

Original research article

## Seroprevalence of Australia Antigen (HBsAg) Among Blood Donors Coming to Sir. T. Hospital, Bhavnagar, Gujarat.

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### Abstract

**Introduction:** Transfusion of Blood & Blood Components is one of the four recognized modes of Hepatitis B virus infection and HBsAg or Australia Antigen in the serum is the earliest marker of active HBV infection (acute/chronic) being detectable even before elimination of transaminases and onset of clinical illness. Various strategies are being used to reduce this transfusion transmitted infection

**Material and methods:** The retrospective study was conducted on apparently healthy blood donors over a period of 2 years from January,2020 to December,2021 at Blood Bank, Department of Pathology, Sir. T. Hospital, Bhavnagar in order to assess the prevalence of hepatitis B virus infection. A total number of 34,555 blood donors were included in this study. HBsAg ELISA test were used for this study purpose.

**Results:** Out of 34555 donors,12476 (36.104%) were in-house donors and 22079 (63.89%) were outdoor-camp donors. Out of 34555 donors 33403 (96.66 %) were male donors and 1152 (3.33%) were female donors. Out of 34555 blood units, 4096(11.8%) were discarded and out of them 188 (0.54%) were HBsAg reactive. The Seroprevalence of HBsAg was found to be 0.54%.

**Conclusion:** Blood Donors are often found to be reactive for Australia Antigen and others. In order to reduce this Seroprevalence, more sensitive screening assays and appropriate donor selection are must.

**Keyword:** Seroprevalence, Australia Antigen, Hepatitis B surface antigen.

### Introduction

Hepatitis B virus (HBV) infection is a global threat to human health, especially in developing countries with high prevalence. Individuals with detectable surface antigen at six months interval (HBsAg) are considered carriers of HBV chronic infection. HBsAg is the surface antigen of the hepatitis B virus (HBV). It indicates current hepatitis B infection [1]. It is commonly referred to as the Australia Antigen because it was first isolated by the American research physician and Nobel Prize winner Baruch S. Blumberg in the serum of an Australian Aboriginal person [2]. Infection with the hepatitis B virus (HBV) accounts for a significant

portion of morbidity and mortality worldwide [3]. Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. The virus is transmitted through contact with the blood or other body fluids of an infected person [4]. Globally, more than 780 000 people die every year due to the acute or chronic consequences of hepatitis B [5]. Based on the prevalence of hepatitis B carrier state in the general population, countries are classified as having high (8% or more), intermediate (2-7%), or low (less than 2%) HBV endemicity. India is at the intermediate endemic level of hepatitis B [5]. Hepatitis B is a major health problem in India. India with a population of more than 1.25 billion has more than 37 million HBV carriers and contributes a large proportion of this HBV burden. [6]. Estimates indicate that annually over 100,000 Indians die due to illnesses related to HBV infection. HBV is reported to be responsible for 70% of chronic hepatitis cases and 80% of cirrhosis of liver cases [7]. Many cases of HBV infections in adult populations were found to be associated with blood transfusions as HBV is infective through blood and body-fluid, including vertical transmission [8]. Hepatitis B infection is one of the transfusion transmissible infections; hence it is mandatory to test all blood donors for HBsAg. Serosurveys are one of the primary methods to determine the prevalence of HBsAg. The assessment of the occurrence of infections in the blood donor population is made on the basis of the evaluation of the data on the prevalence of hepatitis B infection. Consequently, the assessment helps in determining the safety of the blood products. It also gives an idea of the epidemiology of these diseases in the community. In the present retrospective study, we evaluated the seroprevalence of hepatitis B virus among blood donors.

**Objective:** To determine the Seroprevalence of HBsAg among blood donors in Sir.T.Hospital, Bhavnagar (Gujarat) and to compare it with that of other regions in India.

### **Material and Method**

The Retrospective study study was conducted on apparently healthy blood donors over a period of 2 years from January-2020 to December-2021 at Blood Bank, Department of Pathology, Sir. T. Hospital, Bhavnagar in order to assess the prevalence of hepatitis B virus infection. HBsAg ELISA test were used for this study purpose. Data has been collected from previous blood bank records .Donors were carefully selected for donation after satisfactorily answering the donors' questionnaire and fitness of donor for donation and the physical examination conducted by the physician-in charge. All the collected blood units were screened for Hepatitis B surface antigen or Australia Antigen using different testing methods namely HBsAg ELISA test for qualitative detection (screening) of HBsAg in serum/plasma.

**Inclusion Criteria:** Clinically and Apparently healthy individuals between 18 and 65 years of age and having body weight > 45kg & Hemoglobin level  $\geq$  12.5 g/dl with no significant history of any medical or surgical illness were qualified for the Donation Process.

**Exclusion Criteria:** Persons belonging to high risk groups such as patients with chronic diseases, professional blood donors, drug abusers, dialysis patients, pregnant ladies, patients treated in Sickle cell and Thalassemia clinics, patients treated in Sexually Transmitted Disease clinics and sex workers were excluded from the process of blood donation and also from this present study.

Data was analysed and tabulated in frequency and percentage.

### **Results**

A total number of 34555 blood donors were screened over a period of 2 years from January 2020 to December 2021. Out of them,12476 (36.104%) were in-house donors and 22079 (63.89%) were outdoor-camp donors. Out of 34555 donors 33403 (96.66 %) were male donors

and 1152(3.33%) were female donors. Table no. 1 shows year wise percentage of Outdoor-camp donors and In-house donors. Table no. 2 shows year wise percentage of Male donors and Female donors .

<b>Table 1: Shows year wise percentage of Outdoor-camp donors and In-house donors.</b>					
Year	Total No. of Donors	No. of in House Donors	Percentage of in House Donors	No. of Outdoor camp Donors	Percentage of Outdoor-camp Donors
Jan-Dec-2020	16921	5478	32.37 %	11443	67.626 %
Jan-Dec-2021	17634	6998	39.684 %	10636	60.315 %
Total	34555	12476	36.104 %	22079	63.89 %

<b>Table 2: Male and Female donors year wise</b>					
Year	Total No. of Donors	No. of Male Donors	Percentage of Male Donors	No. of Female Donors	Percentage of Female Donors
January-december2020	16921	16433	97.116 %	488	2.883%
January-december-2021	17634	16970	96.234 %	664	3.765%
Total	34555	33403	96.666 %	1152	3.333%

Table no.3 shows year wise percentage of Discarded Blood units and HBsAg reactive units .Out of 34555 blood units collected, 4096 (11.8%) units were discarded and out of them, 188 (0.54%) units were HBsAg Reactive. The prevalence of Seropositivity for HBsAg was found to be 0.54 % . Table no. 3 shows 9.17% of blood units discarded due to HBsAg reactivity during 2020-2021.

<b>Table 3: Year wise percentages of Discarded Blood Units and HBsAg reactive Units,(9.17%) of Blood units discarded and year wise incidence of HBSAg during 1,Jan-2020 to 31 Dec,2021.</b>						
Year	Total No. of Donors	Total No. of Bags Discarded	Percentage of Bags Discarded (%)	Total No. of HBsAg Reactive Units	Percentage of HBsAg Reactive Units(%)	Percentage of Blood units discarded due to HBsAg Reactivity(%)
Jan-Dec 2020	16921	2111	12.4756 %	98	0.579 %	4.6423 %
Jan-Dec 2021	17634	1985	11.256 %	90	0.510 %	4.5340 %
Total	34555	4096	11.853 %	188	0.544 %	9.1763 %

### Discussion

Liver is the metabolic factory of our body [9] that performs most of the metabolic and synthetic functions including neutralization and removal of xenobiotic compound [10-12] and drugs. [13-15] If this vital organ will damage by any cause it can leads to development of different

reflecting syndrome of major diseases. [16] One of the leading causes of damage this organ is HBV infection that can develop diseases like liver cirrhosis, Hepatocellular Carcinoma and antiviral therapy can only reduces the risk of this disease. [17,18] Among the 34555 screened samples, 188 of them (0.54%) were found positive for HBsAg. Similar type of results was found in an Indian study during the year 2008 [19], year 2015 [20], and year 2018[21]. In contrast, seropositivity in another study was observed to be as low as 1.55% in 1996 and 0.99% in 2002 [22]. A community cluster survey on STD prevalence conducted in Tamil Nadu showed an HBsAg prevalence rate of about 5.7% [23]. In our study, the overall Seroprevalence of HBsAg was observed to be 0.54%. According to the WHO classification, this part of the Gujarat qualifies as a low prevalence area (less than 2%). The data providing a picture of hepatitis B infection burden in India has come from HBsAg Seroprevalence studies. Comparison with the other parts of India, the present study shows low Seroprevalence of hepatitis B infection in Gujarat. On comparison of the trends of hepatitis B positive among blood donors in 2020, 2021. Positive cases of 0.57 and 0.51% was noted. Rural population with lower literacy rate and a lack of about the disease and its mode of prevention may be the reason for or increased incidence. However, screening of blood bank donors for HBsAg does not totally eliminate the risk of HBV infection through blood transfusion. Since, the absence of this marker in the serum does not exclude the presence of HBV infection, who lacked detectable HBsAg but whose exposure to HBV infection was indicated by a positive anti-HBc and HBV DNA, are a potential sources of HBV infection [24] The prevalence of this infection varies across the different geographical regions. Noting the trend of seroprevalence of hepatitis B is useful to assist the preventive strategies. The aim of this study was to determine the trend of seroprevalence of Hepatitis-B in Sir.T.Hospital, Bhavnagar. Comparison of Seroprevalence of HBsAg among Blood Donors in different other studies.

<b>Name of Study</b>	<b>Year</b>	<b>Place</b>	<b>Seroprevalence</b>
Srikrishna et al [27]	1999	Bangalore	1.86%
Chhattoraj et al [28]	2008	Pune	0.99%
Karandeepsinh et al [29]	2009	Costal Karnataka	0.62%
Gagandeep Kaur et al [30]	2010	Chandigarh	0.65%
S Gulia et al [31]	2011	Vizianagaram	2.48%
Poojaba Jadeja et al [32]	2011	Udaipur, Rajasthan	1.32%
Gujarat,Junagadh [33]	2018	Junagadh, Gujarat	0.59%
<b>Present study</b>	<b>2020-2021</b>	<b>Bhavnagar</b>	<b>0.54%</b>

The population based data on the prevalence of HBV presented here is likely to improve our understanding in disease transmission. Availability of safe blood for the recipients and as well as for community is the responsibility of national transfusion services of that country and it can be achieved by vigorous and cautious screening of donors / or donated blood with laboratory screening tests. Despite of the fact that effective vaccines have been available since the 80s and vaccination has proved to confer lifelong protection against hepatitis B and was highly successful in reducing the disease burden [25] even the HbsAg prevalence in India is still high and this is because of the fact that hepatitis B vaccination is not a part of our National Immunization Programme in India [26].

## Conclusion

Blood donors represent apparently healthy population of a particular geographical region. Occasionally out of them, some people are found to be reactive for Australia Antigen and many other similar antigens as well as antibodies. So to reduce Seroprevalence of HBsAg, more sensitive screening assays and proper donor selection are must. With the implementation of strict selection criteria of donor as per the guidelines laid down for blood banks in the gazette notification by the Government of India and use of sensitive laboratory screening tests, it is possible to decrease the incidence of seropositivity of transfusion transmitted infections and improve the blood product safety. This study provides a helpful guide in reducing the residual risk of transfusion transmitted hepatitis .

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