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Original Research Article

To Analyse the Prevalence of Hepatitis B & Hepatitis C in Blood Donors at Tertiary Health Care Centre

Dr. Pulkit Bist[1], Dr. Arun Saxena[2*], Dr. Prachi Mehta[1]
[1]PG Resident, Department of Pathology, Index Medical College Hospital & Research Centre, Indore, Madhya Pradesh, India
[2]Professor, Department of Pathology, Index Medical College Hospital & Research Centre, Indore, Madhya Pradesh, India

***Corresponding author:** Dr. Arun Saxena
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Abstract

Background: The study titled ―A cross-sectional analysis of Seropositivity of Hepatitis B & Hepatitis C amongst blood volunteer donors at tertiary health care centre: 10 year study. ***Method:*** Records of blood donors collected in the past decade were evaluated and information regarding screening tests was being noted. In addition, a questionnaire was being prepared to collected information about all subjects such as general profile, history of exposure to risky procedures or behaviours, family history of Hepatitis B infection, immunization against Hepatitis B in three doses etc. ***Result:*** The above table shows distribution of donors according to type of donor. 54028 (90.81%) donors were Replacement Donors while only 5467 (9.19%) donors were Voluntary Donors. Out of the total 59495 donors in past 10 years, 1020 (1.71%) were diagnosed to be HBsAg positive. Out of the total 59495 donors in past 10 years, 475 (0.79%) were diagnosed to be HCV positive. 74 (1.35%) of voluntary donors in last 10 years came out to be Hepatitis B positive. 58 (1.06%) of voluntary donors in last 10 years came out to be Hepatitis C positive. The above table shows the year-wise number of total donors and voluntary donors. It also shows the number of HBsAg. As per the above tables, there was significantly higher seropositivity among replacement donors as compared to voluntary donors. ***Conclusion:*** A large proportion of HBsAg and HCV infected individuals are not aware of their infective status. It is not only dangerous to not know this as these infections are also sexually transmitted to the spouse or any other sexual partners of such individuals. Also, at the time of emergency for the need of blood, such individuals may be a false assurance of source of blood until being tested and refused by the blood bank before actual donation. This may aggravate the situation by rendering in need to search for another source of blood. An increased public health education on the subject is necessary especially for those at a higher risk. Also, voluntary blood donation should be encouraged to fetch safe and tested blood in contrast to the replacement donation where transfusion-transmitted infections tend to be much higher.

Keywords: Prevalence, Hepatits B, Hepatitis C, Blood.
Study Designed: Observational Study.

INTRODUCTION

Human blood is an essential element of the human life and there are no substitutes for it [1]. The ability to donate and transfuse blood is one of the greatest virtues given to the humans by Mother Nature [2]. Approximately 30 million units of blood components are transfused every year throughout the world [3]. The reasons for blood transfusion are varied but the need for it is ever growing [4] owing to the advancements in the field of medicine and surgery.

Over the last three decades, the source of blood has shifted dramatically from imported blood to locally recruited blood donors [5]. Currently, the sources of donated blood are involuntary donors (as a replacement for their relative's and friend's needs), voluntary unpaid donors, and paid donors. In developed countries, a variety of safety measures ensures a low risk of transfusion-transmitted infections.

Hepatitis B virus (HBV), hepatitis C virus (HCV), Human immune deficiency virus (HIV) and syphilis are the most important lethal agents in transfusion transmitted infections (TTIs) and it remains a large health care burden globally. The present study is an attempt to find out the prevalence of seropositivity of Hepatitis B & Hepatitis C among blood donors at a tertiary care centre in central India.

MATERIALS & METHODS

- **Study Design:** Retrospective observational study

- **Study Area:** Index Medical College, Hospital & Research Centre, Indore.
- **Study Population:** Donors who had donated blood in the past decade.
- **Study Duration:** (Retrospective study from July 2008 to June 2018)
- **Sample Size:** Records of all 59495 blood donors from last 10 years
- **Data Collection:** The data was being collected as per the standard blood donation format of the blood bank.

Methodology

Records of blood donors collected in the past decade were evaluated and information regarding screening tests was being noted. In addition, a questionnaire was being prepared to collected information about all subjects such as general profile, history of exposure to risky procedures or behaviours, family history of Hepatitis B infection, immunization against Hepatitis B in three doses etc.

The levels of HBsAg and HCV-Ab were being assessed by commercial Erba Lisa SEN HBsAg and Erba Lisa HCV Gen 3 (v2) ELISA kit respectively. For detection of Hepatitis B surface antigen, ELISA test was done based on "sandwich" principle with use of microtiter plates. The 3rd generation HCV Erba Lisa detects antibodies against HCV in human serum and plasma.

Inclusion Criteria

Donors who were about to donate and those who donated blood in the past decade were included in the study.

Exclusion Criteria

- Donors below 18 y and above 60 y of age.
- Donors having weight less than 45 kg.
- Volunteer donors having frequency of donation less than 3 months.

RESULTS

Table-1: Distribution of Donors According To Type of Donor (N=59495)

	Number	Percentage (%)
Replacement Donor	54028	90.81
Voluntary Donor	5467	9.19
Total *(n)*	59495	100.0

The above table shows distribution of donors according to type of donor. 54028 (90.81%) donors were Replacement Donors while only 5467 (9.19%) donors were Voluntary Donors.

Out of the total 59495 donors in past 10 years, 1020 (1.71%) were diagnosed to be HBsAg positive (Table-2). Out of the total 59495 donors in past 10 years, 475 (0.79%) were diagnosed to be HCV positive (Table-3).

74 (1.35%) of voluntary donors in last 10 years came out to be Hepatitis B positive (Table-4).

Table-2: Distribution of Total Donors According To Hepatitis B Status (N=59495)

	Number	Percentage (%)
Hepatitis B Positive	1020	1.71%
Hepatitis B Negative	58475	98.29%
Total *(n)*	59495	100.0

Table-3: Distribution of Total Donors According To Hepatitis C Status (N=59495)

	Number	**Percentage (%)**
Hepatitis C Positive	475	0.79%
Hepatitis C Negative	59020	99.21
Total *(n)*	**59495**	**100.0**

Table-4: Distribution of Voluntary Donors According To Hepatitis B Status (N=5467)

	Number	**Percentage (%)**
Hepatitis B Positive	74	1.35
Hepatitis B Negative	5393	98.65
Total *(n)*	**5467**	**100.0**

Table-5: Distribution of Voluntary Donors According To Hepatitis C Status (N=5467)

	Number	Percentage (%)
Hepatitis C Positive	58	1.06
Hepatitis C Negative	5409	98.94
Total *(n)*	**5467**	**100.0**

58 (1.06%) of voluntary donors in last 10 years came out to be Hepatitis C positive.

Table 6 shows the year-wise number of total donors and voluntary donors. It also shows the number of HBsAg.

Table-6: Year-Wise Distribution of Total Donors

Year	Total Donors	Voluntary Donors	HBsAg among Voluntary Donors	HCV among Voluntary Donors
2009	2381	386	4	5
2010	2914	471	7	8
2011	3288	662	12	7
2012	4649	547	8	5
2013	6816	739	8	10
2014	7351	458	6	6
2015	7986	498	9	4
2016	7782	564	8	4
2017	7901	673	6	5
2018	8427	469	6	4
Total	**59495**	**5467**	**74**	**58**

Table-7: Correlation of Hepatitis B Status with Type of Donor (N=59495)

	HbS Ag Positive	HbS Ag Negative
Voluntary	74	5393
Replacement	946	53082
Chi Square= 4.6523, p value= 0.0310 (significant)		

Table-8: Correlation of Hepatitis C Status with Type of Donor (59495)

	HCV Positive	HCV Negative
Voluntary	58	5409
Replacement	417	53611
Chi Square= 5.2386, p value= 0.02209 (significant)		

As per the above tables, there was significantly higher seropositivity among replacement donors as compared to voluntary donors.

DISCUSSION

The distribution of donors according to type of donors shows that in the last 10 years, we had 54028 (90.81%) replacement donors while only 5467 (9.19%) voluntary donors (Table-1). In the study by Qureshi *et al*., [6] the number of replacement donors and voluntary donors was 94406 and 3021 respectively. The percentage of voluntary blood donors in our study is a little higher than most of the studies. This may be the result of continuously increasing local awareness that is being spread by our blood bank at the community level. In the study by Silveira *et al*., [7], the proportion of voluntary donors was found to be 65.5% which is the highest among all the published studies on the subject.

The distribution of total donors according to hepatitis B status shows that there were total 1020 (1.71%) HBsAg positive blood donors in our study (Table-2). The number of HCV positive donors among total was found to be 475 (0.79%) as can be seen in Table-3.

Different prevalence studies found HBsAg and HCV positive donors in comparable proportions. A few studies from the Indian subcontinent are:

Study by	HbsAg Positive	HCV Positive
Shah SMA *et al*., [8]	1.97%	1.57%
Meena M *et al*., [9]	1.43%	0.57%
Bommanahalli *et al*., [10]	2.12%	0.1%
Ujjain ID *et al*., [11]	3.65%	8.68%
Present Study	1.71%	0.79%

The prevalence of Hepatitis B and Hepatitis C among voluntary blood donors in the present study was found to be 1.35% and 1.06% respectively (Table-4 & Table-5). Literature and doctors suggest there should be 100% voluntary donors. Replacement donors come into play only when there arises a need of blood transfusion in their acquaintances. Such people are not always aware of their HBsAg or HCV status. Also, there is a possibility of blood transfusions being done at such smaller healthcare institutions which may ignore the strict protocols of pretesting of blood prior to transfusion either due to lack of supervision or due to utmost emergency having no time in hand.

Table-6 shows the year-wise distribution of blood donors at our hospital during past 10 years. It also shows the seroprevalence of Hepatitis B and Hepatitis C among total donors as well as voluntary donors. The significance level is being assessed in further tables. An interesting finding is to note an increasing number of blood donation every year. On one hand, it depicts that the need of blood transfusion is increasing continuously with time. On the other hand, the increasing number of donations gives a hope that awareness is increasing among the common man and that we may hope that all 100% blood donations may become voluntary some day. Many such period studies show an increasing trend in blood donation.

The present study shows that there is a significant correlation between Hepatitis B and C status and type of blood donor (Table-7 & Table-8). The replacement donors were found to have a much higher seropositivity as compared to voluntary donors. Meena *et al*., [9] observed that the seropositivity was significantly higher among replacement donors. The studies showing a higher prevalence of seropositivity among replacement donor compared to voluntary donors are the studies by Kumar A *et al*., [12], Singh K *et al*., [13], Pahuja *et al*., [14] etc. Chandra *et al*., [15] found almost negligible infection rate among voluntary donors. This is obvious that the voluntary blood donors are usually aware of their infection status. And this is the main reason for promoting a non-remunerated voluntary blood donation.

CONCLUSION

A large proportion of HBsAg and HCV infected individuals are not aware of their infective status. It is not only dangerous to not know this as these infections are also sexually transmitted to the spouse or any other sexual partners of such individuals. Also, at the time of emergency for the need of blood, such individuals may be a false assurance of source of blood until being tested and refused by the blood bank before actual donation. This may aggravate the situation by rendering in need to search for another source of blood. An increased public health education on the subject is necessary especially for those at a higher risk. Also, voluntary blood donation should be encouraged to fetch safe and tested blood in contrast to the replacement donation where transfusion-transmitted infections tend to be much higher.

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