ORIGINAL ARTICLE

SEROPOSITIVITY FOR HEPATITIS B AND C IN VOLUNTARY BLOOD DONORS

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Background: After the introduction of blood banks and better storage techniques blood is more widely used in patients for various indications. In Pakistan more than 1.5 million pints of blood are collected each year. Hepatitis B and C virus infections are known to occur in the general population and due to their mode of transmission through blood and blood products, it has made safe blood transfusion difficult and screening of blood absolutely necessary. Objectives of this study were to estimate frequency of Hepatitis B and C in blood donors of local area and recommend measures for safe blood transfusion. **Methods:** This retrospective cross-sectional study was conduced at the Blood Bank, Department of Pathology, Khyber Teaching Hospital, Peshawar from 1st January 2007 to 31st December 2008. It was carried out on 32,042 voluntary, non-remunerated healthy blood donors. They were screened for Hepatitis B surface antigen (HBsAg) and anti-hepatitis C antibodies (anti-HCV antibodies) by ELISA. The patients' age ranged from 18–52 years. They were all males. **Results**: Out of 32,042 donors, 632 (1.97%) patients were positive for HBsAg, and 502 (1.57%) were positive for anti-HCV antibodies. **Conclusion**: Incidence of Hepatitis B and C is varying in different areas. It is recommended that properly screened blood only, using a reliable method like ELISA, be transfused to the patients.

Keywords: HBsAg, HCV, ELISA, blood donors, blood transfusion

INTRODUCTION

Blood has been used since 1930 for various indications.[1] After the introduction of blood banks and better storage techniques it is widely used in patients. In Pakistan more than 1.5 million pints of blood are collected each year.[2,3]

The Hepatitis B and C virus infections are known to occur in the general population and due to their mode of transmission through blood and blood products, it has made the provision of safe blood difficult, and the screening of blood absolutely necessary.[4] Hepatitis B and C are highly infectious and pose major public health problem worldwide. The problem in developing countries has increased by the poor economical status of the patients who are made to afford the costly therapy.[5] Hepatitis B is one of the most common infectious diseases of the world and has infected 2 billion people worldwide including an estimated 400 million chronically infected cases.[6] It is hyperendemic in sub-Saharan Africa and Asia.[7,8] Individuals with chronic infection have a high risk of liver cirrhosis and hepatocellular carcinoma.[9]

There are estimated 170 million HCV carriers worldwide, most of them are thought to be in the developing countries.[10] HCV plays an important role in the causation of chronic liver diseases[11] and has become the leading cause of liver cirrhosis and primary liver cell carcinoma in North America, Southern Europe and Japan.[12,13]

The safety of blood and its products has gained tremendous importance since the documentation of blood born viral infections in regularly transfused patients. These may be thallasaemic children, oncology patients or aplastic anaemia patients.[14] Detection of hepatitis B surface antigen (HBsAg) in blood is diagnostic for infection with HBV and in blood bank screening for HBsAg is carried out routinely to detect HBV infection.[9] Similarly antibodies to hepatitis C virus (anti-HCV) are used to detect HCV infection.[15]

Safe blood transfusion is the term which refers to judicial and rational therapeutic use of blood and blood products. World Health Organization (WHO) recommendation of safe blood transfusion is provision of compatible blood which are cross matched and screened at least for five WHO recommended transfusion transmitted infections, human immunodeficiency virus (HIV), hepatitis C (HCV), hepatitis B (HBV), syphilis and malarial parasite.[16] Objectives of this study were to estimate frequency of Hepatitis B and C in blood donors of local area and recommend measures for safe blood transfusion.

PATIENTS AND METHODS

This retrospective study was carried out at Khyber Teaching Hospital Peshawar from 1st January 2007 to 31st December 2008. All blood donors were registered with name, age, weight etc. All blood donors were males ranging from 18–52 years. They were thoroughly examined and a detailed history was taken by the medical officer. Haemoglobin estimation of each donor was done. All donors were having weight more than 50 Kg and haemoglobin more than 12 g/dl. The persons with previous history of viral hepatitis, drug abuse, previous blood or blood components transfusion in last

one year, any evidence of cardiac, renal or pulmonary disease were excluded from the study. Blood was taken from each patient, serum was prepared and tested for HBsAg and anti-HCV antibodies by ELISA.

RESULTS

The blood donors screened during the study period were 32,042. All donors were males with age range 18–52 years. This study was carried out in two years (2007–2008). The HBsAg positive cases were 632 (1.97%) and HCV positive were 502 (1.57%). (Tables-1 and 2).

Table-1: Month-wise tests done during 2007

2007	Total HBsAg	Positive HBsAg	Negative HBsAg	Total HCV	Positive HCV	Negative HCV
Jan	1,137	21	1,116	1,137	22	1,115
Feb	1,156	28	1,128	1,156	19	1,137
Mar	1,336	18	1,318	1,336	14	1,322
Apr	1,278	22	1,256	1,278	17	1,261
May	1,617	31	1,586	1,617	24	1,593
Jun	1,436	30	1,406	1,436	22	1,414
Jul	1,496	31	1,465	1,496	23	1,473
Aug	1,530	30	1,500	1,530	42	1,488
Sep	1,102	23	1,079	1,102	14	1,088
Oct	1,308	29	1,279	1,308	22	1,286
Nov	1,608	40	1,586	1,608	20	1,588
Dec	1,264	21	1,243	1,264	23	1,241
Total	**16,266**	**324**	**15,962**	**16,268**	**262**	**16,006**

Table-2: Month-wise tests done during 2008

2008	Total HBsAg	Positive HBsAg	Negative HBsAg	Total HCV	Positive HCV	Negative HCV
Jan	1,451	23	1,428	1,451	23	1,428
Feb	1,276	20	1,256	1,276	18	1,258
Mar	1,524	40	1,484	1,524	26	1,498
Apr	1,585	38	1,547	1,585	31	1,554
May	1,625	30	1,595	1,625	35	1,590
Jun	1,418	14	1,404	1,418	21	1,397
Jul	1,336	30	1,306	1,336	12	1,324
Aug	1,381	26	1,355	1,381	18	1,363
Sep	1,000	24	976	1,000	16	984
Oct	1,499	25	1,474	1,499	19	1,480
Nov	1,609	20	1,589	1,609	09	1,600
Dec	1,305	18	1,287	1,305	12	1,293
Total	**17,009**	**308**	**16,701**	**17,009**	**240**	**16,769**

DISCUSSION

Our study was aimed at determining the seroprevalence of HBV and HCV infection among voluntary blood donors. The best way of getting the safest blood for patients is proper donor selection and proper screening of blood.

Table-3 shows variation in the range of Hepatitis B prevalence in Pakistan from 1.46% (HMC Peshawar) to 8.4% (DHQ Hospital Skardu), and Hepatitis C prevalence from 0.27% (Nishtar Medical College Multan) to 8.68% (Isra University Hospital Hyderabad). In our study the prevalence of Hepatitis B is 1.97% and of Hepatitis C is 1.57%.

Seroprevalence rate of HBsAg and anti-HCV varies in different countries. Prevalence of HBsAg was found as 3.4% in Georgia, 1.5% in Kingdom of Saudi Arabia, 4.3% in Egypt, 1.38% in Turkey, 0.82% in Nepal and 3.3% in Brazil.[17–21] On the other hand, the anti-HCV antibodies prevalence rate in same countries was found to be 6.9%, 0.4%, 2.7%, 0.35%, 0.47%, and 5.9% respectively.

In our study the prevalence of Hepatitis C is less as compared to Hepatitis B. This is probably due to developing public awareness about these , care of not sharing the razors, use of disposable syringes and proper screening of blood and blood products.

Table-3: Prevalence of Hepatitis B & C among healthy blood donors reported in the last few years in different cities of Pakistan

Author & Year	Place of Study	Anti-HCV	HBsAg
Khattak MF *et al* 2002[22]	AFIT, Rawalpindi	4.0%	3.3%
Mumtaz S *et al* 2002[23]	Islamic International Medical College Rawalpindi	6.21%	5.86%
Fayyaz KM *et al* 2002[24]	Quaid-e-Azam Medical College, Bahawalpur	--	7.53%
Ali N *et al* 2003[25]	CMH, Quetta	1.87%	--
Zaidi A *et al* 2004[26]	Hayatabad Medical Complex, Peshawar	1.34%	1.46%
Mehmood MA *et al* 2004[27]	Nishtar Medical College/ Hospital Multan	0.27%	3.37%
Asif N *et al* 2004[28]	Shifa International Hospital Islamabad	5.14%	2.51%
Ahmed J *et al* 2004[29]	Rehman Medical Institute Peshawar	2.2%	1.9%
Sirhindi GA *et al* 2005[30]	Shaikh Zayed Postgraduate Medical Institute Lahore	4.16%	3.36%
Ujjan ID *et al* 2006[31]	Isra University Hospital, Hyderabad	8.68%	3.65%
Aziz MS 2006[32]	DHQ Hospital Skardu	1.1%	8.4%
Azam M *et al* 2007[33]	Baqai Medical University, Karachi	4.36%	4.5%
Ijaz AU *et al* 2007[34]	Ghurki Trust Teaching Hospital, Lahore	5.34%	1.52%
Chaudhary IA *et al* 2006[35]	Fauji Foundation Hospital Rawalpindi	2.52%	2.45%s
Present study	Khyber Teaching Hospital Peshawar	1.57%	1.97%

CONCLUSION

The incidence of Hepatitis B and C is comparable to others from the same location and is slightly better than other areas of Pakistan. Unfortunately blood transfusion services are not well organised in Pakistan. We recommendations the following:

- Proper screening of blood and blood products for Hepatitis B and C infections with ELISA to avoid false negative results. No surgical procedures should be carried out without prior screening of the patients.
- The masses should be educated about hepatitis and other viral infections.
- Professional donors should be discouraged.

REFERENCES

1. Zafar N. Survey of blood transfusion practices. J Coll Physicians Surg Pak 2000;10(3):90–2.
2. Asif N, Kokhar N, Ilahi F. Seroprevalence of HBV and HCV and HIV infection among voluntary non remunerated and replacement donors in Northern Pakistan. Pak J Med Sci 2004;20(1):24–8.
3. Mujeeb SA. Single unit blood transfusion, a bad clinical practice. Transfus Today 1997;36:5–7.
4. Olokoba AB, Salau FK, Danburam A, Desalu OO, Olokoba LB, Wahab KW, *et al*. Viral hepatitides in voluntary blood donors. Eur J Sci Res 2009;31:329–34.
5. Waheed U, Abbas H, Naseem L, Hasan K. Study of Hepatitis B and C virus seropositivity in healthy blood donors. Ann Pak Inst Med Sci 2009;5:233–6.
6. Schreiber GB, Busch MP, Kleinman SH, Korelitz JJ. The risk of transfusion transmitted viral infections. The retrovirus epidemiology donor study. N Engl J Med 1996;334:1685–90.
7. Gashau W. Muhammad I. Hepatitis B virus markers in Nigerian patients with primary liver cell carcinoma. Trop Geogr Med 1991;43:64–7.
8. Isselbacher KJ, Wands JR. Neoplasm of the liver. In: Harrison's principles of internal medicine. Wilson JD, Braunwald E, Isselbacher K *et al* (eds). 12th Ed. New York: McGraw Hill; 1991.p.1350–2.
9. Bhattacharya P, Chandra PK, Datta S, Banerjee A, Chakraborty S, Rajendran K *et al*, Significant increase in HBV,HCV,HIV and Syphilis among blood donors in west Bengal, Eastern India. World J Gastroenterol 2007;13:3730–3.
10. Maddava V, Burgess C, Drucker E, Epidemiology of chronic hepatitis co-infection in sub-Saharan Africa. Lancet Infect Dis 2002;2:293–302.
11. Lesi OA, Kehinde MO, Anomneza EE, Wali SS. Hepatitis C infection and the risk of chronic liver disease in Lagos. Nig Q J Hosp Med 2002;12:1–4.
12. Colquhon SD. Hepatitis C: A clinical update. Arch Surg 1996;131:18–23.
13. Chen DS. Hepatitis C virus in chronic liver disease and hepatocellular carcinoma in Taiwan. Princess Takamatsu Symp 1995;25:27–32.
14. Naseem L, Haq A. Predonation testing of the potential blood donors- A pilot study at a tertiary care hospital. Int J Pathol 2009;7(1):25–30.
15. Olokoba AB, Olokoba LB, Salawu FK, Danburam A, Desalu OO, Midala J, *et al*. Hepatitis C virus and Human Immunodeficiency virus co-infection in North Eastern Niger Res J Med Sci 2008;2:217–9.
16. Dipta TF, Md. Rahman T. Safe blood transfusion: past, present and future. Bangladesh J Pathol 2009;24(1):1–2.
17. Butsashvili M, Tsertsvadze T, McNutt LA, Kamkamidze G, Gvetadze R, Badridze N. Prevalence of hepatitis B, hepatitis C, syphilis and HIV in Georgian blood donors. Eur J Epidemiol 2001;17:693–5.
18. El-Hazmi MM. Prevalence of HBV, HIV–1, 2 and HTLV1/3 infections among blood donors in a tertiary hospital in the central region of Saudi Arabia. Saudi Med J 2004;25:26–33.
19. El-Gilany AH, El-Fidawy S. Blood born infections among student voluntary blood in Mansoura University, Egypt. East Mediterr Health J 2006;12:742–8.
20. Afsar I, Gungor S, Sener Ag, Yurtsever SG. The prevalence of HBV, HCV and HIV infections among blood donors in Lzmir, Turkey, Indian J Med Microbiol 2008;26:288–9.
21. Braga WS, Silva EB, Souza RA, Tosta CE. Seroprevalence of hepatitis B and malaria infection in Labrea, Brazilian western Amazon: estimates of coinfection rates. Rev Soc Bras Med Trop 2005;38(3):218–23.
22. Khattak MF, Salamat N, Bhatti FA, Qureshi TZ, Kh. Seroprevalence of hepatitis B, Cand HIV in blood donors in northern Pakistan. J Pak Med Assoc 2002;52(9):398–402.
23. Mumtaz S, Rehman MU, Muzaffar M, Hassan MU, Iqbal W. Frequency of seropositive blood donors for hepatitis B,C and HIV viruses in Railway hospital Rawalpindi. Pak J Med Res 2002;41(2):51–3.
24. Fayyaz KM, Ali S, Khan AA, Shafique M, Majeed S. Hepatitis B carrier among volunteer blood donor students at Quid-i-Azam Medical college Bahawalpur. Professional Med J 2002;9(3):186–90.
25. Ali N, Nadeem M, Qamar A, Qureshi AH, Ejaz A. Frequency of hepatitis C virus antibodies in blood donors in Combined Military Hospital Quetta. Pak J Med Sci 2003;19(1):41–4.
26. Zaidi A, Tariq WUZ, Haider KA, Sattar A, Faqeer F, Rehman SU. Seroprevalence of hepatitis B, C and HIV in healthy blood donors in Northwest of Pakistan. Pak J Pathol 2004;15(1):11–6.
27. Mehmood MA, Khawar S, Anjum H, Ahmad SM, Rafique S, Nazir I. Prevalence of hepatitis B, C and HIV infection in blood donors of Multan region. Ann King Edward Med Coll 2004;10(4):459–61.
28. Asif N, Khokar N, Ilahi f. Seroprevalence of HBV, HCV and HIV infection among voluntary non-remunerated and replacement donors in Northern Pakistan, Pak J Med Sci 2004;20(1):24–8.
29. Ahmad J, Taj AS, Rahim A, Shah A, Rehman M. Frequency of Hepatitis B and Hepatitis C in healthy blood donors of NWFP. A single center experience. J postgrad Med Inst 2004;18(3):343–52.
30. Ahmed Z, Naeem MS, Shah WH, Hussain A Chohan RA. Frequency of Hepatitis B, C and Human Immunodeficiency Virus in blood donors at Sheikh Zayed Hospital, Lahore. Proceeding Sheikh Zayed Postgrad Med Inst 2005;19(1):33–6.
31. Ujjan ID, Memon RA, Butt AR, Sheikh IA, Khokar GN, Yousafani GM, Farooq M. Seroprevalence of HBsAg and anti-HCV in healthy blood donors Pak J Gastroenterol 2006;20(1):75–7.
32. Aziz MS. Prevalence of anti Hepatitis C antibodies and Hepatitis B surface antigen in healthy blood donors in Baltistan. Pak Armed Forces Med J 2006;56(2):189–91.
33. Azam M, Jamal N, Imtiaz F, Haque Z, Ayoob Z. Blood donor screening for hepatitis and HIV. J Dow Univ Health Sci 2007;1(2):82–3.
34. Ijaz AU, Shafiq F, Toosi NA, Malik MN, Qadeer R. Hepatitis B and Hepatitis C in blood donors: Analysis of 2-years data. Ann king Edward Med Coll 2007;13(1):59–61.
35. Chaudhary IA, Ullah S, Khan SS, Masood R, Sardar MA, Malhi AA. Seroprevalence of Hepatitis B and C among the healthy blood donors at Fauji Foundation hospital, Rawalpindi. Pak J Med Sci 2007;23(1):64–7.

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