Knowledge and Attitude Regarding Hepatitis B and C Among Blood Donors and Nondonors in North India

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Background: The selection of a low-risk blood donor involves a dialogue between the trained medical staff and the volunteer blood donor, and this is where the knowledge of the prospective blood donor with regard to the risk factors for acquiring hepatitis B and C and the mode of spread through a blood transfusion is of utmost importance. Therefore, the study was conducted to assess the knowledge and attitude on hepatitis B and C with regard to blood donation, in the existing and the potential donor base. **Materials and methods:** This is a cross-sectional study conducted on 4000 participants, including 2000 blood donors and 2000 nondonors. The study tool was a pilot-tested, self-administered questionnaire, content and construct validated using Delphi methodology. **Results:** The mean age of the study participants was 25.12 ± 8.43 years ranging from 18 to 60 years; 24.64 ± 8.31 years in donors and 25.61 ± 8.55 years in non-donors. The study included 69.8% males and 30.2% females, with 87.5% males and 12.6% females in donors and 52.1% males and 47.9% females in non-donors. Overall knowledge score was 51.02%, being 51.21% in donors and 50.84% in non-donors. Overall attitude score was 47.93%, being 47.09% in donors and 48.77% in non-donors. There was a low degree of significant linear correlation between knowledge and attitude in the study participants. **Conclusion:** Based on the results obtained in the study, it is evident that neither the existing level of knowledge nor the attitude of both donors and nondonors towards hepatitis B and C is adequate for being able to select a low-risk blood donor. (J CLIN EXP HEPATOL 2019;9:318–323)

The system in place for blood safety involves the first and foremost the collection of blood from a low-risk blood donor, followed by quality assured transfusion transmissible infections (TTIs) serological screening apart from the molecular testing as an additional layer of safety and quality practices during collection, processing and storage of blood and blood components.

Blood donor selection is targeted on identifying donors at low risk of infection, while donor deferral criteria are used to distinguish those at high risk of infection, based on the epidemiology of the TTIs. In practice, this is performed using the uniform donor history questionnaire and consent proforma, which act as a checklist covering

the spectrum of the questions that are required to screen out donors who have been exposed to the risk factors for hepatitis. Therefore, blood donor selection process has to keep evolving to meet the variation in the epidemiology of TTIs coupled with the differences owing to educational, cultural and socio-economic diversity of the donor population.^{1,2}

However, just like the innate immunity barrier of the human immune system, the donors who pass the selection process donate blood, and the blood, thus, becomes part of the quarantine blood inventory. Only those units that test negative during TTI testing will then be taken into the ready to issue stock. Therefore, to have the safest possible blood inventory, the process of the selection of a low-risk blood donor is the most crucial step. This step involves a dialogue between the trained medical staff and the volunteer blood donor, and this is where the knowledge of the prospective blood donor with regard to hepatitis B and C assumes importance of significance for blood safety.

A baseline assessment of the knowledge and attitude of the blood donor and the potential prospective blood donor of the future (at present nondonor) with regard to the TTIs is the cornerstone around which all targeted information,

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Abbreviations: GoI: Government of India; HIV: human immunodeficiency virus; IEC: information, education and communication; MoHFW: Ministry of Health and Family Welfare; TTIs: Transfusion Transmissible Infections

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Figure 1 Study algorithm.

education and communication (IEC) for improving blood safety should be based. The need for the study was felt after the observation that there has been a decreasing trend in the prevalence of human immunodeficiency virus (HIV) in blood donors at our institute (anti-HIV-1 and anti-HIV-2 antibodies) from 0.8% to 0.04% over the last decade.³ This was because of the creation of a dedicated cell of National AIDS Control Organisation in the Ministry of Health and Family Welfare (MoHFW), Government of India (GoI), which had definite objectives and work plan to decrease the spread of HIV.⁴ The state-level cell (State AIDS Control Societies) has worked towards increasing the awareness about HIV/AIDS in the general population (potential blood donors), in addition to motivating behaviour change in the high-risk group population, raise awareness about the need for behaviour change among the vulnerable population. However, the prevalence of hepatitis B virus (HBsAg) demonstrated an initial trend of decrease but reached a plateau of around 0.5%, while on the other hand the prevalence of hepatitis C virus (anti-hepatitis C virus antibodies) has remained around 0.5%.³ The pressing need for the study was noted when no published literature on the knowledge and attitude about hepatitis B and C in blood donors was found at the time the study was conceptualised. Therefore, the present study was conducted with the aim of assessing the knowledge and attitude on hepatitis B and C in the both the existing

blood donors and the potential blood donors (non-donors at present) of tomorrow.

MATERIAL AND METHODS

The study was conducted at the venue of the outdoor voluntary blood donation camps of the Department of Transfusion Medicine of the tertiary care research and referral institute of North India. The ethical committee of the institute approved the study, and written informed consent was taken from each study participant. Study algorithm is depicted in [Figure 1](#).

Study Design

This is a cross-sectional study.

Null Hypothesis

The presumption for the study is that the two groups included in the study of donors and nondonors do not differ in knowledge and attitude on hepatitis B and hepatitis C with regard to blood donation.

Study Tool

The study tool used was a prevalidated and pilot-tested self-administered structured questionnaire.

Donors

The study recruited the blood donors selected for blood donation on the basis of the blood donors selection criteria as per the Drugs and Cosmetics Act of 1940 and the rules therein of 1945, MoHFW, GoI.⁵

Non-donors

The non-donor participants included in the study were the people present at the blood donation venue, not volunteering to donate blood on the day nor have had donated blood any time earlier.

Part I of the questionnaire included socio-economic parameters (education, occupation and the monthly family income) of the participant based on the Kuppuswamy scale⁶ but grouped into 2 categories for the ease of comparison. Group I included participants with honours specialisation, graduates and post graduates and group II with intermediate, high, primary school-level education and illiterate participants on the basis of education. Group I included professionals and semiprofessionals, and group II included clerical, shop owners, farmers and skilled, semi-skilled, unskilled workers and unemployed participants on the basis of occupation. Finally, participants with monthly family income above Rs 18,000/- were included in group I and all those with less in group II.

Part II included questions about general knowledge on hepatitis and specific to hepatitis B and C to be answered in

'yes, no or do not know' format. The questions covered the spectrum on causative organism, mode of spread, signs and symptoms, investigations, treatment and prevention of hepatitis B and C as relevant to blood donation. For knowledge questions, among the yes, no and do not know options, the correct response was given score '1', and the other responses were given score '0'.

Part III of the questionnaire included questions about attitude on hepatitis B and C as relevant to blood donation, including both positive and negative items to be answered as agree, disagree or not sure. Overall positive attitude was measured as agree to positive items and disagree to negative items (scored as '1') and negative attitude as agree/not sure to negative items and disagree/not sure to positive items (scored as '0').

The framework of the questionnaire was prepared by the authors from the transfusion medicine, but construct and content validation was performed after incorporation of the opinion of the experts from the departments of hepatology, psychiatry, community medicine (School of Public Health) of the institute using the Delphi methodology. The questionnaire was pretested on 20 blood donors donating blood at the blood donation centre of the institute for the pilot testing.

Sample Size

The annual blood collection at the blood donation camps is around 40,000 units of volunteer blood, and for the study, we choose 10% of the annual collection using purposive sampling. The study target was to enrol 4000 participants including 2000 donors and 2000 non-donors.

Participant Selection

Participant selection was performed by convenience sampling (voluntary nonrandom).

Statistical Analysis

Data were analysed based on the objectives using descriptive and inferential statistics. The data collected were transferred to a master sheet for each section of the tool. Demographic data related to respondents were analysed in terms of percentage, mean, range and so forth. Percentage and *P*-value for comparative knowledge score for blood donors and non-donors were analysed. Frequency and percentage were calculated for the attitude of blood donors and non-donors. Spearman's rho correlation was used to check the correlation of knowledge with attitude. All the statistical tests were two sided and at a significance level at $P < 0.05$.

RESULTS

The study included 4000 participants, comprising 2000 blood donors and 2000 non-donors. The overall mean

Table 1 Demographic Details of Study Participants.

Variable	Donors (N = 2000)	Nondonors (N = 2000)	P value
Age (years)	24.64 ± 8.31	25.61 ± 8.55	0.25
Gender			
Male	1749 (87.5%)	1042 (52.1%)	0.000
Female	251 (12.5%)	958 (47.9%)	
Education			
Group I	1172 (67.6%)	1303 (67.2%)	0.82
Group II	562 (32.4%)	635 (32.8%)	
Missing data	266 (13.30%)	62 (3.10%)	
Occupation			
Group I	523 (30.8%)	507 (26.5%)	0.004
Group II	1177 (69.2%)	1407 (73.5%)	
Missing data	300 (15.00%)	86 (4.30%)	
Monthly family income			
Group I	1239 (72.7%)	1429 (75.0%)	0.13
Group II	466 (27.3%)	478 (25.0%)	
Missing data	295 (14.75%)	93 (4.65%)	

age of study participants was 25.12 ± 8.43 years ranging from 18 to 60 years, 24.64 ± 8.31 in donors and 25.61 ± 8.55 in non-donors. Occupation-level group I included 30.8% donors and 26.5% non-donors; group II included 69.2% donors and 73.5% non-donors. Education-level group I included 67.6% donors and 67.2% non-donors; group II included 32.4% donors and 32.8% non-donors. Family income per month-level group I included 72.7% donors and 75% non-donors; group II included 27.3% donors and 25% non-donors as depicted in Table 1.

On an average, 33 (1.65%) and 42.7 (2.13%) donors and 14.4 (0.72%) and 8.4 (0.42%) non-donors did not answer the items related to knowledge and attitude, respectively. Details of knowledge and attitude scores are depicted in Tables 2 and 3, respectively. There was a low degree of significant linear correlation between knowledge and attitude ($r = 0.296$, $P < 0.01$) observed in the study.

DISCUSSION

There are studies assessing knowledge and attitude on hepatitis B and C in non-blood donor population (medical, dental and university students).⁷⁻¹⁵ But there is only one study on this topic conducted on blood donors from Nigeria, that too, enrolling only 100 donors.¹⁶ The present study is the first study on the topic enrolling 4000 blood donors and non-donors from India.

Overall, the knowledge score was 51.02% in the study participants; there was no statistical difference in the knowledge level between donors and nondonors (51.21% vs. 50.84%, $P = 0.35$).

Table 2 Knowledge Score With Respect to Hepatitis B and Hepatitis C and Blood Donation.

Knowledge questions	Donor (correct response %)	Nondonor (correct response %)	Chi square	P value
Causative organism				
Hepatitis can be caused by organisms such as virus	1227/1988 (61.7%)	1223/1990 (61.5%)	0.017	0.89
Modes of spread				
Can spread by unsafe sexual practices	839/1980 (42.4%)	858/1988 (43.2%)	0.369	0.54
Can spread by unsafe injection practices	1271/1954 (65.0%)	1364/1986 (68.7%)	10.55	0.005
Can spread by sharing water/food from same glass/plate	958/1980 (48.4%)	954/1990 (47.9%)	0.016	0.89
Can spread by contact with blood and blood products	1222/1950 (62.7%)	1299/1987 (65.4%)	6.36	0.012
Can spread by eating raw fish	595/1962 (30.3%)	483/1986 (24.3%)	16.85	0.000
Can spread during child birth from mother to child	1055/1958 (53.9%)	1026/1979 (51.8%)	1.87	0.39
Can spread by sharing shaving razors	863/1952 (44.2%)	865/1986 (43.6%)	1.00	0.60
Can spread by someone who looks healthy	486/1973 (24.6%)	559/1983 (28.2%)	6.90	0.009
Signs, symptoms and disease				
Persistent hepatitis can cause advanced disease such as cirrhosis and liver cancer	1059/1985 (53.4%)	1070/1988 (53.8%)	0.12	0.72
Majority of patients with hepatitis show early symptoms resembling common cold, fever and/or diarrhoea/loose motions	1004/1966 (51.1%)	1062/1986 (53.5%)	3.36	0.66
Only few persons infected with hepatitis ultimately develop jaundice/yellowing of eyes	923/1965 (47.0%)	821/1987 (41.3%)	10.57	0.001
Hepatitis once caused by infection can persist for life long	702/1958 (35.9%)	737/1980 (37.2%)	1.33	0.25
Investigations for diagnosis				
Hepatitis can only be identified by a blood test	1169/1956 (59.8%)	1153/1981 (58.2%)	1.25	0.53
Prevention and treatment options				
Effective medications are available to treat hepatitis infection	1389/1957 (71.0%)	1377/1979 (69.6%)	1.18	0.55
Hepatitis B is preventable by vaccination	1355/1987 (68.2%)	1372/1993 (68.8%)	0.33	0.56
Overall	16,117/31,471(51.21%)	16,153/31,769 (50.84%)	0.85	0.35

In the present study, the correct response on the spread of hepatitis by unsafe injections was 66.8% (65.0% in donors vs. 68.7% in non-donors, with statistical significance at $P < 0.05$), whereas it was 84.3% in the only other study from India (conducted on healthcare workers/medical, dental and nursing interns). This varied from 34% to 94.7%, 71.7% to 96.7% and 87.5% in the studies conducted in Pakistan, Ethiopia, and Bulgaria, respectively.⁹⁻¹⁴

The correct response on the spread of hepatitis by blood transfusions was 64.1% (62.7% in donors vs. 65.4% in non-donors, with statistical significance at $P < 0.05$), whereas it was 100% in the other study from India because it was on healthcare interns. This varied from 37.9% to 90.3% and 89.8% to 97.2% in the studies conducted in Pakistan and Ethiopia, respectively.⁹⁻¹³

The correct response to the spread of hepatitis by unsafe sexual practices was 42.8% (42.4% in donors vs. 43.2% in non-donors), whereas it was 76.1% in the other study from India. This varied from 10.1% to 63.2%, 65.5%–84.1% &

38% in the studies conducted in Pakistan, Ethiopia and Nigeria respectively.^{10-13,16}

The correct response to the spread of hepatitis by sharing of razors was 43.9% (44.2% in donors vs. 43.6% in non-donors). This varied from 33.3% to 89.7% and 66.0% in the studies conducted in Pakistan and Nigeria, respectively.^{9-11,16}

The correct response to the spread of hepatitis from mother to child was 52.8% (53.9% in donors vs. 51.8% in non-donors). This varied from 24.0% to 74.1% and 55.9% in the studies conducted in Pakistan and Ethiopia, respectively.¹⁰⁻¹²

The correct response to prevention of hepatitis by vaccination hepatitis B virus (HBV) was 68.5% (68.2% in donors vs. 68.8% in non-donors at $P = 0.56$). This varied from 59.5% to 85.0%, 84.6% to 93.2% and 70.8% in the studies conducted in Pakistan, Ethiopia and Bulgaria, respectively.^{8,9,12,14}

The correct response on the identification of hepatitis blood tests was 64.1% (59.8% in donors vs. 58.2% in

Table 3 Attitude Towards Hepatitis B and Hepatitis C With Respect to Blood Donation.

Attitude	Donor	Nondonor	Chi Square	P value
Positive items (% agreed)				
Donors who have engaged in any risk factor for hepatitis should not donate blood	1390/1954 (71.1%)	1455/1990 (73.1%)	5.14	0.02
If I am hepatitis positive and I had to donate because of peer pressure, I should later on call and inform blood bank	1193/1960 (60.9%)	1197/1997 (59.9%)	2.01	0.57
Blood donor should disclose any risk factors for hepatitis correctly before blood donation	1624/1962 (82.8%)	1684/1992 (84.5%)	7.05	0.02
Family members should not share items such as shaving razors, blades or nail cutters with people having hepatitis	1207/1960 (61.6%)	1317/1992 (66.1%)	12.99	0.00
A donor who has been in close contact with patient having hepatitis should not donate	556/1958 (28.4%)	658/1990 (33.1%)	12.30	0.00
Positive items ^a	5970/9704 (60.95%)	6311/9961 (63.35%)	12.11	0.0005
Negative items (% disagreed)				
Spending money on getting vaccination for hepatitis B is a waste	1246/1969 (63.3%)	1340/1995 (67.2%)	10.73	0.001
I want a checkup for hepatitis; blood donation is the best way for a free checkup	322/1960 (16.4%)	362/1988 (18.2%)	4.70	0.03
I had hepatitis long back, am okay now, so I can donate blood	634/1963 (32.3%)	709/1994 (35.6%)	7.16	0.007
I have been vaccinated for hepatitis B; therefore, I am completely free from infection	344/1950 (17.6%)	271/1993 (13.6%)	8.29	0.004
I received a call from the blood bank after my last donation, but did not follow up with the blood bank. Even then I can donate blood	701/1937 (36.2%)	722/1985 (36.4%)	1.40	0.23
Negative items ^a	3247/9779 (33.20%)	3404/9955 (35.81%)	2.16	0.14
Overall	9217/19,573 (47.09%)	9715/19,916 (48.77%)	11.1	0.0008

^aTotal score (donor plus nondonor) for positive items vs. negative items, Chi square = 3261, $P < 0.001$.

nondonors at $P = 0.53$). This varied from 94.4% to 96.7% in the studies conducted in Ethiopia.^{12,13}

Overall, the attitude score was 47.93%, being 47.09% in donors and 48.77% in nondonors with the difference in means achieving statistical significance at $P < 0.05$. The correct response to positive items (60.95% in donors and 63.35% in nondonors at $P < 0.05$) was more when compared with negative items (33.20 in donors and 35.81% in nondonors). The difference in the means of attitude score was statistically significant at $P < 0.05$, when comparing positive items against negative items among the study participants, including both donors and non-donors. Implying that the study participants were more in agreement with the positive items, the disagreement to negative items was not to that extent and the difference could stand the test of statistical significance.

Overall positive attitude (% agreed to positive items and % disagreed to negative items) was 48.07% and negative attitude (% agreed to negative items and % disagreed to positive items) was 51.92%. In comparison with other studies, overall positive attitude was 64.25% and 67.2%, and overall

negative attitude was 35.75% and 32.8% in the studies conducted in Pakistan and Ethiopia, respectively.^{9,12}

A low degree of statistically significant linear correlation between knowledge and attitude was observed in the present study, and similar association has also been reported from Pakistan.¹¹

The analysis based on socio-economic parameters (education, occupation and the monthly family income) did not bring out consistent results.

The overall knowledge score was 50%, and attitude score was 48% among the study population. The knowledge score was similar between blood donors and non-donors, whereas the attitude score was more in nondonors when compared with blood donors, achieving statistical significance. This implies that blood donation per se does not increase awareness about the risk factors of acquiring of hepatitis B and C.

The authors acknowledge that the participant recruitment was limited to the venue of outdoor blood donation camps and thus may not be representative of the entire potential blood donor pool. Furthermore, the categorisation

on socio-economic characteristics was not homogenous, and a study on a much larger sample size may bring out a clearer picture of variations based on such differences. Finally, the authors could not recruit all participants as the consent was not volunteered by all. Thus a selection bias may not have been excluded.

CONCLUSION

Based on the results obtained in the study, it is evident that neither the existing level of knowledge nor the attitude of both donors and non-donors towards hepatitis B and C is adequate for being able to select a low-risk blood donor today. The results thereby reinforce the concept that IEC strategies will need to be specifically tailored to address the gaps identified on knowledge and motivate change in attitude that will then translate into practice over a period of time for laying the foundation of a safe future blood supply.

CONFLICTS OF INTEREST

The authors have none to declare.

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