

## **Prevalence of Hepatitis B & HCV Infection among Blood Donors of an Apex Hospital – A Retrospective Study**

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### **Abstract**

Transmission of blood and blood products is associated with infections like Hepatitis B, Hepatitis C and Human Immunodeficiency Virus. In this retrospective observational study of 22,523 voluntary blood donors at a tertiary care hospital in North Coastal Andhra, total prevalence of Hepatitis B Antigen for the years 2016, 2017 and 2018 were observed to be 2.61 %, 2.97 % and 2.23 % respectively with an average prevalence of 2.6% which is close to the national prevalence of 3%. The average prevalence of Hepatitis C Virus is 0.32 vis a vis the national prevalence of 1 – 1.9%. Both Hepatitis B Antigen and Hepatitis C Virus prevalence was highest in the blood donors of the 21 to 30 year age group with a literacy level of university education. Majority of Hepatitis B Antigen and Hepatitis C Virus seropositive donors are repeat donors. Most of the Hepatitis B Antigen and Hepatitis C Virus seropositive donors belong to the economically weaker section and low socioeconomic groups.

These observations emphasize the need for health education about safe sex, safe blood transfusion practices and vaccination drives among these target groups.

### **Introduction**

Hepatitis B is a significant health problem all over the world and is prevalent in a majority of countries. The countries have been divided into three categories based on disease prevalence, High (prevalence >8%), Intermediate (prevalence 2-7%) & Low (prevalence <2%) (1). India is a region with an intermediate prevalence of Hepatitis B with a carrier rate of 3% and approximately 37 million HBV Carriers (2). The prevalence of Hepatitis C is 1 – 1.9 % in India (3) with almost 12 to 18 million populations being seropositive compared to the global prevalence of 2.8 % (4).

Blood and blood products form a vital component in the management of a broad spectrum of medical conditions. While transfusion of blood and blood products is lifesaving, it is associated with its fair share of complications and transmission of bloodborne pathogens and viruses is one of them. The most common blood and blood product transmission related infections include HCV, Hepatitis B, HIV, and Malaria & Syphilis. Hepatitis B virus is a double stranded DNA virus and infection results from exposure to infected blood or blood

containing products. Routes of transmission include sexual contact, blood transfusions, use/reuse of contaminated needles and syringes and vertical transmission from mother to child. The horizontal mode of transmission has been found to be the predominant route of transmission of the virus. Hepatitis B is 50 – 100 times more infectious than HIV<sup>(5)</sup>. Chronic infection with hepatitis B virus either may be asymptomatic or may be associated with chronic hepatitis, leading to cirrhosis over a period of several years. It also increases the risk of hepatocellular carcinoma.

As Hepatitis B & HCV lead to a wide array of comorbidities and are a burden to society, with this study, we aim to find out the occupation, socio-economic and literacy level of seropositive subjects in order to target efforts for health education and vaccination at the community level. With this background, this study was conducted with the following aims and objectives.

**Aims & Objectives**

- To estimate the prevalence of HbsAg and HCV among blood donors of an apex hospital.
- To know the occupation, socio economic status and level of literacy of HbsAg & HCV seropositive donors, so that can be appropriate interventions can be targeted to such subgroups for health education and vaccination at the community level

**Material Methods**

It is a retrospective observational study conducted on 22,523 voluntary blood donors in an apex hospital in Visakhapatnam for a period of three years from January 2016 to December 2018. All of them were in the age group of 18-65 years. A printed donor form is required to be filled by each voluntary blood donor before donation. The donor form contains questions pertaining to the age, level of literacy, history of prior donations and

occupational history and an informed consent which must be signed prior to donation. Information from this donor form has been used for carrying out this study. All the data was entered and analyzed using Microsoft Excel.

**Demographic data of seropositive donors of Hepatitis B and HCV**

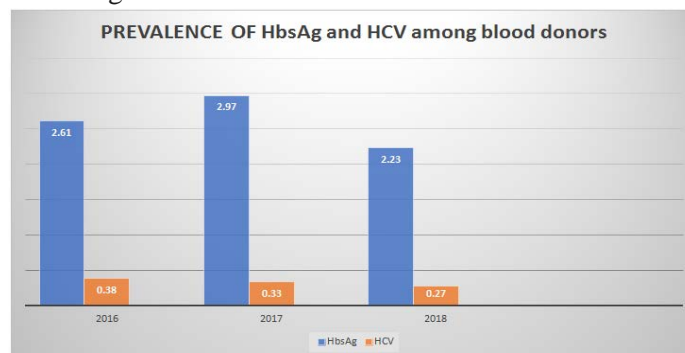
Year	Total	HBSAG (+)	HCV (+)	HBSAG %	HCV %
2016	5706	149	22	2.61 %	0.38 %
2017	8466	252	28	2.97 %	0.33 %
2018	8351	187	23	2.23 %	0.27 %

**Table 1**

The total prevalence of HbsAg for the years 2016, 2017 and 2018 were 2.61%, 2.97% and 2.23 % respectively with an average prevalence of 2.6%. The prevalence of HCV was 0.38%, 0.33% and 0.27% respectively, with the average being 0.32%.

A study conducted in 2011 by Meena et al. regarding the prevalence of HbsAg in blood donors in tertiary hospitals show a prevalence rate of 1.43% for hepatitis B surface antigen (HBsAg) and 0.57% for HCV in North India<sup>(6)</sup>.

A second study done in 2017 by V. Bagiyalakshmi et al. at a tertiary hospital in South India shows the prevalence of HbsAg to be 0.58%<sup>(7)</sup>. When compared to the above studies, the present study showed a higher prevalence rate of HbsAg.



**Figure 1**

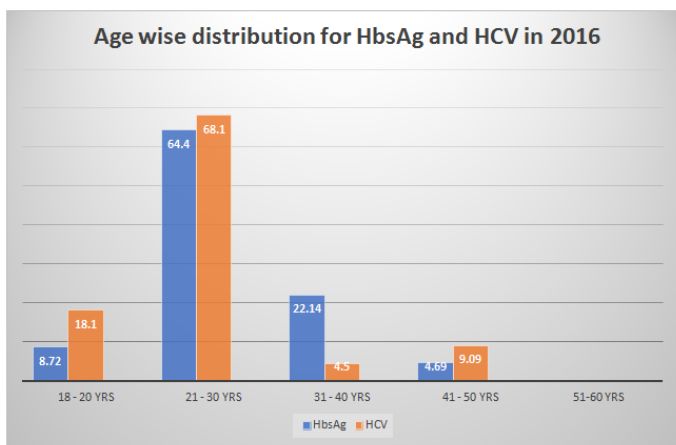


Figure 2

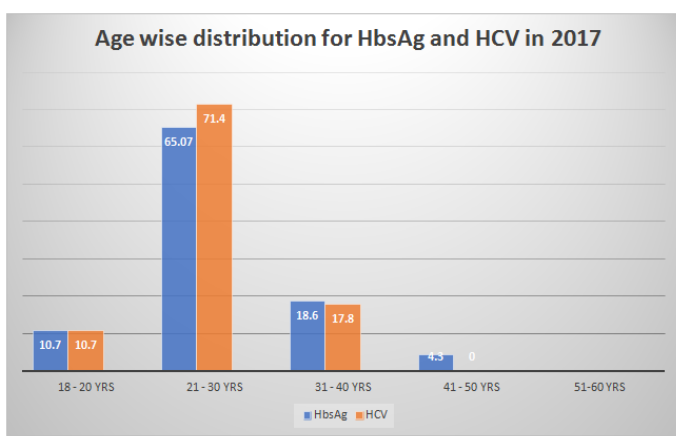


Figure 3

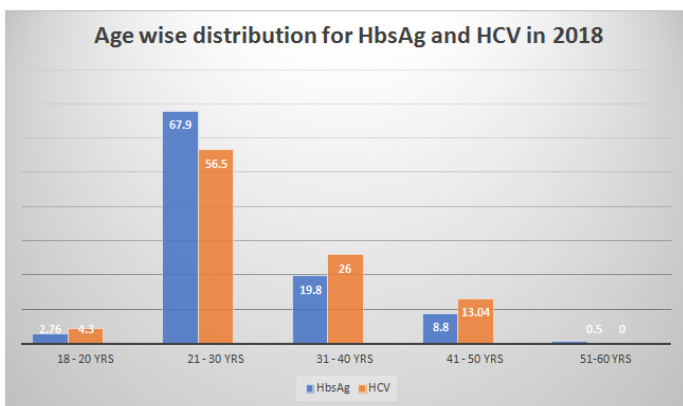


Figure 4

It has been observed that the age group of 21- 30 years has the highest number of HbsAg and HCV seropositive donors. Results showed a prevalence of 64.4%, 65.07% and 67.9% among all the blood donors in the years 2016, 2017 and 2018 respectively while the prevalence of HCV

was 68.1%, 71.4% and 56.5% for the age group of 21 to 30 years. No other studies have been done previously to compare the data.

These results can be attributed to the high volume of blood donors in this particular age group.

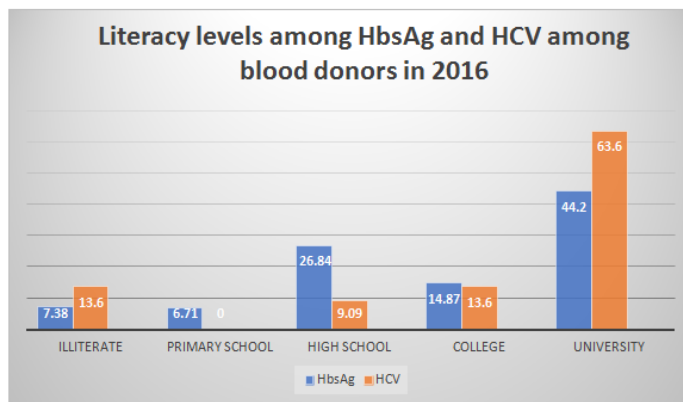


Figure 5

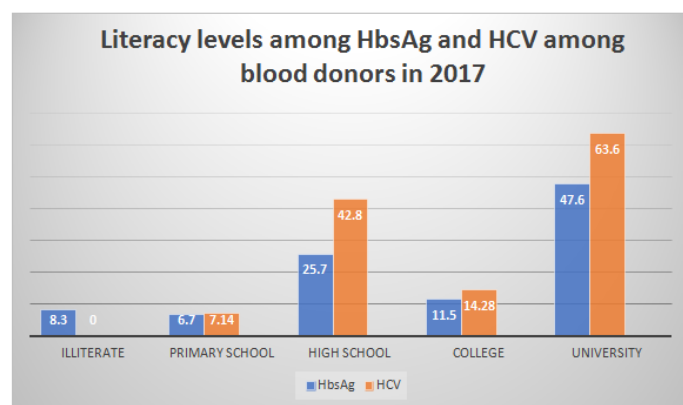


Figure 6

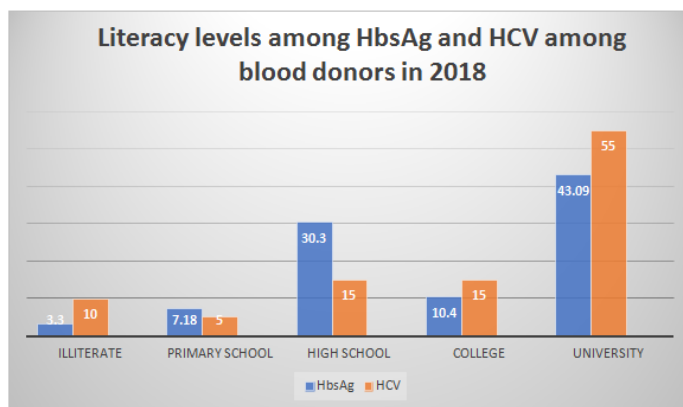


Figure 7

Stratifying the data on the basis of the level of literacy, showed a majority of the seropositive donors were

educated upto the university level with an average of 44.9% of all HbsAg seropositive donors from 2016 to 2018 having a university degree. The majority of HCV seropositive donors ( 51.4%) also had a university-level degree. No other studies have been done to compare the data.

These results indicate that even though the subjects are university educated, better awareness needs to be created regarding the cause of transmission, methods of prevention and vaccination.

Results were also analyzed on the basis of a history of prior donations and the results showed that a majority of HbsAg seropositive donors were repeat donors with an average of 60%. Majority of HCV seropositive donors were also repeat donors with the average being 56.3%. These results stress on the fact that Blood banks must play an active role in providing adequate counselling to seropositive donors to curb repeat donations.

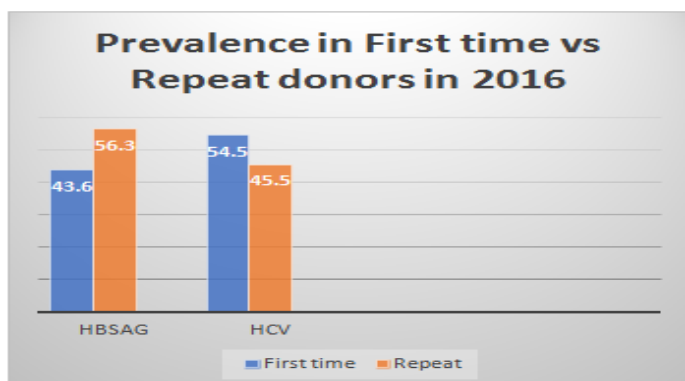


Figure 8

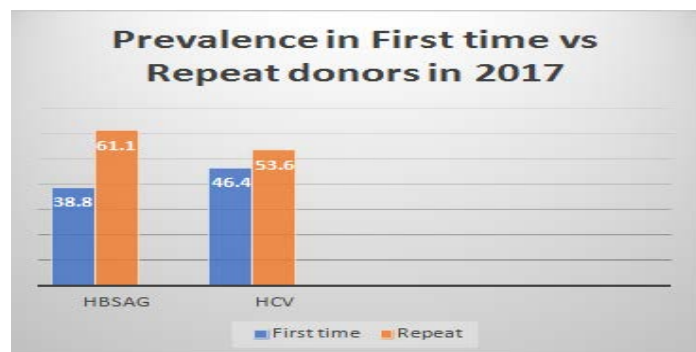


Figure 9

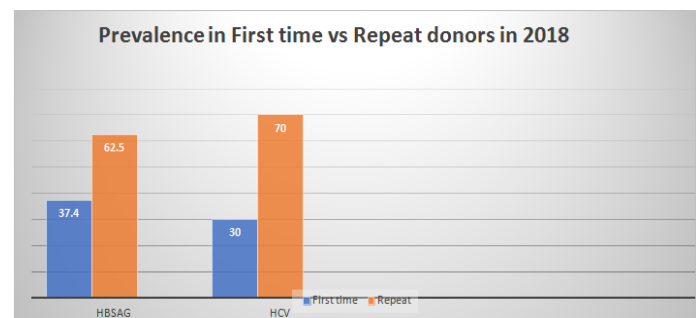


Figure 10

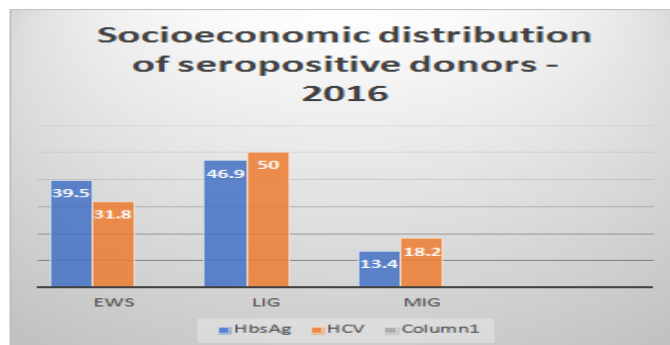


Figure 11

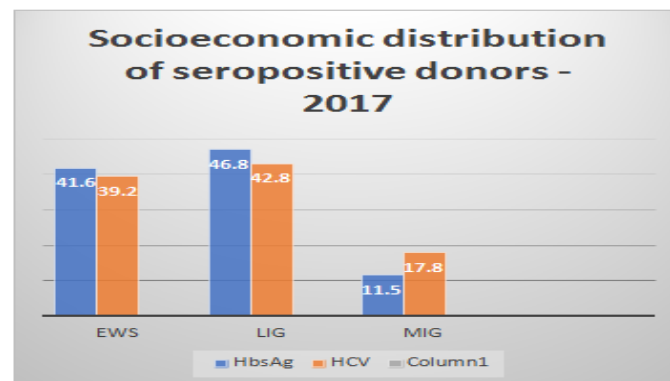


Figure 12

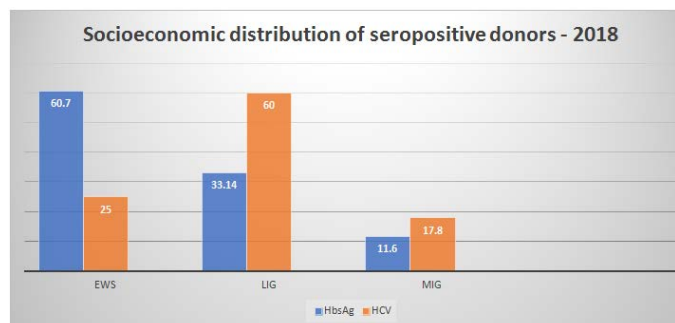


Figure 13

Stratification based on socio-economic status was done into Economically weaker section (Annual income upto

three lakhs ) Low income group (Annual income from 3 to 6 lakhs) Middle income group (Annual income from 6 to 18 lakhs )

The study revealed that a majority of the seropositive donors for HbsAg belong to the economically weaker section (EWS) with 47.2 %. In comparison, the majority of HCV seropositive donors belonged to the Low income group (LIG) with 50.9%. These results show that targeted efforts which include awareness programs about vaccination use and contraception use are needed.

### **Conclusion**

The prevalence of HbsAg and HCV among blood donors in an apex hospital in North coastal Andhra shows an average of 2.60% (2.33% – 2.97%) and hence falls in the intermediate prevalence category, which is slightly below the national average of 3%. However, it is significantly higher than the prevalence found in the studies conducted in North and South India. Prevalence of HCV at 0.32% is lower than the prevalence of 0.58% in North India. Awareness programs need to be conducted to increase the awareness of Hepatitis B and HCV, especially in Schools and colleges as they constitute a significant pool of the seropositive population. Economically weaker sections and lower income groups in the society also need to be targeted with educational programs and vaccination drives to ensure adequate understanding of the health condition & administration of vaccinations. Blood banks must play an active role in providing sufficient counseling to seropositive donors to curb repeat donations. All these measures will ultimately ensure a decrease in the prevalence of HbsAg, HCV and their associated comorbidities.

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