

Original article

Seroprevalence of Hepatitis B virus infection among blood donors in Shia Muslims in a population of Lucknow

Ahmed S¹, Chaturvedi H², Mehdi SR³

Abstract

Background: The objective of this study was to determine the prevalence and trends in hepatitis B infection among blood donors Shia Muslims attending the blood bank in Era's Lucknow Medical College Lucknow. A retrospective study was carried out by reviewing the results of HBsAg among blood donors for the years 2002 to 2012. During this period, 11962 blood donors were studied. **Conclusion:** There is a constant need to improve public awareness programs to lower the incidence of hepatitis B infection in the general population and in Shia Muslims and consequently first time blood donors. Future studies are also required to determine the trends and outcomes of these programs.

Key Words: HBsAg, seroprevalence, blood donors, Shia Muslims.

Introduction

Hepatitis B virus (HBV) infection is a major health problem in many countries of the world, especially those in Asia, the Middle East, and Africa¹. It is a major cause of chronic liver diseases, particularly cirrhosis and hepatocellular carcinoma. Although the incidence of HBV infection has markedly reduced following mass HB vaccination programs, the average prevalence of chronic HBV infection worldwide is still on the rise. Countries are classified on the basis of endemicity of hepatitis B virus (HBV) infection into high (8% or more), intermediate (2-7%) or low (less than 2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2% to 10% as shown by different studies². India therefore comes under the intermediate to high endemicity category. Hepatitis B infection is one of the transfusion transmissible infections; hence it is mandatory to test all blood donors for HBsAg. Sero-surveys are one of the primary methods to determine the prevalence of HBsAg. In the present retrospective study, we evaluated the seroprevalence of hepatitis B virus among blood donors in Shia Muslim in a population in Lucknow. The study also aimed to determine the trend in hepatitis B infection and to compare the prevalence with that of other areas in India. The results of these prevalence studies should help in the creation of long-term strategies

to improve public health and to prevent spreading of the disease in the local population.

Material And Methods

The study was conducted at the blood bank of a tertiary care hospital serving predominantly Shia Muslim population of Lucknow. In this retrospective study we reviewed 11962 healthy blood donors over a period of ten years from July 2002 to July 2012. They were carefully selected for donation by trained personnel after a complete physical examination and satisfactorily answering the donor's questionnaire. The family members, friends or relatives of the patients were categorized as replacement donors. People who donate blood without expecting any favor in return or in voluntary blood donation camps were classified as voluntary blood donors. At the end of the blood collection, donor samples were obtained for serological testing. HbsAg screening was done using the commercially available Erba Lisa ELISA kit (Transasia Bio-Medicals Ltd, Daman) with reported sensitivity of 100% and specificity of 99.9% per the manufacturer's manual. All reactive samples were tested again using the same ELISA kit as well as a rapid test kit based on the principle of a one-step immunoassay (Hepacard, Biomed Industries, India). Samples showing repeat test reactivity on both methods were considered posi-

1. Sharique Ahmed, Blood Bank, Era's Lucknow Medical College & Hospital Lucknow-226003.
2. Himanshu Chaturvedi, Blood Bank, Era's Lucknow Medical College & Hospital Lucknow-226003.
3. Syed Riaz Mehdi, Blood Bank, Era's Lucknow Medical College & Hospital Lucknow-226003.

Corresponds to: Dr. Sharique Ahmed, Blood Bank, Era's Lucknow Medical College & Hospital Lucknow-226003, **E-mail:** diagopath@gmail.com.

tive and were included for calculation of seroprevalence. The results are presented in percentages. The chi-square statistics was used to compare the prevalence. The odds ratio (OR) with its 95% confidence interval (CI) is also calculated to find out the risk between replacement and voluntary donors. The p-value <0.05 is being considered significant. The analysis was carried out by using EPI-INFO windows version.

Ethical approval was taken from the ethical committee of this hospital.

Results

Out of the total 11962 blood donors, the shia muslim donors were 2805 out of which replacement donors were 2290(81.63%) & voluntary were 515 (18.37) as shown in table I . the initial screening test revealed that 49 shia muslim donors were HBV reactive. On repeat testing only 48 samples were positive as shown in table 1. The majority of the seropositive donors were younger than 45 years (36 donors were 45 years of age or less, and 12 donors above 45 years). The observed sero-

prevalence of HBV was higher in replacement donors than in voluntary donors (1.97% vs. 0.58%, respectively, p=0.03, Table I). The trend in seroprevalence among shia muslim donors over 10 years is shown in figure I.

In this study the seropositivity of HBV among total 11962 donors was found to be 0.95 %(table II) , incidentally the seropositivity among shia muslim donors was found to be higher at 1.71%(distribution given in table III).

Table I: Seropositivity in total donors and shia muslim donors (18 - 60 years)

	Total donors	Total +ve	% +ve
Replacement	9424	88	0.93
Voluntary	2538	26	1.02
RR (95%CI)=0.68 (0.59-1.41), p=0.68			
Shia muslims			
	Total donors	Total +ve	% +ve
Replacement	2290	45	1.97
Voluntary	515	3	0.58
RR (95%CI)=3.37 (1.05-10.81), p=0.03 (Significant)			

Table II: Total donor category with gender distribution (18 - 60 years)

Year	No.of donors		Positive		M% +ve	F% +ve	Total no. of donor	Total +ve	% +ve	OR (Chi-square for trend)
	M	F	M	F						
2002	108	22	1	0	0.93	0.00	130	1	0.77	1.00
2003	274	36	2	0	0.73	0.00	310	2	0.65	0.84
2004	592	50	7	1	1.18	2.00	642	8	1.25	1.63
2005	748	62	5	0	0.67	0.00	810	5	0.62	0.80
2006	932	78	8	2	0.86	2.56	1010	10	0.99	1.29
2007	1072	95	14	0	1.31	0.00	1167	14	1.20	1.57
2008	924	87	8	4	0.87	4.60	1011	12	1.19	1.55
2009	1165	110	7	1	0.60	0.91	1275	8	0.63	0.81
2010	2105	182	18	6	0.86	3.30	2287	24	1.05	1.37
2011	1816	174	14	3	0.77	1.72	1990	17	0.85	1.11
2012	1193	137	9	4	0.75	2.92	1330	13	0.98	1.27
TOTAL	10929	1033	93	21	0.85	2.03	11962	114	0.95	

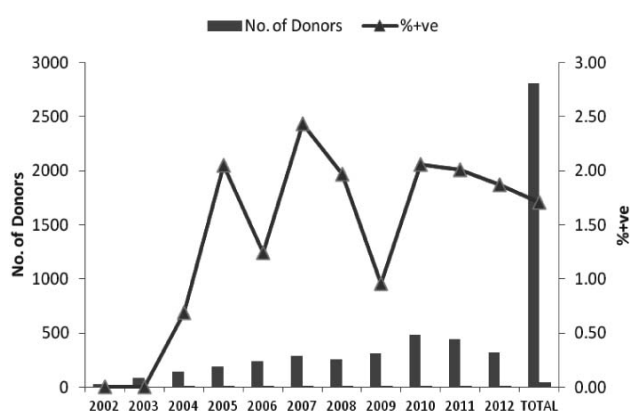
Chi-square for trend=0.002, p=0.97 (insignificant)

Table III: Shia muslim donor category and gender distribution (18 -60 year)

Year	shia muslims		Positive		M% + ve	F% + ve	Total donors	Total + ve	% + ve	OR (Chi-square for trend)
	M	F	M	F						
2002	30	2	0	0	0.00	0.00	32	0	0.00	NA
2003	78	6	0	0	0.00	0.00	84	0	0.00	NA
2004	140	5	1	0	0.71	20.00	145	1	0.69	1.00
2005	185	10	2	2	1.08	20.00	195	4	2.05	3.02
2006	230	12	3	0	1.30	25.00	242	3	1.24	1.81
2007	265	23	6	1	2.26	26.09	288	7	2.43	3.59
2008	232	22	5	0	2.16	22.73	254	5	1.97	2.89
2009	290	22	3	0	1.03	13.64	312	3	0.96	1.40
2010	451	34	10	0	2.22	29.41	485	10	2.06	3.03
2011	409	38	7	2	1.71	18.42	447	9	2.01	2.96
2012	293	28	5	1	1.71	17.86	321	6	1.87	2.74
TOTAL	2603	202	42	6	1.61	20.79	2805	48	1.71	

Chi-square for trend=0.36, p=0.55

Fig.1: Prevalence of HbsAg among Shia Donors



Discussion

According to India's Drugs and Cosmetics Act (1945), each blood unit has to be tested for hepatitis B virus infection³. In our study, among the blood donors screened, the overall seroprevalence of HBsAg was observed to be ----According to the WHO classification, qualifies as a low prevalence area (less than 2%). In comparison with the other parts of India, the present study shows low seroprevalence of hepatitis B infection in lucknow. The present study revealed that the seroprevalence of HBV infection was more in shia muslim donors as compared to the total donors and was significantly high in replacement donors

as compared to voluntary donors as noted in the study of sonwane et. Al. and singhvi et al. A significantly higher HBsAg seroprevalence in males

than in females is also reported in other studies^{4,5}. Rodenas et al⁶. reported the higher prevalence of HBsAg in donors older than 38 years, in current study similar results were observed.

The awareness about the disease and modes of prevention may be one reason for the low prevalence and declining trend in HBV infection. Secondly, the implementation of strict pre-donation counseling and donor selection criteria help in excluding the possibly infected donors. The limitation of our study lies with the fact that we have only screened those donors of who have donated blood as replacement or voluntary donors & have included only a particular sect of population in lucknow. Ensuring the safety of patients by reducing the residual risk of transfusion transmitted hepatitis is the concern of every transfusion center. Along with advanced technology such as nucleic acid testing (NAT) for donor screening, other factors such as public awareness, educational and motivational programs, and mass immunization programs help in decreasing the infection. Pre-donation counseling, donor self-exclusion and ensuring 100% voluntary blood donation will be effective in decreasing the hepatitis B infection rate. This study provides a helpful guide in reducing the residual risk of transfusion transmitted hepatitis not only in lucknow but also in the other cities of India.

REFERENCES

1. Andre F. HBV Epidemiology in Asia, the Middle East and Africa. *Vaccine* 2000;18:20-2. [http://dx.doi.org/10.1016/S0264-410X\(99\)00456-9](http://dx.doi.org/10.1016/S0264-410X(99)00456-9)
 2. Prevention of hepatitis B in India, An overview. World Health Organization. New Delhi 2002.
 3. Drugs and Cosmetics Act 1940 (India).
 4. Sonwane BR, Birare SD, Kulkarni PV. Prevalence of seroreactivity among blood donors in rural population. *Indian J of Med Sci* 2003; 57: 405-407 PMID:14515031
 5. Singhvi A, Pulimood RB, John TJ, Babu PG, Samuel BU, Padankatti T, Carman RH. The prevalence of markers for hepatitis B and human immunodeficiency viruses, malarial parasites and microfilaria in blood donors in a large hospital in south India. *J Trop Med Hyg*; 93: 178-82. PMID:2348495
 6. 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 Gastroenterology*; 2: 64-70.
-