



EVALUATION OF HEPATITIS B POSITIVE CASES AMONG VOLUNTARY BLOOD DONORS

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ABSTRACT **Introduction-** HBV, HCV, malaria, HIV and syphilis are the most common transfusion-transmitted infections because of prolonged viremia and carrier or latent state. A healthy voluntary blood donor screening procedure, donor selection and proper counseling of the donor will decrease the risk of acquiring TTI. This study was conducted on voluntary blood donors in J.A. Group of Hospital, GRMC Gwalior. Hepatitis B is highly infectious and relatively easy to transmit. **Material and Methods-** After screening of blood donor, we collected the required amount of whole blood in 350/450ml CPD – SAGM (citrate phosphate dextrose – saline adenine glucose mannitol) Blood bag. We took 3ml of anti-coagulated blood from the tubing's of blood bag and it was centrifuged at 1200rpm (Round per min.) for 3-5 min. supernatant plasma was used for testing of transfusion transmitted infection. Sandwich Elisa method was used for testing of HBsAg. Rapid card test method was used for HBV. **Aims and Objectives-** To estimate the prevalence of HBV Infection among voluntary blood donors To determine the age and gender distribution of HBV Infection To identify risk factors associated with HBV Infection. **Results-** Study reveals that the 21-30 years age group constitutes the largest segment, representing 53.9% of the total HBV Positive donors. 99.5% of the donors being male and only 0.5% being female. Which have shown that voluntary blood donation is often dominated by male donors, particularly in developing regions. a significant presence of individuals from lower to middle-income professions. **Conclusion-** Study's identification of risk factors, including age and socioeconomic variables, provides valuable insights for targeted interventions to enhance donor recruitment and ensure the safety of the blood supply.

KEYWORDS : Blood transfusion, Hepatitis B, Transfusion transmitted infections**INTRODUCTION:**

Parenteral administration of blood and blood products, such as Fresh Frozen Plasma (FFP), packed cells, and leucoreduced whole blood, carries a risk of transmitting infectious diseases, including HIV, Hepatitis B, Hepatitis C, malaria, and syphilis. According to WHO around 112 million blood donations happen across the globe annually. 13,000 collection centers collect the 112 million blood donations globally Blood transfusion is a basic necessity. To ensure the safety of the blood transfused, governments of each of the countries have regulatory bodies at all state levels. Blood collection, transport, storage and processing should be coordinated at the national level. There are three kinds of donors who are considered for blood donations. They include voluntary donors, unpaid donors and family donors. The voluntary donors are the best donors. The transmission of various infectious agents with RBCs or platelets has been studied. RBC transfusion is done in acute trauma, cardiac surgery, and in certain cardiovascular diseases. In the USA, transfusion of RBC has been shown to spread Babesia. Sero-prevalence as per NAT diagnosis ranges from 0.4-1.2%. Bacterial contamination is rare in RBC transfer but has been reported. In France, the prevalence of bacterial contamination was 1 in 2.6 million donations. In Germany, it was observed to be 1 in 1.9 million donations [1]. In many of the cases, the bacterial contamination is the major risk. Therefore, an efficient screening needs to be done to confirm safety. Transfusion-transmitted CMV has been observed at a rate of 0.1%. The prevalence of HIV, HBV, and HCV are very low, ranging from 0.0004% to 0.0007%. In addition TTI tests in blood donors are necessary to decrease the chance of transmission of infection and also provide safe blood to the recipient so that there will be reduced mortality and morbidity, not only in patients but also for family, community, society and the general population. Apart from the risk of infection from transfusion, other risks include the adverse effects post-transfusion [2]. HBV, HCV, malaria, HIV and syphilis are the most common transfusion-transmitted infections because of prolonged viremia and carrier or latent state. A healthy voluntary blood donor screening procedure, donor selection and proper counseling of the donor will decrease the risk of acquiring TTI. This study was conducted on voluntary blood donors in J.A. Group of Hospital, GRMC Gwalior. Hepatitis B is highly infectious and relatively easy to transmit and has the highest prevalence among TTI. The Author Zahera Naseri et al (2016) has reported ABO blood group was not associated with HBV or HCV antigen. People of Rh –ve blood group have less chance of HBV. Author Shah RJ et al (2022) had reported that Rh positive and Rh negative individuals have an association with HBV. With the advent of

ELISA based techniques, the incidence of Hepatitis have fallen.

AIMS AND OBJECTIVES:

- To estimate the prevalence of HBV Infection among voluntary blood donors.
- To determine the age and gender distribution of HBV Infection
- To identify risk factors associated with HBV Infection.

MATERIAL AND METHODS:

Sample size calculated using the formula: From the study of Yadav et al [3] Transfusion Transmitted Infections prevalence in the study was reported 1.75. Sample size was 10500 voluntary blood donors in our study.

Inclusion criteria:

- Age 18 - 65 yrs
- Weight above 45kg
- Hb > 12.5 gm/dl.
- BP (Systolic – 120±20 / Diastolic – 80±10)
- Donor should be afebrile, pulse 60-90/min.
- Absence of any illness

Exclusion criteria:

- All Blood donor which are below 18 years of age and above 65 years of age
- Hypertensive
- Anemic
- History of uncontrolled diabetic, hypertension, cardiovascular disease
- bleeding disorder
- asthma
- Weight < 45kg.
- Hb < 12.5 gm %.
- Presence of any illness

Laboratory testing:

After screening of blood donor, we collected the required amount of whole blood in 350/450ml CPD – SAGM (citrate phosphate dextrose – saline adenine glucose mannitol) Blood bag. We took 3ml of anti-coagulated blood from the tubing's of blood bag and it was centrifuged at 1200rpm (Round per min.) for 3-5 min. supernatant plasma was used for testing of transfusion transmitted infection. Sandwich Elisa method was used for testing of HBsAg. Rapid card test method was used for HBV.

RESULTS:

Table: 1 Age group distribution of hepatitis B positive cases

Age group (Yrs)	Number	Percent
18-20	09	4.4%
21-30	110	53.9%
31-40	70	34.3%
41-50	13	6.3%
51-65	02	0.98%
Total	204	100

Table: 2 Gender distributions of hepatitis B positive donors

Gender	Frequency	Percent
Male	203	99.5
Female	01	0.49
Total	204	100

Table: 3 Previous history of blood donation

Previous history of blood donation	Frequency	Percent
Yes	35	17.1
No	169	82.8
Total	204	100

Table: 4 Socioeconomic status of HBV positive voluntary blood donors

SES	Frequency	Percent
Low	159	77.9
Middle – High	45	22.1
Total	204	100

DISCUSSION:

Out of a total of 10,500 voluntary blood donors, 277 individuals were found to have Transfusion Transmitted Infections (TTIs). Out of which 204 cases were Hepatitis B positive, Pallavi et al. [4] also found an overall TTI prevalence of 1.35% among voluntary donors in a university hospital blood bank, with HBV being the most commonly detected infection. Our study reveals that the 21-30 years age group constitutes the largest segment, representing 53.9% of the total HBV Positive donors. This is followed by the 31-40 years age group, which accounts for 34.3%. Younger donors, aged 18-20 years, represent a smaller fraction at 4.4%, this pattern aligns with observations from studies by Allain (2004) [5]. The gender distribution in this study is markedly skewed towards male donors, with 99.5% of the donors being male and only 0.5% being female. Which have shown that voluntary blood donation is often dominated by male donors, particularly in developing regions. The observed male-to female ratio highlights the need for further investigation into the factors influencing female participation in blood donation, including cultural and social norms. This significant gender disparity indicates that men are substantially more likely to volunteer as blood donors in this particular cohort. This finding is consistent with studies by Allain (2004) [5] and Schreiber et al. (2003). [6]

The socioeconomic status of the blood donors in this study reveals a diverse range of occupations, with a notable concentration of labourers and farmers. Other occupations, such as truck drivers, businessmen, mechanics and students, are represented in smaller percentages. This data suggests a broad demographic of blood donors, with a significant presence of individuals from lower to middle-income professions. This mirrors findings by Tagny et al. (2009) [7]

The majority of blood donors in this study (82.7%) have donated blood only once, while smaller proportions (17%) have donated twice, and only a very small percentage (0.4%) has donated three times. This indicates that most donors are first time or infrequent donors, highlighting a potential need for improved donor retention strategies and awareness programs to encourage repeat donations. Studies by Schreiber et al. (2003) [6] also highlight the trend of first-time donors making up the majority of the blood bank. The data indicates that strategies to encourage repeat donations are essential for maintaining a stable blood supply. This study indicates that most donors were first time or infrequent donors, highlighting a potential need for improved donor retention strategies and awareness programs to encourage repeat donations. Studies by Schreiber et al. (2003) [6] also highlight the trend of first-time donors making up the majority of the blood bank. The data indicates that strategies to encourage repeat donations are essential for maintaining a stable blood supply. This finding aligns with the trend observed by Busch (2001) [8] and Schreiber et al. (2003) [6]. The data on previous blood donations reveals that 17.1% of the total donors had a history of donating blood. This highlights the need for targeted interventions to encourage repeat donations, such as educational campaigns and incentives. The majority of the blood

donors (82.8%) had donated blood once; there is a gap in repeat donation behavior, which could be an area for improvement through education and awareness.

These findings suggest that blood donors in this study are predominantly young, male and from lower-income backgrounds. While a majority are first-time donors, the overall rate of transfusion-transmitted infections, especially hepatitis B, indicates a critical need for continued screening and donor education to ensure the safety of the blood supply. The high HbsAg prevalence also aligns with studies by WHO (2010) [9], which highlight the importance of screening for HBsAg, HBV, HCV and HIV in blood donations.

This data suggests a clear trend where younger adults, particularly those in their twenties, are the most active blood donors, with participation decreasing as age increases. This pattern aligns with observations from studies by Allain (2004) [5], who have consistently reported that younger adults are often the primary contributors to blood donation drives. The concentration of donors in the 21-40 age brackets highlights the importance of targeting this demographic in donor recruitment campaigns.

CONCLUSION:

The analysis of donation frequency indicated that most donors were first time or infrequent, showing the need for improved donor retention strategies. The high prevalence of HBsAg, highlighted the importance of rigorous screening protocols, WHO (2010) [9]. The observed gender disparity, with a marked male dominance, warrants further investigation into factors influencing female participation. The study's identification of risk factors, including age and socioeconomic variables, provides valuable insights for targeted interventions to enhance donor recruitment and ensure the safety of the blood supply. Overall, the findings indicate, importance of monitoring, donor education and stringent screening practices to mitigate the risk of TTIs and maintain a safe blood supply in the tertiary care center

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