

Accidental Diagnosis of Infections among Blood Donors

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Abstract

Introduction: Due to widespread incidence and prevalence, human immunodeficiency virus (HIV), hepatitis B (HBV) and C (HCV), syphilis and malaria are the most common viral infections transmitted via blood transfusions. Yet there is insufficient information available about the exact prevalence of these infections among blood donors in Pakistan. The objectives of current study are to highlight the importance of blood screening among blood donors by finding the prevalence of high-risk transmissible diseases such as hepatitis B, hepatitis C, HIV, syphilis and malaria in the population of Nawabshah (Sindh) and to compare it with other provinces. **Methods:** A descriptive type of cross-sectional study was conducted on 37,845 blood donor volunteers at the blood bank of a tertiary care hospital, Peoples University of Medical and Health Sciences Hospital, in Nawabshah Sindh from 1st January 2018 to 31st December 2018. The data was taken from the well-maintained yearly record of the hospital blood bank. Analysis of all the data regarding blood donors was done using Statistical Program of Special Sciences (SPSS) version 20. **Results:** The most common age group was between 18 - 40 years. Donors were predominantly male (90%). HBV is the most prevalent disease amongst the blood donors of Peoples Medical College with a prevalence of 6.52% while HIV, HCV and malaria were 6.33%, 5.83% and 1.24% respectively whereas Syphilis is the least prevalent disease with a prevalence of 1.11%. Comparing with other provinces, the highest prevalence of hepatitis B was seen in Peoples Medical College, Nawabshah, Sindh whereas for hepatitis C it was the highest in Isra University Hospital, Hyderabad, Sindh. Moreover, Hayatabad Medical Complex in Peshawar was the least burdened with Hepatitis B (1.46%) and C (1.34%). **Conclusion:** Accidental diagnosis of blood-borne infections including Hepatitis B, C, HIV, Syphilis and malaria highlights importance of blood screening among the blood donors. There is a need of public education regarding infection prevention and transmission.

Keywords

Blood Donors, Infectious Diseases, Hepatitis B, Hepatitis C

1. Introduction

A vital part of every health care system (Primary, Secondary and tertiary) is blood donation. Blood donation is an indispensable measure for all patients who require transfusion of blood during the disease stage or in emergency situations. Any person who is willing for donating blood without any urge of demand or anything in return is known as a voluntary blood donor. It is a social duty and a great contribution towards community and humanity as it guarantees a continuous supply of blood even if it is as a replacement donor. However, concerned administrative authorities are involved directly in the provision of safe blood supply to control the diseases transmitted by blood transfusion. Due to widespread incidence and prevalence, human immunodeficiency virus (HIV), hepatitis B (HBV) and C (HCV), syphilis and malaria are the most common viral infections transmitted via blood transfusions.

HIV is a virus that leads to many diseases related to immune system; acquired immunodeficiency syndrome (AIDS) has life threatening repercussions. HBV and HCV are amongst the top precipitating factors of liver cirrhosis, carcinoma and end stage liver disease. As stated by the World Health Organization (WHO) about 350 million people have long-standing HBV infection, about 170 million people have persistent HCV infection and 36.9 million people suffer from HIV worldwide [1] [2] [3]. Annually, 663,000, 399,000 and 940,000 deaths occur as a consequence of hepatitis B, hepatitis C and HIV respectively [4].

Pakistan has one of the world's highest fertility rates, with more than four children per woman. On account of its large and ever-increasing population in addition to high rates of infection, Pakistan is significantly burdened with these diseases [1] [2]. Yet there is insufficient information available about the exact prevalence of hepatitis B, hepatitis C, HIV, malaria and syphilis among blood donors in Pakistan. The objectives of current study are to highlight the importance of blood screening among blood donors by finding the prevalence of high-risk transmissible diseases such as hepatitis B, hepatitis C, HIV, syphilis and malaria in the population of Nawabshah (Sindh) and to compare it with other provinces.

2. Methods

A descriptive type of cross-sectional study was conducted on 37,845 blood donor volunteers at the blood bank of a tertiary care hospital, Peoples University of Medical and Health Sciences Hospital, in Nawabshah Sindh. The blood donor's data regarding demographic variables and screening test for HBV, HCV, HIV, syphilis and malaria was collected from 1st January 2018 to 31st December 2018.

The data was taken from the well-maintained yearly record of the hospital blood bank. As per SOPs of hospital all the blood donors were healthy on the record of history and physical examination, for blood donation. Study got approval from the Ethical review committee of Peoples University of Medical and Health Sciences.

Analysis of all the data regarding blood donors was done using Statistical Program of Special Sciences (SPSS) version 20. Frequencies and percentages were used to present the qualitative data. The prevalence of all the screened diseases among donors was calculated while the prevalence of hepatitis B and C was compared with other studies done in different cities of Pakistan.

3. Results

A prospective study was carried out in Peoples Medical College Hospital, Nawabshah from January 2018 to December 2018. The total donors were 37,845. Their age was between 18 - 40 years. Donors were predominantly male (90%). HBV is the most prevalent disease amongst the blood donors of Peoples Medical College with a prevalence of 6.52% whereas Syphilis is the least prevalent disease with a prevalence of 1.11% as mentioned in **Table 1**.

Highest prevalence of Hepatitis B (6.52%) was seen in Peoples Medical College, Nawabshah, Sindh whereas for Hepatitis C it was highest in Isra University Hospital, Hyderabad, Sindh. Moreover, Hayatabad Medical Complex in Peshawar was the least burdened with Hepatitis B (1.46%) and C (1.34%) as mentioned in **Table 2**.

4. Discussion

In this study, we compared seroprevalence of HBV and HCV in healthy blood donors of People's Medical College, Nawabshah, Sindh with the different hospitals from different provinces. Hepatitis and HIV, similar to other blood borne illnesses, are transmitted sporadically-microepidemics. To curb the transmission of HBV and HCV we must identify the causes of these microepidemics. [18] [19] The variation in seroprevalence amidst comparable regions or populations can be a consequence of methodological differences in sampling strategies.

As reported earlier, Nawabshah appears to be plagued by Hepatitis B to the greatest extent that is 6.52%. If we compare this data with that of Western

Table 1. Prevalence of different diseases for which blood was screened.

	Prevalence (%)	n = 37,845
HIV	6.33	2389
HBV	6.52	2466
HCV	5.83	2208
Syphilis	1.11	421
Malaria	1.24	471

Table 2. Prevalence of Hepatitis B and C among blood donors reported in the last few years in different cities of Pakistan.

Province	City	Place of Research	Time of study	HBsAg (%)	Anti-HCV (%)
Sindh	Karachi [5]	Baqai Medical University	2007	4.5	4.36
	Karachi [6]	Baqai Medical University, PNS Shifa	2008	1.71	2.06
	Hyderabad [7]	Isra University Hospital	2006	3.65	8.68
	Nawabshah (Current Study)	Peoples Medical College	2018	6.52	5.83
	Rawalpindi [8]	AFIT	2002	3.3	4.0
	Rawalpindi [9]	Islamic International College	2002	5.86	6.21
Punjab	Rawalpindi [10]	Fauji Foundation Hospital	2006	2.45	2.52
	Lahore [11]	Shaikh Zayed Postgraduate Medical Institute	2005	3.36	4.16
	Lahore [12]	Ghurki Trust Teaching Hospital	2007	1.52	5.34
	Lahore [13]	Nawaz Sharif Social Security Hospital	2009	1.70	7.69
	Bahawalpur [14]	Quaid-e-Azam Medical College	2006	2.69	2.52
Balochistan	Islamabad [15]	Shifa International Hospital	2004	2.51	5.14
	Quetta [16]	CMH	2003	-	1.87
KPK	Peshawar [17]	Hayatabad Medical Complex	2004	1.46	1.34

Europe and United States of America, we can conclude that the burden of HBV infection is lower there (0.1% - 0.5%) [20]. There are several reasons for this. WHO reports that in Southeast Asia an average person receives nearly four injections per year, mostly unnecessary [21]. Such injections play a crucial role in the spread of HBV and HCV. Other causes include sexual transmission, recipients of infected blood, occupational hazards to health workers and IV drug abusers.

In Sindh, Nawabshah bears majority of the brunt of HBV and HCV infections as opposed to Karachi. In Baqai Medical College, Karachi the prevalence of HBV has dropped from 4.5% to 1.71% and that of HCV from 4.36% to 2.06% over a period of one year (2007-2008). This difference could be because of increased screening of blood, education of sex workers regarding condom use, better disposal of contaminated needles, increased awareness about the risks of unnecessary injections. On the contrary, HBV and HCV infections have a prevalence of 1.46% and 1.34% respectively in KPK which is much less compared to other cities of Pakistan. In KPK, both military personnel and civilians made up the donor population. Life style of those in armed forces and civilians is poles apart; closed community living, barracks, almost uniform working environment and same health facilities. The disparity observed between their seroprevalence rate can be possibly attributed to these reasons [22].

In Pakistan, the seroprevalence of HBV and HCV is high amongst healthy donors of blood. Hence, infected people need to be identified to prevent further transmission and complications. Multiple researchers have identified a few key elements of utmost importance in aiding spread of HBV and HCV; unscreened

blood transfusion, reuse of unsterilized syringes and medical equipment. That being the case, proper disposal of contaminated needles, condom use, apt screening of blood before donation as well as transfusion and vaccination against Hepatitis B should be encouraged. Looking over the other screened infections including HIV, Syphilis and malaria, none of the study has yet reported their prevalence among blood donors in Pakistan. Limitation of the current study is that data should be collected on large scale.

5. Conclusion

Accidental diagnosis of blood-borne infections including Hepatitis B, C, HIV, Syphilis and malaria highlights the importance of blood screening among the blood donors. There is a need for public education regarding infection prevention and transmission.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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