million people. Therefore the World Health Organization (WHO) recommends that all blood collected should be tested for major transfusion transmissible infections (TTIs) caused by these pathogens prior to donation[2]. Concurrently the donors, who might not be aware of the infections, comes to know about his status and thus can receive treatment at the earliest for his ailment. This paper aims to investigate the prevalence of these infections among blood donors at a District Hospital blood Centre, as it is crucial for assessing the risk of transmission and implementing effective preventive measures.

Aims and objectives: To determine the prevalence of Hepatitis B, HCV, HIV and Syphilis infections among blood donors at a District Hospital and at a tertiary care centre through a retrospective analysis of one year's worth of data.

Objectives:

- To assess the prevalence of hepatitis B, hepatitis C, HIV and Syphilis infections among blood donors
- To identify any demographic trend associated with the prevalence of these infections
- To analyze the implications of the findings on blood safety and donor selection protocols

MATERIALS AND METHODS

Place of study: The data were collected from the blood centre of Joysagar Civil Hospital, situated in Sivasagar district of Assam and also from the blood centre of Jorhat Medical College, situated in Jorhat district of Assam.

Study design: A hospital based retrospective study of blood donor data recorded on Joysagar Civil Hospital Blood Centre and Jorhat Medical College Blood Centre from 1st-30th October-September 2022-2023 was undertaken.

Duration of study: 1 year (from 1st-30th October-September 2022-2023)

Study population: Voluntary and replacement blood donors who were attended at Joysagar Civil Hospital and Jorhat Medical College and Hospital during the study period of 1 year. Blood donors who were physically fit, aged between 18 and 65 years and had a body weight greater than 50 kg were included in the study.

Inclusion criteria: The total sample number includes the number of blood donors donating during the study period.

Exclusion criteria: Second donation by same donors shall be excluded (during study period).

Laboratory examination: All blood donor's samples were tested for Hbs Ag, antiHCV, HIV and Syphilis using Enzyme Linked Immuno-Sorbent Assay (ELISA) test kit.

RESULT

Demographic characteristics of blood donors: A total of 5400 blood samples donated to Joysagar Civil Hospital and 13405 blood samples donated to Jorhat Medical College from 1st-30th October-September 2022-2023 were retrieved. Of the total, 99% donors at Joysagar Civil Hospital were male whereas at Jorhat Medical College and Hospital 99.5% donors were male. The majority of donors were within the age group of 18-40 years at both the hospitals. Of the total donors, majority were replacement donors.

DISCUSSIONS

Blood born infections are common serious hurdles of blood transfusion. In the present study majority of the donors were male (99% in Joysagar Civil Hospital and 99.5% in Jorhat Medical College and Hospital) which is comparable to the study done by Rao and Annapurna *et al.,*[3] in Pune and Rose*et al.*[4] in Vellore. Majority of the donors in our study were aged between 18-40 years, hence rate of TTI was found to be more in the age group of 18-40 years. Though the prevalence of HBV positivity among the Indian national healthy donor is 4.7%, In our study the sero-prevalence of HBV was 0.36% and 0.40% among the blood donors

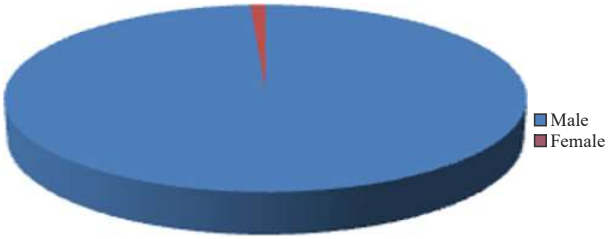

Fig. 1: Pie chart showing gender wise distribution of blood donors at Joysagar civil Hospital blood Centre

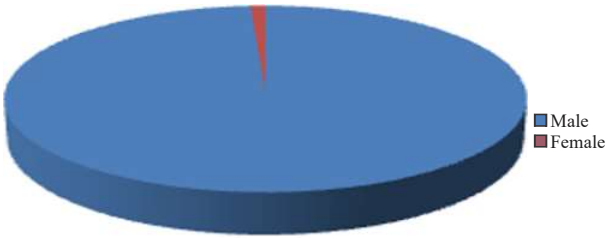

Fig. 3: Pie chart showing gender wise distribution of blood donors at Blood Centre of Jorhat Medical College and Hospital

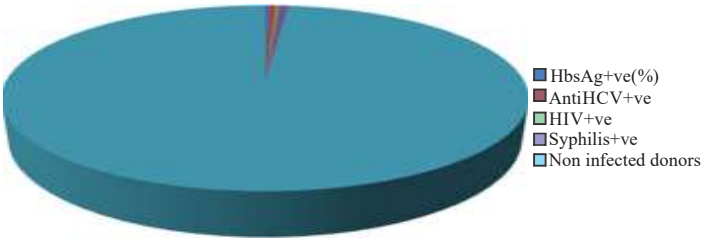

Fig. 2: Pie chart showing distribution of transfusion transmitted infections among blood donors of Joysagar Civil Hospital

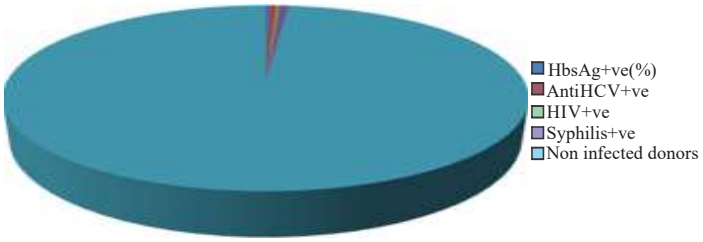

Fig. 4: Pie chart showing distribution of transfusion transmitted infections among blood donors of Jorhat Medical College and Hospital

of Joysagar Civil Hospital and blood donors of Jorhat Medical College and Hospital respectively, which was comparable to 0.46% found in a study done in Nepal[5]. Our study showed a smaller rate of 0.46% sero positivity was found for HCV at Blood donors of Joysagar Civil Hospital , which was comparable with the study done in Ethiopia by Yohannes *et al.* which was 0.6%[6] and 0.6% by Birhaneselassie[7]. On the other hand, sero prevalence of HCV among donors of Jorhat Medical College was little higher which was 1.05%. This is in correlation to a study done by Francesca Tognan and Steohen Sevalie among donors in Sierra Leone, where seroprevalence of HCV was 1.2%[8]. In our study the sero-prevalence of HIV was 0.20% of the total blood units collected during the study period at Jorhat Medical College and Hospital, which is in correlation to a study done in Southern Haryana by Arora Arora and Khetarpal[9] Whereas, our study show 0.55% sero prevalence of HIV among the donors at Jorhat Medical College and Hospital, which is in correlation to a study done by Pallavi *et al.*[10] which was 0.44%. Syphilis though is a sexually transmitted infection, is also transmitted via blood and blood products. The prevalence rate of syphilis among the collected blood units at Joysagar Civil Hospital was 0.68%. Compared to that, sero prevalence of syphilis among donors of Jorhat Medical College was low, which was 0.22% only, which is in correlation to 0.30% among the donors in Nambia, in a study done by Rooyen Mavenyengwa[11].

At blood Centre of Joysagar Civil Hospital, among all the infection, Syphilis ranked highest (n = 37) followed by HCV (n = 25) and HBV (n = 19) and then HIV (n = 11) which had the least prevalence. On the other hand, among the donors of Jorhat Medical College and Hospital, HCV ranked highest (n = 140) followed by HIV(n = 74) and HBV (n = 54) and the Syphilis (n = 30) which had the last prevalence. Among the female donors, none was tested positive for one or more of the studied infections at both the blood centres.

CONCLUSION

Even though the sero-prevalence of blood borne infection is low among blood donors in Sivasagar a larger study to generate more accurate estimates of the magnitude of the transfusion-transmissible infectious diseases would be needed. A deeper understanding of prevalence and demography of blood borne diseases will help in improvement of clinical selection of blood donors. The findings of our study underscore the necessity for continued vigilance in blood screening and safety protocols. The substantial gender and age disparities in infection rates highlight the need for targeted awareness campaigns and interventions. Hence, this study can provide valuable insights that can aid in the improvement of blood donor selection criteria and the prevention of infections, ultimately ensuring the safety of blood transfusions and the health of donors.

Table 1: Showing gender wise distribution of transfusion transmitted infection at Joysagar Civil Blood Centre between 1st October 2022 to 30th September 2023

Sex	No of donors	% of donors			
Male	5346	99%			
Female	54	1%			
Total	5400	100%			
Sex Tested		HbsAg+ve(%)	HCV+ve(%)	HIV+ve(%)	Syphilis+ve(%)
Male 5346		0.36%	0.46%	0.20%	0.68%
Female 54		0%	0%	0%	0%
Total 5400		0.36%	0.46%	0.20%	0.68%

Table 2: Showing gender wise distribution of blood donors at blood centre of jorhat medical college and hospital

Sex	No of donors	% of donors
Male	13,338	99.5%
Female	67	0.5%
Total	13,405	100%

Table 3: Gender wise distribution of transfusion transmitted infection at blood centre of jorhat medical college and hospital between 1st october 2022 to 30th september 2023

Sex	Tested	HbsAg+ve(%)	HCV+ve(%)	HIV+ve(%)	Syphilis+ve(%)
Male	13.338	0.40%	1.05%	0.55%	0.22%
Female	67	0%	0%	0%	0%
Total	13,405	0.40%	1.05%	0.55%	0.22%

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REFERENCES

1. Mohammed, Y. and A. Bekele, 2016. Seroprevalence of transfusion transmitted infection among blood donors at jijiga blood bank, eastern Ethiopia: Retrospective 4 years study. BMC. Res. Notes., 9: 1-6.
2. W.H.O., 2001. World Health Organization. Blood safety and availability fact sheet.
3. Rao, P., K. and Annapurna, 1994. HIV status of blood donors and patients admitted in KEM hospital, Pune. Ind. J. Hemat. Blood. Transf., 12: 174-176.
4. Rose, D.,A and Sudarsanam, 1998. HIV status of blood donors and patients admitted in KEM hospital, Pune. Ind. J. Med. Res., 108: 42-44.
5. Mavenyengwa, R.T., M . Mukesi, I. Chipare and E. Shoombe, 2014. Prevalence of human immunodeficiency virus, syphilis, hepatitis B and c in blood donations in namibia. BMC. Public. Health., 14: 1-7.
6. Zenebe, Y., W. Mulu, M. Yimer and B. Abera, 2015. Sero-prevalence and risk factors of hepatitis C virus infection among pregnant women in bahir dar city, northwest Ethiopia: Cross sectional study. Pan Afr. Med. J., Vol. 21. 10.11604/pamj.2015.21.158.6367
7. Birhaneselassie, M., 2016. Prevalence of transfusion-transmissible infections in donors to an Ethiopian blood bank between 2009 and 2013 and donation factors that would improve the safety of the blood supply in underdeveloped countries. Lab. Med., 47: 134-139.
8. Tognon, F., S. Sevalie, J. Gassimu, J. Sesay and K. Hann *et al*., 2020. Seroprevalence of hepatitis B and hepatitis C among blood donors in sierra leone: A multi-year retrospective study. Int. J. Infect. Dis., 99: 102-107.
9. Arora, D., B. Arora and A. Khetarpal, 2010. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in southern haryana. Indian J. Pathol. Microbiol., 53: 308-309.
10. Pallavi, P., C.K. Ganesh, K. Jayashree and G.V. Manjunath, 2010. Seroprevalence and trends in transfusion transmitted infections among blood donors in a university hospital blood bank: A 5 year study. Indian. J. Hematol. Blood Transfusion., 27: 1-6.