

Sero-Prevalence of Hepatitis B and C Among Blood Donors Visiting DHQ Teaching Hospital, Sahiwal

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ABSTRACT

Objective: To determine Sero-prevalence of Hepatitis B and C virus among blood donors in local population of Sahiwal, Punjab, Pakistan.

Study Design: Descriptive, retrospective, cross-sectional Study

Place and Duration of Study: This study was conducted at the Blood Bank of DHQ Teaching Hospital, Sahiwal from August 2019 to November 2019.

Materials and Methods: Data from August 2014 to July 2019 was included. Blood grouping was done and serum extracted from blood donors was screened by the use of Immuno-Chromatographic Diagnostic Kits (ICT) for Hepatitis B (HBsAg) and Hepatitis C (Anti-HCV).

Results: A total number of 39114 subjects were investigated for Hepatitis B and C viral infections. Out of these 1775 (4.54%) were found to be Anti-HCV positive, 467 (1.19%) were HBsAg positive and 30 (0.08%) were positive for both. Hepatitis B infection was found more prevalent (33.83%) in blood group B and the highest prevalence of Hepatitis C was found in blood group O.

Conclusion: Prevalence of Hepatitis C is found high among blood donors visiting DHQ Teaching Hospital Sahiwal, which warrants mandatory regular screening for all blood donations to prevent transfusion related transmission of infections. There is dire need of implementation of community based preventive measures and improved strategies to decrease Sero-prevalence across the region.

Key Words: Anti-HCV, Hepatitis B, Hepatitis C, HBsA, Immuno-Chromatographic Diagnostic Kits (ICT), Sero-prevalence

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INTRODUCTION

Hepatitis B and Hepatitis C are considered to be a worldwide health issue especially in developing countries like Pakistan. Most of infectious diseases are spread through blood transfusion. In Pakistan, the social norms, cultural diversity, poor health delivery system, lack of proper health facilities and unsafe blood transfusion ways are responsible for high prevalence of Hepatitis B and C from blood donors to the recipients¹. The other major modes of transmission of these infectious diseases in Pakistan are also use of adulterated needles, razors in barber shops, tattoo

created with unsterilized needle, unsterilized equipment in medical practice and sharing things of personal use with infected persons. It can be transmitted vertically from an infected mother to her infant as well as during breast feeding.

In Pakistan annually round about 1.5 million units of blood or blood products are transfused as reported by WHO. Of this 15% are from professional donations, 75% are from replacement donations and 10% are from voluntary unpaid donations². Epidemiological individualities and risk factors for transmission of infection are different from region to region across the country³. It has been reported that the occurrence of Hepatitis B and C viruses varies according to locality in different parts of country. According to various studies directed at various times the prevalence of HBV and HCV infections is 1.1%–6.2% and 2.06%–7.69% respectively in Pakistan^{4,5}. A gradual decrease in prevalence of HBV is noted, which may be the result of introduction of immunization program against HBV infections from birth and at different stages of life⁶. Conversely, an increase in prevalence of HCV is noted that is because ineffective and improper vaccine against it. In 2003, The Federal Ministry of Health, Pakistan made a National Blood Policy to ensure appropriate

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screening of blood before labeling it safe for transfusion⁷. In Pakistani population, the risk of spread of Hepatitis B and C viruses through blood transfusion has been observed to be high which is certainly because of deficiency of proper screening of blood before transfusion and awareness in past. The other reason of so much high spread rate of HBV may be the late introduction of vaccination⁸. However, the continuous spread of Hepatitis B and C viruses in the community may increase to develop high risk of morbidity and mortality among infected persons due to its chronic carrier state, which ultimately end up with Acute-on-Chronic Hepatitis, Fulminant Hepatic Failure, Liver Cirrhosis and Hepatocellular Carcinoma (HCC)^{10,11}. The main objective to conduct this study was to assess the prevalence rate and minimize the potential of spread of Hepatitis B and Hepatitis C viruses amid the healthy blood donors at Sahiwal, Pakistan.

MATERIALS AND METHODS

A descriptive, retrospective, cross sectional study was conducted in DHQ Teaching Hospital, Sahiwal from August 2014 to July 2019 after getting the data of blood donors over period of five (5) years from Blood Bank. The current study is based on official records of Blood Bank of DHQ Teaching Hospital, Sahiwal. During the described period, a total number of 39114 blood donors visited Blood Bank of this institute, and all of the donors were screened for Anti-HCV and HbsAg^{9,11}. Physically healthy donors, some of them with history of pre-donation screening test for HBsAg and Anti- HCV, within the age range of 16-60 years of both genders, were included in this study. Those donors who had history of pervious exposure to HBV, HCV and HIV infection were excluded. 3ml blood sample was collected from each donor and samples were sent to Laboratory of DHQ Teaching Hospital for screening of HBsAg and Anti-HCV by using rapid Immuno-Chromatographic Test (ICT) Kit^{12,17}.

RESULTS

In our study data of total number of 39114 blood donors were analysed from August 2014 to July 2019 with an average of 6512 donations per year. Of these donors 99.9% were male. These were mixed donors (volunteers, replacement or direct donors). Average age of the blood donors was 23 years (range 16-60 years). This comparison shows that HBsAg positive donors are younger than Anti-HCV positive donors. Blood grouping was also done for all the HBsAg positive donors and Anti-HCV antibody positive donors. The prevalence of HBV and HCV were almost same among all the blood groups but the blood group B+ve showed maximum prevalence for HBV and blood group AB-ve showed minimum prevalence for HBV. For HCV blood

group O+ve showed maximum prevalence and blood group AB-ve showed minimum prevalence.

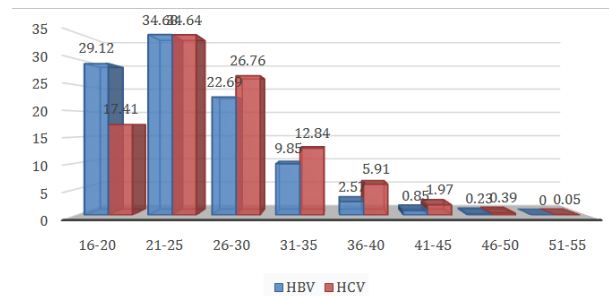


Figure No.1: Comparison of age group distribution of Hepatitis B and Hepatitis C

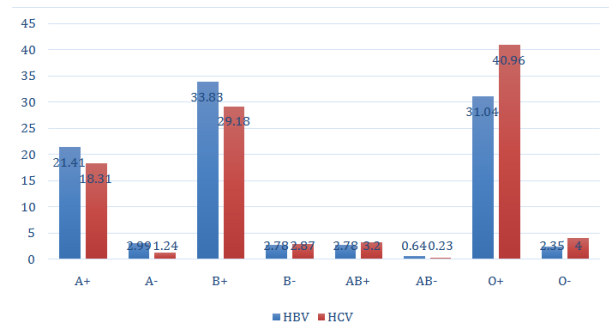


Figure No.2: Blood Group Distribution of Prevalence of Hepatitis B and Hepatitis C

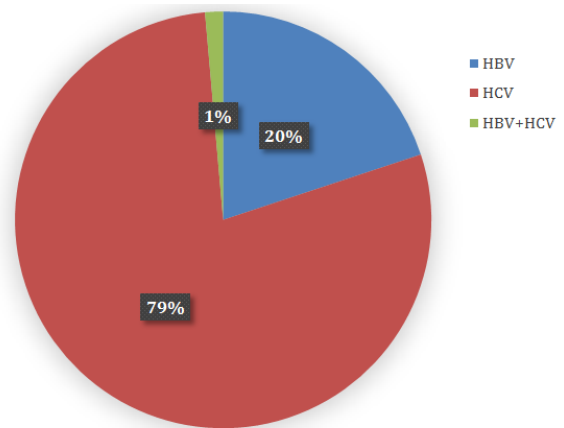


Figure No.3: Comparison of prevalence of Hepatitis B, Hepatitis C and Both Hepatitis B & C in infected blood donors

Table No.1: Year-wise distribution of number of cases of Hepatitis B and C among Blood Donors

Year	No. of Donations	HBsAg positive		Anti-HCV positive		HBV+HCV positive	
		No.	%	No.	%	No.	%
2014	2236	22	0.990	131	5.858	0	0.000
2015	9936	130	1.310	439	4.418	9	0.090
2016	6085	67	1.101	269	4.420	6	0.098
2017	6937	92	1.326	278	4.007	6	0.087
2018	11190	114	1.018	457	4.084	7	0.063
2019	2730	42	1.540	201	7.362	2	0.073

Table No.2: Comparison of Prevalence of Hepatitis B and Hepatitis C in Consecutive Years

Years	HBsAg	Anti-HCV
2014 vs 2015	0.99% vs 1.31%	5.85% vs 4.42%
2015 vs 2016	1.31% vs 1.10%	4.42% vs 4.42%
2016 vs 2017	1.10% vs 1.32%	4.42% vs 4.00%
2017 vs 2018	1.32% vs 1.02%	4.00% vs 4.08%
2018 vs 2019	1.02% vs 1.54%	4.08% vs 7.36%

The prevalence data for HBsAg and Anti-HCV antibody for each year was compared with each successive year. There was irregular increasing and decreasing trend of prevalence.

A total of 2242 blood donors were found to be infected with Hepatitis B and C. Out of these 2242 cases 79% were anti-HCV antibody positive, 20% were HBsAg positive and 1% were positive for both anti-HCV antibody and HBsAg.

DISCUSSION

In the current study an effort has been made to estimate the sero-prevalance of Hepatitis B and C viruses after analysis of healthy donor's population from Sahiwal region, Punjab, Pakistan^{9,12,19}. Age distribution is shown in Figure 1 and 2. The earlier peak of Hepatitis B could be due to vertical transmission of HBV in our population. In this study, donors less than 16 years of age were not considered so it was not possible to assess the minimum age of acquisition of HBsAg. Cross sectional sero survey of population less than 16 years may show the age of highest prevalence of HBV in our population^{7,15}.

WHO's Criteria for endemicity of Hepatitis B virus in different countries by dividing into low endemic, intermediate endemic and high endemic region²¹. In countries, where carrier rate is less than 3% fall in the low endemic region, those with carrier rate is between 3-5% come in intermediate endemic region and those are more than 5% in high endemic region. There is high possibility to cause a major disease burden in our country due to low EPI coverage of Hepatitis B vaccination in some of districts. To improve the vaccination status in countries having endemicity of hepatitis B virus, supportable strategies have to be laid down. About 3% of world population is suffering from HCV infection and on the other hand in Pakistan the prevalence of HCV infection is about 5%. Both Hepatitis B and C viruses are present in the population of Pakistan, though the data available about their prevalence varies in different studies^{9,13,14}. Globally, HCV is considered to be the fatal, which has more hazardous than HBV because there are often no clinical signs and symptoms until HCV is diagnosed, huge damages have already been done to the patients. According to some research studies, there are about 9 million HBV carriers in Pakistan and over 14 million HCV carriers^{15,17}. These figures could not be biased due to limited resources and the population sample selected

is limited to a specific area or part or high-risk group. Since our male population starts their occupation and become socially and sexually active in the earlier half of their third decade of life. The late positivity of HCV may be due to this late exposure to the risk factors for HCV. Detailed epidemiological studies are required to correlate these observations with prevalence of Hepatitis C¹⁶.

Overall prevalence of Hepatitis B during these 5 years was 1.21% which is comparable to the previous studies conducted in different districts of Pakistan^{6,18}. The study shows irregular downward and upward trends during this period. There is no obvious explanation for this irregular trend. The average sero-prevalence of Hepatitis C was 5.03% which was 3.82% higher than Hepatitis B prevalence. These results were also comparable to the previous studies conducted in different districts of Pakistan^{9,19}. The higher prevalence of Hepatitis C maybe due to non-availability of vaccine, non-availability of wider screening methods and absence of screening of donors for HCV in many centers. It may be due to a common practice of using used syringes while giving injections and an unknown mode of transmission other than parenteral route. The maximum sero-prevalence of both Hepatitis B & C among the positive blood group donors may be owing to the reason that positive groups are more common^{22,23}.

CONCLUSION

In conclusion, our retrospective cross sectional study of healthy donors visiting DHQ Teaching Hospital, Sahiwal, reveals that both Hepatitis B and C viruses affect younger age groups which ultimately leads to Liver related diseases (e.g Liver Cirrhosis, Fulminant Liver Failure & HCC) thus putting extra burden on Healthcare Delivery System. Furthermore, to decrease the prevalence of both viruses, auxiliary information about risk of transmission of Hepatitis B and Hepatitis C from donors must be included in the donation form. It is important to take adequate steps to strengthen the vaccination program for Hepatitis B virus and stop the modes of transmission of Hepatitis C virus.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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