

Prevalence Of Hepatitis-B and Hepatitis-C In Blood Donors of Southern Punjab and The Level of Their Liver Function

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ABSTRACT

Objectives: The main objectives of this study were to assess the prevalence of hepatic infection (HBsAg and anti-HCV) in blood donor of Nishtar Hospital, Multan, to evaluate the effectiveness of techniques for the detection of HBsAg and anti-HCV and to find the level of liver function in persons found positive and negative for Hepatitis-B and C.

Materials and Methods:

Study Design: Cross sectional study

Study Setting: Blood bank of Nishtar Hospital, Multan

Study Duration: From January to December 2024.

Data Collection and Analysis: A total of 6865 blood donors (males: 6528 Females: 337) who visited the blood bank of Nishtar Hospital, Multan for blood donations during the year 2024 were included in the study. The data on blood donors referred from various wards of Nishtar Hospital to blood bank was collected. Record of Hepatitis-B antigen (HBsAg), Hepatitis-C antibodies (Anti HCV) and levels of LFT markers was also maintained for comparison between different groups of the study. The blood donors referred to blood bank were divided into three groups depending on the presence or absence of hepatitis markers.

Results: A total of 6865 blood donors (males: 6528 Females: 337) who visited the blood bank of Nishtar Hospital, Multan for blood donations during last one year were included in the study. The mean age of these persons was 44.4±7.6 years (range: 18-55). The average anti-HCV positive rate was 0.62% (29/4562), which was 1.07% in the rural population, compared to 0.22% in the urban population. The anti-HCV positivity rate in the 40–59-year age group was higher than in those aged <40 years. History of blood transfusion and transmission in families were the main risk factors for HCV infection in this area. The analysis of the records of blood donors showed that most of them belonged to B⁺(45.8%) and then A⁺ (27.2%). Out of 6865 blood donors, 323 (4.7%) were found positive for HBsAg. whereas 327 (4.8%) were found positive for HCV infection. The incidence of HBV and HCV in males and females was approximately equal.

Conclusion: We conclude that the incidence of HBs and HCV is very high in general population of southern Punjab. This shows that the screening procedure for HBS and HCV adapted by blood bank is not very efficient and gives many false negative results.

Keywords: Hepatitis B, Hepatitis C, Screening.

1. INTRODUCTION

Viral infections are at the main cause of mortality. The most common viral infection is hepatitis which is the most frequent cause of death in Pakistani population. [1] Even though one out of 10 Pakistani suffers from the virus of either Hepatitis B or C, the hepatitis-infected population of 15 million awaits the proper implementation of a National Programme for Prevention and Control of Hepatitis in Pakistan to control the deadly disease [2]. Unsafe drinking water, unscreened blood transfusion and the rampant use of used syringes have spread hepatitis, making it one of the biggest concerns for the country's health managers. [3] Health professionals and government officials give conflicting statements about the prevalence rate of Hepatitis B in the country. Going by their statements the prevalence rate may vary from 4.8 to 5.8 percent. [4] Millions of Pakistanis have been infected with the deadly virus, but no public department or agency has accurate information about the number of positive cases. Going by the figure of 5.8 percent prevalence rate, there may be around 8 million Hepatitis B patients in the country. Hepatitis B and C are global health problems as worldwide 350 million people are carriers of the Hepatitis B virus. [5] The virus causes a deadly liver disease having same mode of transmission as AIDS. Medical experts believe that the Hepatitis B virus was spreading fast because of ignorance among the patients and a lack of proper preventive measures. There are five types of hepatitis- A, B, C, D and E - of which A and E are caused through oral infection, contaminated water and unhygienic food. Hepatitis B, C and D are caused through un-sterilised syringes, sexual relation, and blood transfusion and from mother to newborn baby. [2,5,6] The disease is transmitted by body fluids such as blood, semen, saliva and vaginal secretions. It is claimed that the Hepatitis B virus is 100 times more concentrated in the blood than the HIV virus making it much easier to spread. Hepatitis C is often called a 'silent epidemic' and it can live in the body for decades, often with no symptoms, while attacking the liver. The long-term consequences of Hepatitis C can include liver disease, liver cancer and death. There is also no cure for Hepatitis C. Prevalence of hepatitis may be higher than reported. In another work on hepatitis, writes, "Pakistan is endemic area for viral hepatitis B. It is more aggressive due to co-infection and super-infection with delta virus. Intra-familial spread of hepatitis B is quite high. [1]

The highest reported incidence in spouses is 23.5 percent. Pakistan has a high carrier rate of hepatitis B. It is between 10 to 14 percent with ELISA and RIA techniques respectively. Hepatitis B is more prevalent in males as compared to females (8.13%/6.7% respectively). Transplacental transmission from mother to infant is not the major route of transmission for HBV, as none of the infants of HBV positive mothers had HBsAg in cord blood. The route of transmission of hepatitis B in infants is horizontal from mother to infants as they are close to mothers during infancy. Hence infants of hepatitis B positive mothers must be vaccinated against hepatitis B. Sub types of hepatitis B have different geographical distribution. The four major sub types of HBsAg are ayw, adw, adr, and ayr. In our country, the most prevalent sub type is ayw (78-95%), adw prevalence is (2.4-14%), adr (1.0-7.7%) and ayr (2.4%). Delta hepatitis poses a common community health problem in Pakistan. [6]

The prevalence of active hepatitis B and chronic hepatitis C in Pakistan, analyzing data separately for the general and high-risk populations and for each of the four provinces and included 84 publications with 139 studies in their review. They estimated the likely range of prevalence in different population sub-groups. A weighted average of hepatitis B antigen prevalence in pediatric populations was 2.4% (range 1.7-5.5%) and for hepatitis C antibody was 2.1% (range 0.4-5.4%). A weighted average of hepatitis B antigen prevalence among healthy adults (blood donors and non-donors) was 2.4% (range 1.4-11.0%) and for hepatitis C antibody was 3.0% (range 0.3-31.9%). Rates in the high-risk subgroups were far higher. [7,8,9].

This study aim to evaluate hepatitis B and C infection among blood donors as Pakistan carries one of the world's highest burdens of chronic hepatitis and mortality due to liver failure and hepatocellular carcinomas. However, national level estimates of the prevalence of and risk factors for hepatitis B and hepatitis C depicts a major burden of disease. [10-14]

Objectives: The main objectives of this study were to assess the incidence of hepatic infection (HBS and HCV) in blood donor of Nishtar Hospital, Multan, to evaluate the effectiveness of techniques for the detection of HBs and HCV and to find the level of liver function in persons found positive and negative for Hepatitis-B and C.

2. SUBJECTS AND METHODS

This retrospective study was conducted from January to December , 2024; in collaboration between Department of Chemistry, Bahauddin Zakariya University, Multan and Institute of Nuclear Medicine and Radiotherapy (MINAR). The experimental work was performed at Biochemistry Laboratory of MINAR. All the volunteer blood donors of Nishtar Hospital, Multan who donated blood during the study period were included in the study. The inclusion criteria followed was age 18-60 years, weight more than 50 kg and a hemoglobin concentration above 13 g/dL. The data on blood donors referred from various wards of Nishtar Hospital to blood bank was collected. Age, sex and addresses of these donors were noted in a record register. Record of Hepatitis-B antigen (HBsAg), Hepatitis-C antibodies was also maintained. A thorough medical history was taken by a medical officer to ensure that the donor is free of all communicable diseases. The exclusion criteria used was history of jaundice, malaria, drug addiction, anemia, history of repeated transfusions and any evidence of cardiac, renal, or pulmonary disease.

3. RESULTS

The distribution of blood donors bled at Blood bank of Nishtar Hospital during last one year; according to their blood groups is Fig-1. The analysis of the records of blood donors showed that most of the blood donors belonged to A⁺ (27.2%), B⁺ (45.8%), AB(7.7%)⁺ and O⁺ (15.8%) blood groups. Table-1 shows the percentages of HBsAg and HCV observed in this population. Out of 6865 blood donors, 323 (4.7%) were found positive for HBsAg, whereas 327 (4.8%) were found positive for HCV infection. Comparison of the incidence of HBV infection between males and females shows that the prevalence of these infections in blood donors is not statistically different (p= 0.8722). The incidence of HCV infection in females (5.3%) is also not significantly higher (p=0.1225) than the incidence of HBsAg (3%).

Table 1: Distribution of HBsAg positive and HCV positive rate among subjects and its gender distribution

	Total	HBsAg positive	HCV positive
Total	6865	323 (4.7%)	327 (4.8%)
Males	6528	313 (4.8%)	309 (4.7%)
Females	337	10 (3%)	18 (5.3%)
P value		p=0.1225	p= 0.8722

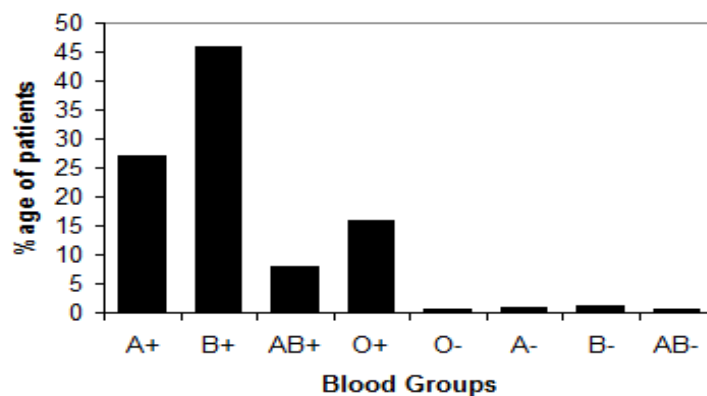


Fig 1: Distribution of Blood groups in all blood donors

The main cause of chronic hepatitis in Pakistan is said to be HBV and HCV. Pakistan carries one of the world's highest burdens of chronic hepatitis and mortality due to liver failure and hepatocellular carcinomas is very high in our population.

Table 2: The prevalence of Hepatitis B and C Observed at various regions of the country

Author & Year	Place of Study		Anti-HCV	HBsAg
Mumtaz S et al 2002[4]	Islamic International Medical College Rawalpindi		6.21%	5.86%
Khattak MF et al 2002[5]	AFIT, Rawalpindi		4.0%	3.3%
Fayyaz KM et al 2002[6]	Quaid-e-Azam Medical College, Bahawalpur		--	7.53%

Ali et al2003[7]	CMH, Quetta		1.87%	--
Zaidi A et al 2004[8]	Hayatabad Medical Complex, Peshawar		1.34%	1.46%
Sirhindi GA et al2005[9]	Shaikh Zayed Postgraduate Medical Institute Lahore		4.16%	3.36%
Mehmood MA et al 2004[10]	Nishtar Medical College/Hospital Multan		0.27%	3.37%
Asif N et al2004[11]	Shifa International Hospital Islamabad		5.14%	2.51%
Ahmed J et al 2004[12]	Rehman Medical Institute Peshawar		2.2%	1.9%
Aziz MS 2006[13]	DHQ Hospital Skardu		1.1%	8.4%

4. DISCUSSION

National level estimates of the prevalence of hepatitis B and hepatitis C are currently not available. Some studies have been conducted in different institutes of the country as shown in table 2. Various studies[15-18] in Pakistan estimate the prevalence of exposure to HBV to be between 2.28% and 3.3% and HCV to be at 6 %, [5-9]. In the study of Ali et al. (2005), figures as high as 17% for HCV were reported[18]. Dual infection by both B and C were seen in 6% of cases. Overall there were more men with CLD than women (60% vs. 40%). In another study in Pakistan combined infection was seen in 8% of cases [19].

In a study on 18,202 blood donors using ELISA technique at Blood Transfusion Services, Pakistan Institute of Medical Sciences, Islamabad, 603 individuals (3.31%) were positive for anti HCV antibodies while 351 individuals (1.92%) showed positivity for HBsAg [19]. In this study the prevalence rate of HBV was low as compared to HCV. The authors claim that the reason might be the vaccination programs and increased public health awareness that lowered this rate. There is no screening method available to completely eradicate the risk of these Transfusion Transmitted Infections (TTIs) but proper screening and selection of donor before collection can minimize these TTIs. Majority of blood donations in our country are replacement or voluntary. Voluntary blood donors are safer source of blood supply and special emphasis must be given to increase this source to higher levels. Regarding modes of HBV and HCV transmission, awareness and education of donors is required. HBV and HCV positive donors should be permanently deferred for future donations and must be informed about their disease and referred to a physician.[20]

Although CLD is commonly caused by viral hepatitis in Pakistan, it may have some other relatively less common and potentially treatable etiology, including autoimmune liver disease, primary biliary cirrhosis, Wilson's disease and haemochromatosis. In rural Sindh 17% of all patients tested had evidence of exposure to HCV [17]. However, patients with CLD, who do not have evidence of exposure to either of the two viruses, have not yet been studied in this region. The purpose of this study was to find out the proportion of patients who had CLD but were negative for both hepatitis B and C viral markers and to compare the demographic features and mortality of this group of CLD, with those with a viral etiology.

A study shows that among 1,131 volunteer blood donors enrolled, 46 (4.1%) were positive for anti-HCV antibodies. Positive donors had a family history of jaundice and were more likely to have been shaved (facial and armpit) by barbers[20]. The transfusion of blood is a life-saving procedure and benefits thousands of patients worldwide. Serological testing of HBV and HCV is compulsory in blood banks routinely. Blood donors include the adult population in the 18-60 year age group, so the prevalence in other age groups is missed in such studies. But it is generally accepted that the evaluation of donor's blood for seropositivity of HBV and HCV gives an idea for the epidemiology of these infections in the general population[15].

Seroprevalence rate of HBsAg and anti HCV antibodies varies in different regions of Pakistan as shown in Table 2. The seroprevalence of HBV in healthy donors varies from 1.46% (HMC, Peshawar) to 8.4% (DHQ Hospital Skardu) in different parts of our country[13],[8]. The prevalence rate for HBS in our blood donors is 4.7%. In a study by Mahmood MA the prevalence rate was found to be 3.37%. The incidence reported from Multan was the lowest compared to various regions of Pakistan with an incidence of 4.8% for HCV.[10] Our finding shows that the prevalence of HBV in our population is higher than already reported incidence. The reason could be improvement in the method of detection. Similarly, the infection rate of HCV in various studies varies from 0.27% to 8.68% [11-18].

5. CONCLUSION

The findings of this work show that the incidence of HBs and HCV is very high in general population of southern Punjab. Our finding shows prevalence much higher than already reported. We believe that methodology adapted previously might

not be very accurate. So our data gives more reliable positivity rate for this region of the country.

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Authors Contribution

Concept & Design of Study: Madiha Rehman, Sidra Anwar,

Drafting: , Nasir Islam, Maryam Ejaz,

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Critical Review: Madiha Rehman, Sidra Anwar

Final Approval of version: All listed above , approved the final version.

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