

ORIGINAL RESEARCH



Life Science Journal of Pakistan
<http://www.lifesciencejournal.pk>

Incidences of HBV infection among pre-operative patients of elective surgeries in Tehsil Dargai Malakand KPK, Pakistan

Abdullah ^{1*}, Attaullah ², Latif Ullah ³, Faheem Anwar ⁴, Misbahud Din ⁵, Sikander Khan Sherwani ⁶, Munib Ahmad ⁷

¹Department of Biotechnology, Abdul Wali Khan University, Mardan, Pakistan

²Center for Human Genetics, Hazara University Mansehra, Pakistan.

³Department of Zoology, Hazara University Mansehra, Pakistan

⁴Department of Genetics Hazara University Mansehra

⁵Department of Biotechnology, Quaid-i-Azam University, Islamabad 44000, Pakistan

⁶Department of Microbiology, FUUAST Karachi Pakistan

⁷Department of Developmental Biology Shandong Normal University Jinan, China.

*Corresponding author:

Abdullah

Address: Department of Biotechnology, Abdul Wali Khan University, Mardan, Pakistan

Email: abdullah4us.71@gmail.com

ABSTRACT

Background: Hepatitis is a deadly liver disease caused by the hepatitis virus (HBV) it is considered the 10th leading cause of death worldwide (WHO) and about 350 million people worldwide suffer from chronic HBV infection. Viral hepatitis is an infectious disease that can transmit from one individual to another individual through blood transfusion, parental routes, and contaminated body fluids like saliva, semen, and blood.

Methodology: In the present study the targeted patients were screened for HBV infection through ICT (Immune Chromatographic Technique) method and the ICT positive cases were confirmed through the ELISA technique.

Results: A total of 4500 patients were included in this study, out of which 110 cases were found positive for HBV infection. The frequency of Hepatitis B infection was 110 (1.8%) of the total population in the registered patients. The highest ratio of prevalence was found in the age group of 41-60 years (45%). On gender-based study, the infection rate was found higher in males 75 (68.1%) as compared to females 35 (31.8%). The history of the patient's previous surgeries and disease records were also taken. The highest ratio of positivity was found 64 (58.1%) in patients having a blood transfusion in past, followed by previous surgeries 30 (27.2%), dental procedures 10 (9%) and Jaundice was present 6 (5.4%) in seropositive of HBV Patients

Conclusion: The prevalence of HBV infection is very high in hospitalized patients; it might be due to improper screening before surgery. The reason may be the use of non-sterilized surgical instruments, blood products, and lack of untrained staff.

Keywords: hepatitis B virus, prevalence of HBV, HBV Malakand

Life Sci J Pak 2020; 2(01):07-12. doi:10

(Received 01 April 2020 – Accepted 23 April 2020 – Published July 12, 2020)

Copyright © 2020 Zeb et al. This is an open-access article distributed under the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Hepatitis B virus is a member of the *hepadnaviridae* family, belongs to a class of enveloped viruses that cause chronic hepatitis (1). Hepatitis B virus (HBV) infection is a major public health issue globally, with problems linked with HBV in chronically infected people accounting for

approximately 600 000 deaths per year (2,3). According to global approximation, 350-400 million people are at risk from hepatitis B virus, in this calculation, about 80% are Asians (4,5). HBV infection is common in countries of Southeast Asia with moderate to high risk of infection in other parts of the world (6). In North America and Europe, the

prevalence of HBV virus is about 1/1000 of the total population (5). Every year about 10 to 30 million people are infected with HBV worldwide, the majority are children and young people (7). Around 2 billion people in developing countries including Africa and Asia have signs of current or past HBV infection (8). And about 15-25% of these individuals die each year from chronic liver infections. The primary source for inadequate HBV management in developing countries is socioeconomic factors and less developed health care systems (9).

In Pakistan, about seven to nine million people are infected with HBV and its ratio of the infection is steadily increasing. (10,11,12). The prevalence of HBV infection in KPK Mardan in selected parts of the country was found to be 1.05% and 1.13% among the general population. (13,14). HBV transmission occurs through the mucous membrane, blood transfusion, non-sterilized surgical instruments, injections of medications, injuries from sharp edges of the instrument, sexual contact, and chronically contaminated household contact. The main routes of transmission are secretions, body fluids, and contaminated blood (15,16). It cannot transmit through water, food, and accidental contact. The protocol for the diagnosis procedure of HBV infection is based on biochemical, clinical, serological, and histological findings (17). The study was aimed to determine the incidence of HBV among preoperative patients at Tehsil Dargai Khyber Pakhtunkhwa Pakistan and also the risk factors associated with HBV infection among the current study individuals.

MATERIALS AND METHODS

The blood sample was collected from the pre-operative patients who were undergoing surgeries in tehsil Dargai district Malakand by well-trained lab technicians of Talha Clinical Laboratory Dargai Malakand. A total of 4500 patients was registered and screened for HBV infection from January 2019 to December 2019. All the patients were screened for HBV infection by the immune - chromatography technique (ICT) method. Those patients who were found positive for HBV through ICT methods were further confirmed by Enzyme-Linked Immunosorbent Assay (ELISA).

Exclusion and inclusion criteria

Individuals of all ages undergoing surgeries, having no previous history of HBV infection were

included in the study, while individuals having a previous history of HBV infection, have vaccinations, attending the health setups, and not undergoing surgeries were excluded from the study.

Immune-Chromatography Technique (ICT)

For the detection of HBV in preoperative patients, initial screening was done through immune chromatographic technique. During the screening process initially, blood samples of the targeted individuals were centrifuged at 3000rpm for 3 minutes to separate the serum from plasma (SD® HBV).

The kit was used for screening HBV infection in the study population. The test strip is labeled with two alphabets "T" and "C". T means test line and C means the control line. Hundred microliter serums were added to the test kit and the result was observed after 15 minutes. When only C line appears, it means that the result is negative i.e. the patient has no HBV infection. If both if the line also appears in front of T it means that the result is positive i.e. the patient has HBV infection.

Enzyme-linked immunosorbent assay (ELISA)

The positive results were confirmed by using ELISA. This procedure was one through a semiautomatic machine (mini Vidas). The required reagents were removed from the refrigerator and allowed them to come to room temperature for at least 30 minutes. One "HBS" strip and one "HBS" SPR for each sample was kept in mini Vidas. The test was identified by the "HBS" code on the instrument. The "HBS" SPRs and "HBS" strips were inserted into the instrument. The color labels with the assay code on the SPRs and the Reagent Strips were checked to make sure that both are matching each other. The assay was initiated as directed in the User's Manual. All the assay steps were performed automatically by the instrument. After the assays were completed, the SPRs and strips were removed from the instrument. Elisa less than 1 is negative while Elisa equal to or greater than 1 is positive.

RESULTS

Demographic distribution of patients

A total of 4500 patients were screened through ICT (immune-chromatography technique) to detect HBsAg. Out of total patients, 110 were found as

positive for HBV infection with a frequency of 1.8% having 75 (68.18%) males, and 35 (31.81%) female population was infected (Table 1) The present studied classified patients base on the age of the patient. Group 1 >20 years, Group 2 21-40, Group 3 41-60, and group 4 were above 60 years old patients. The highest prevalence of HBV infection was recorded in the age group 41-60, 49 (45%), followed by age group 29 (26%). Similarly, 22 (20%) in group 1 and 10 (9%) in group 4 (Table 1). Additionally, most of the patients HBV positive were having more than one risk factors, risk factors are depicted in Fig 1.

DISCUSSION

Approximately 350 million people in Asia and the Pacific have been verified for the hepatitis B virus (HBV) due to its infectious nature, prenatal transmission, and early chronic infection (18). Pakistan is with the carrier of 7 million people with an intermediate HBV prevalence area (19,20). According to previous reports, the overall prevalence of HBV in the northern areas of Pakistan is about 37% (21).

In the present study, the prevalence of HBV in surgical patients was and some volunteer blood donors are 1.8%. On the other hand, some studies are in contrast to our findings with 6.6%, 2.11% respectively (23,24). The present study investigated the highest ratio of preoperative patients with HBV infection was 68.18 percent in males as compared to 31.81 percent in females.

Similarly, the same results were also shown in the previous study which demonstrates that HBV infection in males is higher than females (25). Another published data in Dera Ismail Khan Khyber Pakhtunkhwa shows a prevalence of 3.18% HBV infection among preoperative patients in which most of the infected individuals were female (26). Similar findings and results were seen in other country studies, in which males are infected in greater numbers as compared to females (27-28). There are maybe two possible reasons, one, the majority of males are more exposed to social activities as compared to females, so males are having more sexual contacts and other social activities.

Some reports, however, disputed the findings being the higher prevalence for females than for males (29,30). In 2010, the studies were conducted in various eye camps in Pakistan showed that a higher prevalence of the disease was found in females of 60.18% than in males of 39.81% (31). The highest

prevalence (45%) of HBV was seen positive in the age group 41-60 followed by age group 21-40, (26%), the lowest percentage of 9% was found in age group 4 as shown in Table 1 Similarly, the same results were found in their study regarding age groups which is in concordance with our reports (32). In the present study, the percentage of HBV infection was 1.8% among preoperative patients. Our findings were correlated with another study conducted in Japan of 34,336 patients, HBV seropositivity prevalence was found to be 1.8% (22). Our study also presented the patient's history which might be the risk factor for hepatitis B virus infection. The highest infection rate of 58.1% was seen in patients having a history of blood transfusion. The previous studies conducted in Pakistan based on blood donors having HBV infection in the high ratio (33-36) which is comparable with our findings in blood transfusion patients. The prevalence of HBV infection is very high in hospitalized patients it might be due to improper screening before surgeries. The reason may be the use of non-sterilized surgical instruments, blood products, and a lack of well-trained staff.

CONCLUSION:

The prevalence of HBV infection is very high in hospitalized patients it might be due to improper screening before surgery. The reason may be the use of non-sterilized surgical instruments, blood products, and lack of untrained staff. So, the screening before surgeries should be made inescapable and compulsory to overcome threats of asymptomatic for treatment.

CONFLICT OF INTEREST

The authors do not report any financial or personal connections with other persons or organizations, which might negatively affect the contents of this publication and/or claim authorship rights to this publication.

ACKNOWLEDGMENT

We would like to acknowledge all the supports and guidance provided by tehsil health officer Dargai for his courteous attention. We are also thankful to our colleagues especially Mr. Mahboob ul Haq for technical support.

Table 1: Age and gender-wise distribution of HBV positive patients

Total individuals	Overall % of HBV Infection	Infected male %	Infected female %	Age groups (In years)	No of infected individuals	% of infected individuals
4500	1.8%	(68.18%)	(31.81%)	>20	22	20%
				21-40	29	26%
				41-60	49	45%
				Above 60	10	9%

**Fig 1. Risk factors for HBV positive patients****REFERENCES**

1. Khokhar, N., Gill, M. L., & Malik, G. J. (2004). General seroprevalence of hepatitis C and hepatitis B virus infections in the population. *Journal of the College of Physicians and Surgeons--Pakistan: JCPSP*, 14(9), 534-536.
2. Quddus, A., Luby, S. P., Jamal, Z., & Jafar, T. (2006). Prevalence of hepatitis B among Afghan refugees living in Balochistan, Pakistan. *International Journal of Infectious Diseases*, 10(3), 242-247.
3. Centers for Disease Control and Prevention (CDC). (2003). Global progress toward universal childhood hepatitis B vaccination, 2003. *MMWR. Morbidity and mortality weekly report*, 52(36), 868.
4. Alam, S., Azam, G., Mustafa, G., Alam, M., & Ahmad, N. (2017). Past, present, and future of hepatitis B and fatty liver in Bangladesh. *Gastroenterol Hepatol Open Access*, 6(3), 197.
5. Matin, A., Islam, M. R., Mridha, M. A. A., Mowla, M. G., Khan, R., & Islam, M. R. (2011). Hepatitis B & C viral markers status

- in icteric children at a tertiary care hospital. *Journal of Shaheed Suhrawardy Medical College*, 3(2), 35-37.
6. World Health Organization. Global distribution of hepatitis A, B, and C. *Wkly Epidemiol Rec* 2002;77:41—8.
 7. Shefer, A., Atkinson, W., Friedman, C., Kuhar, D. T., Monterey, G., Bialek, S. R., ... & Lorick, S. A. (2011). Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 60(7), 1-45.
 8. Ali, S. A., Donahue, R. M., Qureshi, H., & Vermund, S. H. (2009). Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *International journal of infectious diseases*, 13(1), 9-19.
 9. Jafri, W., Jafri, N., Yakoob, J., Islam, M., Tirmizi, S. F. A., Jafar, T., ... & Nizami, S. Q. (2006). Hepatitis B and C: prevalence and risk factors associated with seropositivity among children in Karachi, Pakistan. *BMC infectious diseases*, 6(1), 101.
 10. Noorali, S., Hakim, S. T., McLean, D., Kazmi, S. U., & Bagasra, O. (2008). Prevalence of Hepatitis B virus genotype D in females in Karachi, Pakistan. *The Journal of Infection in Developing Countries*, 2(05), 373-378.
 11. Hakim, S. T., Kazmi, S. U., & Bagasra, O. (2008). Seroprevalence of hepatitis B and C genotypes among young apparently healthy females of Karachi-Pakistan. *Libyan Journal of Medicine*, 3(2), 66-70.
 12. Ali, M., Idrees, M., Ali, L., Hussain, A., Rehman, I. U., Saleem, S., ... & Butt, S. (2011). Hepatitis B virus in Pakistan: a systematic review of prevalence, risk factors, awareness status and genotypes. *Virology journal*, 8(1), 102.
 13. Zeeshan, M., Anwar, F., Shah, I. A., & Shah, M. Prevalence of HBV, HCV, HIV and syphilis in blood donor at Mardan Medical complex, Khyber Pakhtunkhwa, Pakistan.
 14. Shah, I. A., Anwar, F., Haq, I. U., Anwar, Y., Aizaz, M., & Ullah, N. (2018). HBV Burden on Population, a Comparative Study between Two Districts Mardan and Charsadda of KPK, Pakistan. *International Journal of Contemporary Research and Review*, 9(09), 20269-20274.
 15. Alter, M. J. (2006). Epidemiology of viral hepatitis and HIV co-infection. *Journal of hepatology*, 44, S6-S9.
 16. Ali, S. A., Donahue, R. M., Qureshi, H., & Vermund, S. H. (2009). Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *International journal of infectious diseases*, 13(1), 9-19.
 17. Lee, W. M. (1997). Hepatitis B virus infection. *New England journal of medicine*, 337(24), 1733-1745.
 18. Vryheid, R. E., Yu, E. S., Mehta, K. M., & McGhee, J. (2001). The declining prevalence of hepatitis B virus infection among Asian and Pacific Islander children. *Asian American and Pacific Islander journal of health*, 9(2), 162-178.
 19. Ali, M., Idrees, M., Ali, L., Hussain, A., Rehman, I. U., Saleem, S., ... & Butt, S. (2011). Hepatitis B virus in Pakistan: a systematic review of prevalence, risk factors, awareness status and genotypes. *Virology journal*, 8(1), 102.
 20. André, F. (2000). Hepatitis B epidemiology in Asia, the middle East and Africa. *Vaccine*, 18, S20-S22.
 21. Tanveer, A., Batool, K., & Qureshi, A. W. (2008). Prevalence of hepatitis B and c in university of the Punjab, Quaid-e-azam campus, Lahore. *ARPJ Agri and Bio Sci*, 3, 30-32.
 22. Taguchi, S., Nishioka, K., Kawaguchi, R., Nakao, M., Watanabe, I., & Migita, T. (2004). Epidemiological study of hepatitis B and C in 34,336 patients operated at Hiroshima Prefectural Hospital during the period from 1993 to 2000. *Masui. The Japanese journal of anesthesiology*, 53(6), 696-700.
 23. Erden, S., Büyüköztürk, S., Calangu, S., Yilmaz, G., Palanduz, S., & Badur, S. (2003). A study of serological markers of hepatitis B and C viruses in Istanbul, Turkey. *Medical Principles and Practice*, 12(3), 184-188.
 24. Chaudhary, I. A., & Khan, S. A. (2005). Samiullah: Should we do hepatitis B and C

- screening on each patient before surgery: Analysis of 142 cases. *Pak J Med Sci*, 21(3), 278-80.
25. Lewis-Ximenez, L. L., Ginuino, C. F., Silva, J. C., Schatzmayr, H. G., Stuver, S., & Yoshida, C. F. (2002). Risk factors for hepatitis B virus infection in Rio de Janeiro, Brazil. *BMC Public Health*, 2(1), 26.
 26. Ahmad, I., Khan, S. B., ur Rehman, H., Khan, M. H., & Anwar, S. (2006). Frequency of Hepatitis B and Hepatitis C among cataract patients. *Gomal Journal of medical sciences*, 4(2).
 27. Khan, T. S., Rizvi, F., & Rashid, A. (2003). Hepatitis C seropositivity among chronic liver disease patients in Hazara, Pakistan. *Journal of Ayub Medical College Abbottabad*, 15(2).
 28. Naeem, S. S., Siddiqui, E. U., Kasi, A. N., Khan, S., Abdullah, F. E., & Adhi, I. (2012). Prevalence of Hepatitis 'B' and Hepatitis 'C' among preoperative cataract patients in Karachi. *BMC research notes*, 5(1), 492.
 29. Javed, I. F., & Rukhsana, J. F. (2000). Relative frequency of hepatitis "B" virus and hepatitis "C" virus infections in patients of cirrhosis in NWFP. *JCPSP, Journal of the College of Physicians and Surgeons-Pakistan*, 10(6), 217-219..
 30. Naeem, S. S., Siddiqui, E. U., Kasi, A. N., Khan, S., Abdullah, F. E., & Adhi, I. (2012). Prevalence of Hepatitis 'B' and Hepatitis 'C' among preoperative cataract patients in Karachi. *BMC research notes*, 5(1), 492.
 31. Nangrejo, K. M., Qureshi, M. A., Sahto, A. A., & Siddiqui, S. J. (2011). Prevalence of Hepatitis B and C in the patients undergoing cataract surgery at eye camps. *Pakistan Journal of Ophthalmology*, 27(1).
 32. Bathala, N. S., Bharathi, M., Sasikala, A., Sasidhar, M., & Bai, S. K. (2016). A Study on Pre-Surgical Screening of Hepatitis B Surface Antigen in a Tertiary Care Hospital in South India. *Int. J. Curr. Microbiol. App. Sci*, 5(10), 432-438.
 33. Khan, A. A., Ahmad, S., Haider, Z., Iqbal, J., & Khan, R. U. (1996). Prevalence of seromarkers of HBV and HCV in health care personnel and apparently healthy blood donors.
 34. Bhatti, F. A., Shaheen, N., & Tariq, W. (1996). Epidemiology of hepatitis C virus in blood donors in northern Pakistan. *Pak. Armed Forces Med J.*, 46, 19-20.
 35. Masood, Z., Jawaid, M., Khan, R. A., & Rehman, S. (2005). Screening for hepatitis B & C: a routine pre-operative investigation. *Pakistan Journal of Medical Sciences*, 21(4), 455.
 36. Rahman, M. U., Akhtar, G. N., & Lodhi, Y. (2002). Transfusion transmitted HIV and HBV infections in Punjab, Pakistan. *Pakistan journal of medical sciences*, 18(1), 18-25.