

SEROPREVALENCE OF HEPATITIS B, HEPATITIS C AND HIV IN BLOOD DONORS OF PESHAWAR

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ABSTRACT

Background: Alarming seropositivity rates for Hepatitis B & C are reported for Asia. These diseases are of highest public health concern along with HIV. Transfusion of contaminated blood is an important cause of spread of hepatitis B & C in this region. The objective of this study was to determine the seroprevalence of hepatitis B, C and HIV among healthy blood donors bank and to determine whether the trend of seropositivity is on the decline as indicated by previous studies.

Material & Methods: This descriptive study is an analysis of database at Fatimid Foundation Blood Bank, Peshawar from years 2005 to 2008. Random sampling was employed whereby approximately 1000 subjects per year, irrespective of gender, were taken into consideration. The blood was screened at the Foundation's own testing facility.

Results: A total of 3915 donors were selected. Seroprevalence of hepatitis C was 0.89% (35) while that of Hepatitis B was 2.07% (81). No case of HIV was detected.

Conclusion: Mass screening programs such as one in this study are useful in identification of seropositive blood donors for hepatitis B, C and HIV and subsequent selection of healthy blood donors.

KEY WORDS: Blood transfusion, Blood donor, Hepatitis B, Hepatitis C.

INTRODUCTION

Hepatitis B & C are spread through blood and body secretions. Hepatitis signifies injury to the liver characterized by the presence of inflammatory cells. The condition can be self-limiting, healing on its own, or can progress to scarring of the liver.^{1,2} Hepatitis can also be due to toxins notably alcohol, other infections or from autoimmune process. It may run a subclinical course when the affected person may not feel ill. The patient becomes unwell and symptomatic when the disease impairs liver functions that include among other things, removal of harmful substances, regulation of blood composition, and production of bile to help digestion.

The fact that this may run a subclinical, asymptomatic course, keeps the patients unaware of its presence.

Seropositivity for HB_sAg and HCV antibodies is a concerning area of research inquiry in SAARC region for the last 10 years. While the health regulatory authorities in Pakistan have made it mandatory to screen all donated blood for hepatitis B, C and HIV, it is not being carried out properly.⁵ Several studies on blood donors from different regions of Pakistan has shown the seropositiv-

ity rates of 1.9 to 6.5% and 0.27% to 6.2% for hepatitis B and C respectively.⁶⁻¹⁰

MATERIAL AND METHODS

The research was carried in conjunction with the Fatimid Foundation Peshawar., Pakistan. Fatimid is a busy transfusion service serving a major portion of Peshawar, Pakistan, and patients from neighboring Afghanistan as well. Fatimid carries out more than 100 blood transfusions on site per day and provides more than 100 units of whole blood and Packed RBCs per day.

This is a retrospective review of existing database at Fatimid Blood Screening Laboratory. All incoming blood donations and prospective blood donors are screened for Hepatitis B, Hepatitis C and HIV in this laboratory. Systematic random sampling was employed to select individuals irrespective of age or gender. Blood donors were all voluntary and non-remunerated.

The sample size under consideration was 3915 individuals independent of their age/gender.

Screening method used for Hepatitis B and C was identification Hepatitis B Surface Antigen

and anti-HCV antibodies respectively. Tests were carried out on serum of donated blood or donors.

Screening was done using Abbott AxSym which is an immunochemical automated analyzer.

Geographic distribution of subjects was from areas adjacent to the city of Peshawar as well as adjoining areas including several villages within 50 mile radius of Peshawar.

The data was transferred to MS Excel 2007 datasheets by the investigators and subsequently analyzed for seropositivity rates of Hepatitis B and C and HIV. The database under examination included subjects from the years 2005, 2006, 2007 and 2008.

RESULTS

A total of 3915 lab reports for healthy blood donors from data for four years, 2005-2008 were included in the final analysis.

The total number of blood donors positive for Hepatitis B was 81 (2.07%). Their distribution according to donor blood groups is shown in Fig. 1.

The total number of blood donors positive for Hepatitis C was 35 (0.89%). Their distribution according to donor blood groups is shown in Fig. 2.

Four (0.102%) cases were reported positive for both Hepatitis B and C. There was one case each for the type A⁺, B⁺, AB⁺ and O⁺ while no dual seropositive cases were reported for Rhesus negative groups.

No cases of HIV were found in our study.

The seroprevalence of Hepatitis B and Hepatitis C has a declining temporal trend form 2005 to 2008, in our study. (Fig. 3)

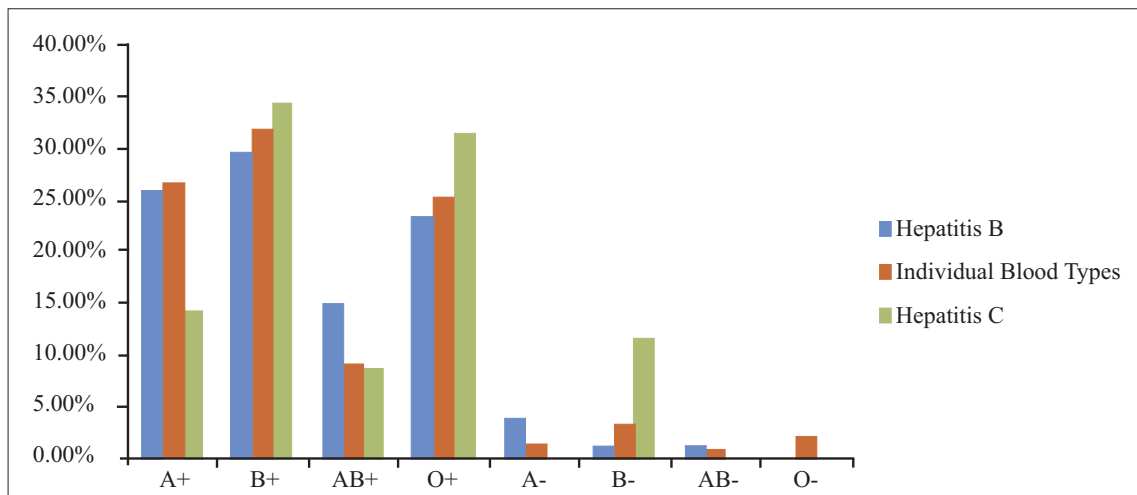


Fig. 1:

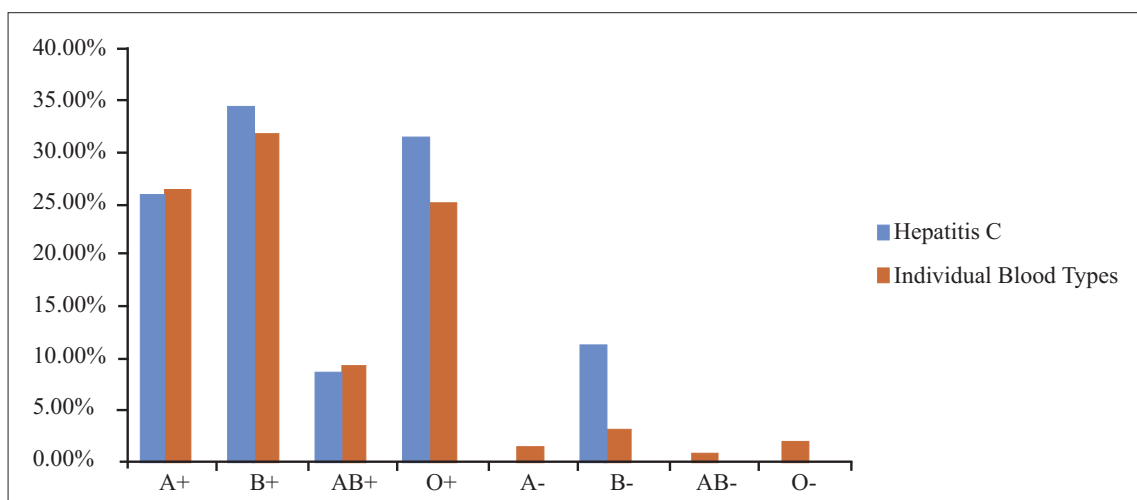


Fig. 2:

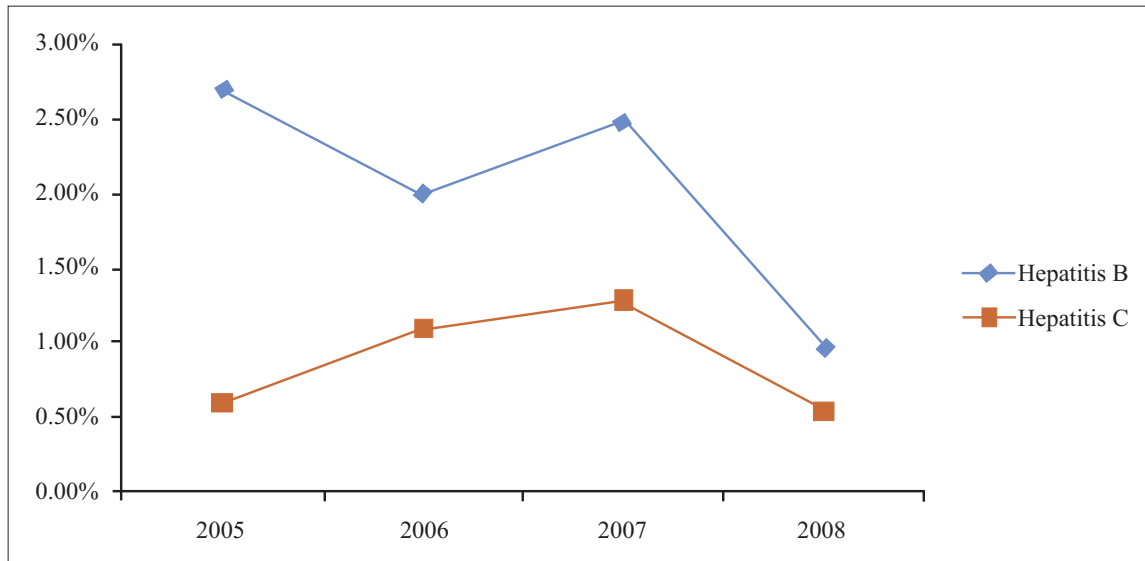


Fig. 3

DISCUSSION

The percentage of donors testing positive for Hepatitis B and C was found to be 2.96% with Hepatitis B accounted for 2.07% while Hepatitis C accounted for 0.89%.

Table 1 and 2 show the differential frequencies of seropositivity for Hepatitis B and C according to individual blood groups in our study population. Distribution of different blood groups in our sample is representative of the known blood group distribution in our part of the world, (REF). Looking at Graph 1, it is evident that the seroprevalence rates are also distributed according to the prevalence of individual blood groups. There is, however, a disproportionately high seropositivity both for Hepatitis B and C in donors having O(pos) blood type. An indirect explanation may be the fact that this is a "much wanted" blood type in a blood bank that may explain higher than normal population representative of this blood type. Another striking result is that of significantly high seropositivity for Hepatitis C in donors having B(neg) blood type. Rh negative blood group donors showed a 0% seropositivity for Hepatitis B or C, with the exception of B(neg) donors who showed a four times higher seropositive donor rate. Literature review did not yield sufficient information to support or discredit this finding.

Although a declining temporal trend is seen in our sample, seropositivity of Hepatitis B in blood donor population is on the rise as opposed to 2004 when Zaidi et al reported a seroprevalence rate of 1.40%.⁵ They also reported a seroprevalence rate of 1.75% for the same region for similar population in the period 1999-2003.⁵ Seroprevalence rate of Hepatitis C has however significantly

declined over the years to 0.89% according to our study as opposed to 1.34% and 2.60% for the period 1999-2003 as reported by Zaidi et al.⁵ The temporal trend for our study is shown in Graph 3.

It goes to show that the prevalence of Hepatitis B in apparently healthy blood donors in our study sample from Peshawar is lower when compared to other regions of the country like 1.55% from Abbottabad,⁹ 2.51% from Islamabad,⁷ 3.3% to 6.4% from Rawalpindi,⁷ 2.06% to 4.3% from Lahore,¹³ 7.53% from Bahawalpur,¹¹ 3.37% from Multan,¹ and 5.5% in healthy blood donors from Karachi. The highest seroprevalences of Hepatitis B is reported from Bahawalpur (7.53%),⁷ and Rawalpindi (6.4%).⁴

Seroprevalence of Hepatitis C is relatively lower in our study than in other studies done in Pakistan. Investigators have reported seroprevalence rates of 5.14% from Islamabad, 4% to 6.21% from Rawalpindi,⁶⁻⁸ 2.89% to 4.97% from Lahore,^{10,12,13} 3.26% from Sialkot,¹⁴ 0.27% from Multan³, 6.8% from Karachi⁴, and 1.87% from healthy blood donors screened in Quetta.¹⁵

Dual seropositivity for Hepatitis B and C was seen in 4 blood donors all belonging in the Rhesus positive blood groups. Total seropositivity rate for dual infection is 0.1% which suggests different epidemiologic factors govern infection with both the agents. However, studies have shown the incidence of Hepatitis C to be higher in donors who tested positive for Hepatitis B.¹⁶ A plausible explanation can be the assumption that these individuals were exposed to similar risk factors or engaged in similar high risk behaviors required for acquiring these infections.

Irrespective of what previous studies have shown, looking at the temporal trend in Table 3, it is clear that the number of cases of both Hepatitis B and C in healthy blood donors have declined considerably in the year 2008. While it is the authors' opinion that further studies are required to furnish suitable explanation for this decline, this trend is an indirect measure of increasing awareness level of our blood donors about their status of seropositivity for Hepatitis B and C. Hepatitis B and C screening is now performed for every hospitalized patient in public and private sector hospitals in Peshawar and prior to dental procedures. Blood donors who test positive for either Hepatitis B or C are counseled not to donate blood. With a big proportion of general population being aware of their own Hepatitis B or C seropositivity status and not donating blood anymore, the seropositivity in blood donors in our study population has declined. Though quite well thought out, this claim is an assumption of authors at best in absence of evidence of increased awareness of general public about their seropositivity from this region.

Results of a separate study in Peshawar region conducted in a different center (Hayatabad Medical Complex)⁵, was compared to data from the Combined Military Hospital, Peshawar.⁶ Blood donors screened at Hayatabad Medical Complex Hospital showed seropositivity of 1.40% and 1.34% for Hepatitis B and Hepatitis C respectively from 1999 to 2003. Screening of blood donors at Combined Military Hospital, Peshawar during the same period, detected 1.75% Hepatitis B and 2.60% Hepatitis C seropositive subjects. No HIV positive blood donor was detected in both studies. Riyas et al concluded a decreasing trend in the seroprevalence of viral Hepatitis (B & C) in the blood donor population of Northern Pakistan.⁸ Studies from Southern Pakistan, however, show an increased rate as well as increasing temporal trend for both Hepatitis B (5.7%) and Hepatitis C (7.2% in 2004 which increased significantly to 8.9% in 2007).

Seropositivity of Hepatitis B and C in blood donors show wide variations among different countries across the globe. We belong to the EMRO region of WHO. Egypt is one of our contemporaries in healthcare. Arthur et al have shown an alarming seropositivity in Egyptian blood donors. This study shows the seropositivity of Hepatitis C among blood donors to be 24.8% while that of Hepatitis B was 39.4%.¹⁶ They had a larger sample size and study was done in a larger geographic area as well. In comparison to Egypt, blood donor population in our study has a significantly low seropositivity rate.

Comparing our result with other SAARC countries, we found that our next door neighbor, India showed a cumulative seropositivity rate of 0.62% in healthy blood donors in Karnataka, India.²² Another SAARC country, Nepal has reported seropositivity of 0.92% for Hepatitis B and 0.71% for Hepatitis C in Khatmandu.²¹

Sonsilvilai et al reported a seropositivity of 5.6% for Hepatitis C in healthy blood donors in Thailand.¹⁷ This high rate was gender adjusted by them to 3.7% in the same study. Suleiman et al did a similar study in Indonesia and reported a seropositivity of 2.1% and 8.8% for Hepatitis C and B respectively for healthy blood donors.¹⁸

Results of similar studies from several European countries were reviewed and it was generally agreed that seropositivity of Hepatitis B and C is lower in Europe when compared with Asia or Africa. Guroi et al reported a seropositivity of 2.1% and 0.34% for Hepatitis B and C respectively from Turkey.²⁰ High seropositivity was seen in study by Alao et al from Nigeria showing a seropositivity of 5.4% for Hepatitis C¹⁹, and by Nwakedi et al from Nigeria reporting seropositivity of 23% for Hepatitis B.²³ Nwakedi study, however was done in hospital patients who incidentally tested positive for Hepatitis B.

CONCLUSION

Seropositive blood donors remain an ever present threat to the practice of "Safe Blood Transfusion" throughout the world. This threat is even more acute in our set up considering lack of public awareness, increased risk of transfusing un-screened blood due to lack of universal screening programs funded by government for better control or transmission.

We recommend further studies along same lines with bigger sample sizes and broader geographic catchment areas to confirm and improve upon our results. Prospective enrollment of all blood donors with electronic records is an urgent need of the day.

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