INTRODUCTION

Hepatitis is a global health burden. Amongst the different serotypes of the hepatitis virus, hepatitis B virus is associated with significant mortality and morbidity.\[1\] Although the prevalence of hepatitis B infection is highest in the Western Pacific Region and Africa, India carries a substantial burden. According to the WHO, 40 million people are chronically infected with hepatitis B in India.\[2\]

The hepatitis B virus belongs to the Hepadnaviridae family of DNA viruses and is made up of several proteins, which are used as markers of active and latent infection. These include Hepatitis B surface antigen (HbsAg), Hepatitis B core antigen (HbcAg), Hepatitis B e antigen (HBeAg), HBV Polymerase (Pol) and Hepatitis B X Protein (HBx). Active replication in the hepatocytes induces a CD 8+ led cytotoxic attack on the infected cells. Subsequently virus specific CD4+ and Interferon – gamma produced by CD8+ cells help in resolution of infection.

Clinically Hepatitis B causes a subclinical or a mild infection in majority of patients. Symptoms maybe nonspecific and range from mild fever to anorexia and jaundice. 10% of individuals progress to chronic infection and this is commonly encountered in babies who acquire infection via vertical transmission.\[3\] The first marker to appear in blood after infection is HbsAg whose titres begin to rise before the elevation of other liver enzymes like transaminase. The first marker to appear in blood after infection is HbsAg whose titres begin to rise before the elevation of other liver enzymes like transaminase.\[3\] The first marker to appear in blood after infection is HbsAg whose titres begin to rise before the elevation of other liver enzymes like transaminase.\[3\] The first marker to appear in blood after infection is HbsAg whose titres begin to rise before the elevation of other liver enzymes like transaminase.

Background: Hepatitis B is a major health problem worldwide, that is commonly transmitted via blood transfusion. India falls in the intermediate endemicity zone of 2-4%. On spot diagnosis of Hepatitis B is difficult in blood banks at the time of voluntary blood transfusion. Materials and Methods: This retrospective study was conducted at the GS Medical college and Hospital blood bank between January 2019 – December 2022. Blood samples from voluntary blood donors was tested for the five important transfusion transmitted infections namely Hepatitis B and C, HIV, Malaria and Syphilis.

Result: A total of 2581 blood samples were tested for transfusion transmitted infections for 3 years which showed 2% positive cases of hepatitis B and a predominance of B positive cases of hepatitis B. Diagnostic accuracy was 100% via the ELISA method of testing. The HbsAg out of which 53 cases (2%) tested positive for the Virus. Conclusion: Blood group B and Rh positive donor were mostly infected by HBV. We concluded that the prevalence of HBV was highest among all other TTI. The ELISA method showed more accuracy than the card method.
coronary artery diseases, vascular diseases and tumorigenesis are seen frequently in certain ABO blood group system. A good example of this is the effect the ABO system has on the half life of vWF. Subjects with O blood group have a significantly shorter half-life of vWF which makes them susceptible to thromboembolism.[1,8,9] Conversely the incidence of hepatocellular carcinoma is low in populations with O blood group.[10] A similar association is also seen with infectious diseases like H. Pylori, HIV etc.[11] ABO antibodies are a component of the innate immune system and play a role in defence against certain bacteria, viruses and parasites. This explains the association between these blood systems and infectious diseases.[11-13]

Many studies have attempted to establish an association between increased prevalence of HBV and its complications among certain blood groups. Siransy et al state that subjects with an “O” Positive blood group are more susceptible to HIV and HBV.[14] On the other hand a study conducted by Satya Prakash et al found that B Rh positive blood group had the highest incidence of HBsAg positivity of 1.09% and accounted for the highest seropositivity among various transfusion transmission infections (2.19%).[15] However, Mohammadali et al state that a lower frequency of HbsAg was seen among blood group O donors.[16] Smuzness et al and Behal et al failed to establish a definite association between blood group subtype and HBV infection.

MATERIALS AND METHODS

This retrospective study was conducted at the GS Medical college and Hospital blood bank between January 2019 – December 2022. Blood samples from voluntary blood donors was tested for the five important transfusion transmitted infections namely Hepatitis B and C, HIV, Malaria and Syphilis.

RESULTS

A total of 2606 healthy donors registered during the study period were included. Out of them, 53 donors (2%) were HBV positive. Among the total positive cases most of them 24 cases(45%) were belongs to B group followed by 13cases (24%) of group A, 11 cases (20%) of group O and 5 cases (9%) of group AB. We have also observed that out of 53 HBV positive cases 47 cases (88%) are Rh positive and remaining 6 cases (11%) are Rh negative.

![Graph 1: Percentage of Positive Cases From 2019-2022](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Positive Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>484</td>
<td>8 / 484</td>
<td>1.6%</td>
</tr>
<tr>
<td>2020</td>
<td>201</td>
<td>2 / 201</td>
<td>0.9%</td>
</tr>
<tr>
<td>2021</td>
<td>720</td>
<td>14 / 720</td>
<td>1.9%</td>
</tr>
<tr>
<td>2022</td>
<td>1176</td>
<td>29 / 1176</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HbsAg Status</th>
<th>A GROUP (t = 13)</th>
<th>B GROUP (t = 24)</th>
<th>AB GROUP (t = 5)</th>
<th>O GROUP (t=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A +ve</td>
<td>A -ve</td>
<td>B +ve</td>
<td>B -ve</td>
</tr>
<tr>
<td>HbsAg Positive</td>
<td>11</td>
<td>2</td>
<td>23</td>
<td>1</td>
</tr>
</tbody>
</table>

DISCUSSION

Each and every blood group system of our body reflects how many type of antigen present on the surface of RBC. Knowing the association between cell surface antigen and different chronic diseases helps to get better treatments. To determine therapeutic strategies, we need to know the association between blood groups antigen and viral infection because there is no medication available to treat acute as well as chronic hepatitis though some patients are targeted with antiviral drugs. Our study was targeting to find out the association between ABO & Rh system with HBV infections. The blood groups have some biological role in case of hepatitis B[16] and having a complicated correlation between blood group and viral infections.[17] In our study, out of a total 2606 donors, 53 (2%) cases were positive for HBs Ag which is similar to Bagiyalakshmi, et al. (2016) and Gupta, et al. (2004)

In our study blood group B Rh (D) positive blood donors had highest percentage (45%) of HBsAg seropositivity. In India blood group distribution has a lot of diversity. Therefore, it is essential to have
knowledge on frequency of ABO blood groups in particular region in determining the course prevalence of TTIIs. Many studies have been done to explore association of ABO and Rh blood group and risk of TTIIs; but the results obtained from such studies are contradictory. This is because such studies have adopted different sample size, different screening methods and different social and geographical factors. Few studies observed higher seroprevalence of HBV, HCV and HIV, among O positive blood group. However, studies with large sample size did not find any statistically significant association between ABO blood groups and hepatitis B, and between ABO blood group and HIV infection.

CONCLUSION

To conclude, the prevalence of Hepatitis-B is high among all Transfusion-transmitted infections. Predominantly B+ve donors were infected. ELISA method shows more reliable results than the Card method and it should be mandatory for voluntary blood donors screening to avoid false negative which is more common in the Card method. Considering the complications, mode of spreading and chronicity of spreading and to carrier and chronicity of disease, increased awareness and prophylactic measures need to be taken at the public level. The risk of spreading Hepatitis B is high but it can be checked by vaccination, education of high-risk group like sex workers, health care providers and voluntary blood donors. The present study was carried out to determine the prevalence of TTI and its association with the ABO and Rh blood group. However, the highest frequency of infected donors was observed in blood group 'B'. High number of HBV infection in blood donor in general population such as donor awareness programmes on blood safety and risk of TTI, improved standards for donor selection criteria, improved serological screening protocols, use of advanced techniques like NAT, universal pathogen reduction system and last but not the least, recommendation of active immunization programme for HBV to all recipients who are on repeated blood transfusion therapy

REFERENCES

2. WHO
3. Robbins
