



## SEROPREVALENCE OF HEPATITIS B IN HEALTHY BLOOD DONORS AT BLOOD BANK OF OSMANIA GENERAL HOSPITAL.

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### ABSTRACT

**Background** - With every unit of blood, there is 1% chance of transfusion - associated problems including transfusion - transmitted disease. Hepatitis B infection is one of the transfusion transmissible infections, hence it is mandatory to test all blood donors for HBsAg and other infections like HIV, HCV, syphilis and malaria. Serosurveys are one of the primary methods to determine the prevalence of HBsAg.

**Objective** - The aim of the present study was to know the seroprevalence of hepatitis B among blood donors and to compare the prevalence with other areas in India.

**Materials and methods** - The retrospective study was conducted at the blood bank of Osmania general hospital. In this study blood donation records were reviewed over a period of two years from July 2012 to June 2014.

**Results** - In the present study 6267 donors were reviewed, majority of them were 5948 (95%) males and 319 (5%) females. Majority of the donors belonged to the age group of 18-40 yrs. Seropositivity of HBsAg was higher among other transfusion transmitted diseases.

**Conclusion** - The most complete data providing a picture of hepatitis B disease burden in India come from HBsAg seroprevalence studies. Decreasing trends of seroprevalence of HBsAg can be achieved by increasing the public awareness about the disease and modes of prevention.

**KEYWORDS** : Blood donors, HBsAg, seroprevalence TTIs.

### BACKGROUND

Hepatitis B is a major public health problem worldwide. Approximately 30% of the world's population, or about 2 billion persons, have serological evidence of either current or past infection with hepatitis B virus. Of these, an estimated 350 million have chronic (lasting more than six months, and often for lifetime) HBV infection and at least one million chronically infected persons die each year of chronic liver disease, including cirrhosis and liver cancer (1). Blood transfusion is life-saving but can cause disease if not tested properly for transfusion - transmissible infections (TTIs) before transfusion. Blood transfusion carries the risk of transfusion - transmissible infections, including human immunodeficiency virus (HIV), hepatitis B (HBV), hepatitis C virus (HCV) and syphilis. With every unit of blood, there is 1% chance of transfusion - associated problems including transfusion - transmitted disease (2). HBsAg prevalence rate among blood donors ranged from 1% to 4.7% (1). Countries are classified on the basis of HBV endemicity as having high (8% or more), intermediate (2-7%), or low (less than 2%) depending on the prevalence in general population of hepatitis B carrier state. The prevalence of chronic HBV infection in different studies from India ranges from 2% to 10%, being below 8% in most studies. Therefore, India has intermediate to high endemicity, largely the former, for HBV infection (1). Hepatitis B infection is one of the transfusion transmissible infections, hence it is mandatory to test all blood donors for HBsAg and other infections like HIV, HCV, syphilis and malaria. Serosurveys are one of the primary methods to determine the prevalence of HBsAg.

In 1971, hepatitis B surface antigen test was introduced for screening blood donors to reduce the risk of infectious agent in the blood supply. The aim of the present study was to know the seroprevalence of hepatitis B among blood donors and to compare the prevalence with other areas in India.

### MATERIALS AND METHODS

The retrospective study was conducted at the blood bank of Osmania general hospital. In this study 6267 healthy donors were reviewed over a period of two years from July 2012 to June 2014. Selection of donors was done by physical examination and donor's questionnaire. At the end of the collection donor samples were

obtained for serological HBsAg screening was done using the commercially available HEPALISA kits. HEPALISA is a solid phase enzyme linked immunosorbent assay (ELISA) based on the direct sandwich principle. HEPALISA has a sensitivity of 0.1ng/ml. Best used with fresh samples that have not been frozen and thawed. All reactive samples were tested again using the same HEPALISA KIT. Samples showing repeat test reactivity on both methods were considered positive and were included for calculation of seroprevalence.

### RESULTS

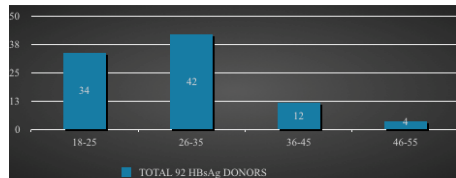
A total of 6267 blood donors were screened for TTIs. Of these majority of them were 5948(95%) males and 319 (5%) females. Table 1. Gives the details of donor category and gender distribution. In the present study majority of the donors belonged to the age group of 18-40 yrs. figure 1. gives the details of the age distribution of the seropositive donors. The incidence of seropositive donors was more in the younger age group (26-35) than older age group (36-45). Prevalence of HBsAg was higher among other transfusion transmitted diseases. The details of seroprevalence of HBsAg among various transfusion - transmitted diseases is given in figure 2. Of total donors screened 157 were seropositive for transfusion transmitted diseases ,92(59%) donors were positive for HBsAg accounting for majority of cases, others disease which were positive are HIV 41(26%), HCV 23 (15%), and syphilis 1(0.06%). Frequency of coinfection among these viruses were negligible. Table 2. gives the details of seroprevalence among various donors. Seroprevalence of hepatitis B is higher in replacement donors. Total seroprevalence of hepatitis account for 1.4%.

Along the study period, there was slight decrease in HBsAg prevalence from 0.5% in 2012 to 0.48% in 2014. Trend of seroprevalence of hepatitis B over two years is given in figure.3.

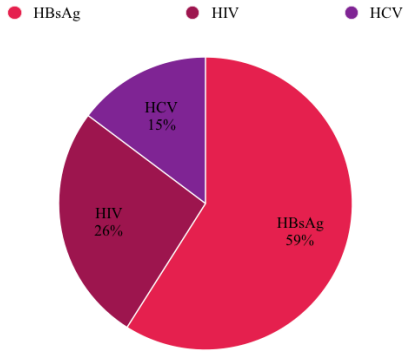
**Table 1. Donor category and Gender distribution**

| DONORS      | MALES      | FEMALES  |
|-------------|------------|----------|
| REPLACEMENT | 2968(47%)  | 57(1%)   |
| VOLUNTARY   | 2980(48%)  | 262 (4%) |
| TOTAL       | 5948 (95%) | 319 (5%) |

**Figure 1. Age distribution of the seropositive donors.**



**FIGURE -2. PREVALENCE OF HEPATITIS B AMONG VARIOUS TRANSFUSION TRANSMITTED DISEASES.**



**Table 2. Seroprevalence among various blood donors**

| DONAR       | POSITIVE | PREVALENCE |
|-------------|----------|------------|
| REPLACEMENT | 50       | 1.65 %     |
| VOLUNTARY   | 42       | 1.3 %      |
| MALES       | 91       | 1.5 %      |
| FEMALES     | 1        | 0.3 %      |

**Figure 3 - TREND OF SEROPREVALENCE OF HEPATITIS B OVER TWO YEARS**



**DISCUSSION**

Blood transfusion is a significant route of transmission of transfusion transmitted infections. Screening of donated blood is important to ensure safe blood transfusion. Blood should be transfused only with proper indication to avoid unnecessary complications including TTIs. According to India's Drug and Cosmetics ACT (1945), each blood unit has to be tested for hepatitis B Virus infection

In the present study, among the 6267 blood donors screened, the overall prevalence of HBsAg was observed to be 1.4%. According to WHO classification, this qualifies as low prevalence area (less than 2%). In comparison with other parts of India, the present study shows low seroprevalence of hepatitis B infections. Table 4. Show the details of comparison of hepatitis B Prevalence in different parts of India

**Table 4. Comparison of hepatitis B prevalence in different parts of India**

| PLACE  | PREVALENCE | REFERENCE     |
|--|------------|---------------|
| BLOOD BANK , OSMANIA GENERAL HOSPITAL, TELENGANA | 1.4 %      | PRESENT STUDY |
| East DELHI Singh et al (2004)                    | 1.8%       | 9             |
| KERALA Mathai J (2002)                           | 1.3 %      | 8             |
| KARNATAKA Singh et al (2009)                     | 0.62%      | 5             |
| JAMMU Suhail et al (2012)                        | 0.51%      | 6             |
| RAJASTHAN Poojaba et al (2014)                   | 1.32%      | 7             |

In the present study seroprevalence of HBsAg in the donor population was found to relatively lower (1.4%) when compared to singh et al (9), east delhi(1.8%),prevalence of present study was close to poojaba et al (7) study Rajasthan ( 1.32%), mathai J (8) study kerala (1.3%). Lower seroprevalence of HBsAg was found in suhail et al (6) study jammu (0.51%) and singh et al (5), studies Karnataka (0.62%).

**Table 5 – seroprevalence of HBsAg in other countries**

| Place                              | Prevalence | Reference |
|------------------------------------|------------|-----------|
| Turkey Emekdas et al (2006)        | 4.19%      | 10        |
| Malaysia Sultan Ayesh et al (2011) | 2.35%      | 11        |
| Egypt Hesham et al (2013)          | 2.3%       | 12        |

The seroprevalence of HBsAg in the present study in lower when compared to emekdas et al, (10) turkey (4.19%), sultan ayesh et al (11) Malaysia (2.35%), hesham et al, (12) Egypt (2.3). The present study revealed that HBV infection was more prevalent among replacement donors than voluntary donors

A significantly higher HBsAg seroprevalence is noted in males than in females. Rodenas et al reported the higher prevalence of HBsAg in donors older than 38 years (4), whereas in the present study, the majority of seropositive donors were younger than 35 years. The major concern in transfusion services today is increased seropositivity among replacement donors for hepatitis B. A slight decreasing trend in seroprevalence for HBV infection was observed in present studies and other studies (5,6,9), Karandeep Singh et al has reported increasing trend in seroprevalence of hepatitis B over last two year period.

**CONCLUSION**

In the present study 6267 donors were screened, 157 donors were seropositive for TTIs. Male donors constituted 95%. The seropositivity of HIV, HBsAg, HCV, and syphilis was 26%, 59%, 15%, and 0.06%.

Although hepatitis B is most common transfusion transmitted disease, the educational programs and the emphasis on the preventive measures are comparatively less while compared to other transfusion transmitted infection like HIV. Decreasing trends of seroprevalence of HBsAg can be achieved by increasing the public awareness about the disease and modes of prevention, Predonation counselling, donor self exclusion and ensuring 100% voluntary blood donation ,Implementation of national strategy for blood safety ,Increase in vaccination programs conducted in the general population and Implementation of nucleic acid amplification testing (NAT) for donor screening.

**REFERENCES**

1. Prevention of hepatitis B in India, An overview. World health organization. New delhi 2002.
2. Widmann FK, editor. Technical manual American association of blood banks. Aglington USA, 1985. P.325-44.
3. Drugs and cosmetic Act 1940 (India).
4. Rodenas JG, Bacasen LC, Que ER.(2006). The prevalence of HBsAg(+) and anti HCV (+) among healthy blood donors at east avenue medical center,Quezon city .phil J of Gastroentology 2:64-70
5. Singh et al – Trend in seroprevalence of Hepatitis B virus infection among blood donors of coastal Karnataka, India. 2009;3(5):376-379.
6. A study of seroprevalence of hepatitis B at a tertiary care hospital Jammu. Suhail malik senior resident, prsharma, urmilk antaverma, Associate professor,bbsharma professor & Head: Department ASCOMS Jammu Man College, Bemina, Srinagar JK-Practitioner 2012;17(1-3): 10-12.
7. Trend in seroprevalence of hepatitis b virus infection among blood donors at a tertiary care centre of rajasthan, India Poojaba Jadeja1, Ashmeet Kaur1, Himanshu Shekha1 1Resident, Department of Pathology, Geetanjali Medical College and Hospital, Udaipur, Rajasthan (2014).
8. Mathai j, Sulochana PV,Satyabhama S, Nair PK(2002) Profile of transfusion transmissible infection and associated risk factors among blood donors of kerala. Indian J pathol Microbiol;45:319-322.
9. Singh B, kataria SP,Gupta R.(2004) infectious marker in blood donors of east Delhi: prevalence and trends. Indain J Pathol Microbiol.47: 477-479.
10. European Journal of Epidemiology April 2006, Volume 21, Issue 4, pp 299–305 | Trends in Hepatitis B and Hepatitis C Virus among Blood Donors over 16 Years in Turkey Emekdas gurolcavuslu sabanoncu Oral.
11. Frequencies of HBV, HCV, HIV, and Syphilis Markers Among Blood Donors: A Hospital-Based Study in Hodeidah, Yemen Sultan Ayesh Mohammed Saghir, Faisal Muti Al-Hassan, Omar Saeed Ali Alsalahi, Abdullah Ebrahim Abdul-Alaziz Alhariry and

- Huda Salman Baqir Advanced Medical and Dental Institute, Universiti Sains Malaysia, Penang, Malaysia, Blood Bank Unit, Military Hospital, Hodeidah, Yemen (2012).
12. Seroprevalence of HBV, HCV, HIV and Syphilis Markers among Blood Donors at Suez Canal University Hospital Blood Bank Hesham A Nada\* and Mona Atwa Dermatology and Andrology Department, Faculty of Medicine, Suez Canal University, Egypt 2013.
  13. Mollison's blood transfusion in clinical medicine. 11th edition Harvey G kelvin.
  14. Textbook of transfusion medicine. 3rd edition. Jeffrey McCullough. S.