

Research Article	Pak-Euro Journal of Medical and Life Sciences	
DOI: 10.31580/pjmls.v5i2.2556	Copyright © All rights are reserved by Corresponding Author	
Vol. 5 No. 2, 2022: pp. 275-282		
www.readersinsight.net/pjmls		
Submission: May 13, 2022	Revised: June 27, 2022	Accepted: June 29, 2022

HEMATOLOGICAL AND CLINICAL ANALYSIS OF HEPATITIS B PATIENTS FROM QUETTA PAKISTAN

Abdul Latif¹, Sadia Sabir², Saima Iram³, Pari Gul⁴, Asma Yousafzai^{5*}

¹Department of Microbiology, Balochistan University of Information Technology, Engineering and Management Sciences (BUIITEMS), Quetta, Pakistan

²Department of Biosciences, COMSATS University, Islamabad, Pakistan

³Department of Pathology, Bolan Medical College, Quetta, Pakistan

⁴Institute of Biochemistry, University of Balochistan, Quetta, Pakistan

⁵Department of Biotechnology, Balochistan University of Information Technology, Engineering, and Management Sciences (BUIITEMS), Quetta, Pakistan

*Corresponding Author: Prof. Dr. Asma Yousafzai. E. mail: asmak103@gmail.com



Abstract

Background: Hepatitis B Virus (HBV) infection is still a serious worldwide health concern. The primary mechanisms of HBV transmission in Pakistan include the use of infected tools in medical and dental practices, unsafe blood transfusion, and a family history of HBV infection. Pakistan has a high HBV prevalence, with 4.55 million persons affected. The cause for this might be a lack of sufficient health facilities, a bad economic situation, and insufficient knowledge regarding the spread of infections such as HBV. In this study, to access the possible risk factors that may lead to HBV infection and its prevalence by the analysis of hematological and hepatic parameters.

Methods: Peripheral blood samples from 244 individuals confirmed for hepatitis B virus infection both including males and females were collected and further processed for complete blood counts and liver function profile. General characteristics were recorded interview and questionnaire.

Results: A total of 244 HBV-positive patients were included in the study. Their ages were range from 17-78 years. The HBV rate was higher in males 175 (71.7%) and 69 (28.3%) in females. Out of one hundred forty-four patients, 143 (58.60%), individuals were from rural areas and 101 (41.60 %) were from urban areas. majority of the individuals 148 (60.7%) were married and 87 (35.7%) were unmarried. According to their education, most of the participants 101 (41.4%) were illiterate and only 61 (25.0%) had a higher level of education. Dental history and smoking habits were recorded in 71 (29.1%) patients respectively. Similarly, a family history of hepatitis B infection was recorded in 51 (20.9%) and only 15 (6.1%) had a blood transfusion history.

Conclusion: In rural areas of Quetta, Balochistan, Pakistan, the current study demonstrated a significant incidence of HBV infection. The observed prevalence rate was much higher in males than females this might be due increased exposure to common risk factors. To prevent the spread of HBV infection, to educate the people about the potential risk factors associated to HBV and that vaccination be extended in high prevalent regions.

Keywords: Complete Blood Count, Hepatitis B, Liver, Serology, Transfusion

INTRODUCTION

Hepatitis is a severe health concern worldwide, despite continual advancements in prevention and treatment (1). HBV can cause a variety of clinical symptoms, including AC (asymptomatic carrier) state (2), which can progress to acute liver failure, compensated liver cirrhosis (CC), chronic active hepatitis B (CAH), immune tolerant phase (IP), and hepatocellular carcinoma (HCC) (3-6). Each of these problems can be caused by hepatitis B co-infection with a variety of different hepatitis viruses that share suppression of viral replication (7). Hepatitis type-B (HB) has infected two billion people globally (8). It is predicted that about 292 million individuals globally have chronic hepatitis B (CHB). Every year, although chronic infection occurs in around 90% of babies, 30–50% of five-year-old children, and 5–10% of adults (9-12).



Hepatitis B virus infection was prevalent in 6.1 percent of African nations and 6.2 percent of Western Nations, and 68 percent of infected persons lived in Africa and West Pacific Asia (13-15). Furthermore, 5–15 percent of populations in developing and low-income nations are chronic carriers of hepatitis B infection (16). Furthermore, according to WHO, hepatitis is responsible for 1.34 million fatalities in 2015, which is similar to TB deaths but greater than HIV deaths (17, 18). After cigarettes, it is the second most prevalent human carcinogen (19). The virus is extremely infectious and 50 to 100 times more infectious than the human immunodeficiency virus (HIV) (20). Its remarkable resistance allows it to remain on dry surfaces for more than a week, complicating epidemiology and increasing the chance of horizontal intra-familial transmission (21).

HBV affects 4.55 million individuals in Pakistan (22). Despite the government of Pakistan's hepatitis control and preventive measures, the incidence of HBV and HCV is rising in the country. It might be due to a big pool of HBV- and HCV-infected persons infecting and increasing the general population. This might be due to a lack of information regarding transmission channels and preventative methods (22).

The virus is spread by contact with infected people's bodily fluids, such as blood, seminal fluid, and vaginal secretions (23). The clinical prognosis in both acute and chronic instances is heavily influenced by the patient's age and immunological status (24). However, jaundice affects 30 to 50% of adolescents and adults. High-grade fever, joint and muscular discomfort, loss of appetite, and stomach ache are all possible symptoms of the illness. Some people may experience bloating, jaundice, and nausea. Individuals with chronic hepatitis B may develop liver inflammation, hepatocellular damage, cirrhosis, and hepatocellular cancer (25-27).

The purpose of the current investigation is to examine the hematological and clinical parameters of HBV infected patients living in the province of Balochistan, Pakistan. And to investigate the association of HBV infection and socio-demographic as well as clinical attributes such as gender, age, family history, blood transfusion, marital status, dental history, or some other medical condition.

MATERIALS AND METHODS

STUDY DESIGN

This investigation was performed on HBV-positive patients who were referred to the Bolan medical college, Saleem Medical Complex, Heart and General Hospital Quetta. All participants in the study provided a written consent statement. The study was permitted by the local ethics committee of Balochistan University of Information Technology and Management Sciences (BUIITEMS), Quetta Pakistan.

SAMPLE SIZE

The present study was conducted on a total of 244 positive patients. Both males and females were comprised in the research 175 (71.7%) were male and 69 (28.3%) were female and their ages ranged from 17-78 years. As this investigation was a cross-sectional, so for the collection of patients data questionnaire was filled which was developed to record the patient's demographic information such as age, gender, address, and also clinical information, Fever, Anorexia, fatigue, etc.

SAMPLE COLLECTION

A total of 5 ml of blood samples were collected from each patient through the venipuncture technique and then displaced into a plain container. The sample was collected through the standard procedure and after the collection of blood samples at the proper time all samples were safely transferred to the laboratory for laboratory and clinical analysis. Blood serum was used for the analysis of complete blood picture (CBC) and liver function test (LFT) respectively. (Selectra Pro XL automated analyzer was used for a liver function test. CBC was analyzed by the Sysmex machine).

HEMATOLOGICAL ANALYSIS



A total of 5 ml of blood samples were collected from each patient through the venipuncture technique and then displaced into a plain container. The sample was collected through the standard procedure and after the collection of blood samples at the proper time all samples were safely transferred to the laboratory for laboratory and clinical analysis. Blood serum were used for the analysis of complete blood picture (CBC) and liver function test (LFT) respectively. (Selectra Pro XL automated analyzer was used for a liver function test. CBC was analyzed by the Sysmex machine).

STATISTICAL ANALYSIS

The data were evaluated by the Statistical Package for Social Scientist (SPSS) Statistical Software (version 22). The categorical variables were stated in percentages whereas the continuous variables were stated as mean \pm standard deviation. Calculation of means was carried out using the t-test.

RESULTS AND DISCUSSION

In this study, a total of 244 hepatitis B positive blood samples were taken of which 175 (71.7%) were male and 69 (28.3%) were female and their age ranged in from 17 to 78 years old. Out of one hundred forty-four patients, 143 (58.60%), individuals were from rural areas and 101 (41.60 %) were from urban areas. The current study included those who tested positive for hepatitis B. All the patients were interviewed by a detailed questionnaire. (Table I) shows the general characteristics of all patients. Based on the marital status majority of the individuals 148 (60.7%) were married and 87 (35.7%) were unmarried. According to their education, most of the participants 101 (41.4%) were illiterate and only 61 (25.0%) had a higher level of education. Among general characteristics, some of the general characteristics of the study population might be a risk point for acquiring hepatitis B infection. Dental history and smoking habits were recorded in 71 (29.1%) patients respectively. Similarly, a family history of hepatitis B infection was recorded in 51 (20.9%) and only 15 (6.1%) had a blood transfusion history.

Table I. General characteristics of the participants

General characteristics	Frequency	Percent
Gender		
Male	175	71.7%
Female	69	28.3%
Residence		
Rural	143	58.60%
Urban	101	41.60%
Marital status		
Single	87	35.7%
Married	148	60.7%
Divorced	1	0.4%
Widow	8	3.3%
Education level		
Illiterate	101	41.4%
Primary level	21	8.6%
Secondary level	61	25.0%
Higher level	61	25.0%
Family history		
Dental history	71	29.1%
Family history	51	20.9%
Blood transfusion	15	6.1%
Smoking habit	71	29.1%

(Table II) shows the sign and symptoms of the disease among participants related to the disease. Fever was recorded in 226 (92.6%) which was more common in the majority of the participants. Also, anorexia and fatigue were found in most of the patients 178 (73.0%) and 207 (84.8%) respectively.

Table II. Sign and symptoms of the disease among participants

Sign and symptoms	Frequency	Percentage
Fever	226	92.6%
Jaundice	36	14.8%
Anorexia	178	73.0%
Fatigue	207	84.8
Other complication	2	0.8%

Table III and Table IV show the liver function and complete blood count parameters respectively. Among liver function parameters Total bilirubin was recorded at 1.11 ± 0.53 , AST, ALT and ALP were 31.86 ± 14.71 , 40.41 ± 19.79 , and 239.70 ± 62.92 respectively. According to table number 5 which shows the complete blood count parameters, RBC was recorded at 4.74 ± 0.62 . Hemoglobin was recorded at 13.28 ± 2.10 . White blood cells and platelets were found at 6101.55 ± 1363.44 and 329467.21 ± 123963.70 respectively. Other parameters are shown in the (Table V).

Table III. LFTs parameters of the participants

Parameters	Mean	\pm SD
Total bilirubin	1.11	0.53
AST	31.86	14.71
ALT	40.41	19.79
ALP	239.70	62.92

Table IV. complete blood count parameters of the participants

Parameters	Mean	\pm SD
WBC	6101.55	1363.44
HGB	13.28	2.10
PLT	329467.21	123963.70
RBC	4.74	0.62
MCH	26.90	3.92
MCHC	32.23	3.45
HCT	39.68	4.82
MCV	81.84	6.24
LY%	27.41	6.82
MON%	6.65	2.39
NEU%	63.83	7.02
BA%	1.92	1.46
EO%	0.19	0.39

DISCUSSION



The purpose of this cross-sectional study was to evaluate the demographic features, general characteristics, clinical signs and symptoms, and the impact of hepatitis B on liver function and hematological parameters. The bulk of the 143 patients (58.60 percent) in this research were from the rural districts of Pakistan's Balochistan province. Previously, extreme research was undertaken in Pakistan so far has similarly been limited to metropolitan regions. Previous research has shown that the majority of HBV-positive participants lived in rural regions with poor economic status. Rural areas are home to more than 67.5 percent of Pakistan's population. HBV infection is more common in poor socioeconomic conditions, as has been widely established (28, 29). In our study, the bulk of the participants were male (175 in total) (71.7 percent). These findings are pretty comparable to the previous study, which found a higher prevalence of HBV in males than females in studies in Pakistan (29, 30). Similar findings were achieved in Bangladesh, where researchers discovered a higher frequency in men (67.86 percent) than females (32.14 percent) (31).

In our current study, 71 people had their dental history documented (29.1 percent). Because of the prevalence of HBsAg in the saliva of acute and chronic hepatitis B patients, infected dental equipment play a crucial role in HBV infection (28). In reality, most of these practitioners lack sufficient autoclaving equipment, and others are illiterate and have no idea what autoclaving is. Thus, a lack of effective sterilizing measures and the reuse of infected dental equipment might explain the high incidence rate in these locations.

These findings are reinforced by Shazi *et al.* (2006), who found comparable results (43.9 percent) for dental hazards (32). In comparison to the current study, Usman *et al.* (2003) found a significant percentage (60%) of HBV patients have a prior history of dental surgery (30).

Based on surgical exposure, such as dental history, our findings suggest that some patients in the research had a dental history, although earlier studies done by Nawfal *et al.* (2015) found that none of the patients had a dental history (33). Similarly, Elah *et al.* (2011) observed an increase among individuals having a dental history (34). According to our investigation, blood transfusion history was discovered in 15 (6.1 percent) of the participants, which is perhaps connected to A study done at the Armed Force Institute of Transfusion, Islamabad, which revealed that 3.3 percent of blood donors from Northern Pakistan were HBsAg positive (35). HBV prevalence was reported to be 2.04 percent in Lahore and 2.06 percent in healthy blood donors in Faisalabad (36). In our study, a small number of 51 (20.9%) patients had a family history of infection which is concatenated to the study performed by Hussien *et al.* (2015) (33). This could be due to the limited sample size.

CONCLUSION

It is concluded from the present investigation that HBV infection was more prevalent in rural areas compared to urban areas. Males were found to have a higher frequency than females. Different factors were identified including dental history and family history which might contribute to the spread of the HBV infection. The fast identification of those infected with HBV is required to stop its rapid spread. During surgical and dental procedures, strict aseptic precautions should be taken. According to the study's findings, it is strongly advised that public awareness regarding HBV, good medical and dental practices, and vaccination programs should be organized

Conflict of Interest:

Declared none.

References:

1. Voiculescu M, Iliescu L, Ionescu C, Micu L, Ismail G, Zilisteanu D, Radasan A, Micu G, Pertache I. A cross-sectional epidemiological study of HBV, HCV, HDV and HEV prevalence in the SubCarpathian and South-Eastern regions of Romania. *Journal of Gastrointestinal & Liver Diseases*. 2010;19(1).
2. Brunetto MR, Oliveri F, Colombatto P, Moriconi F, Ciccorossi P, Coco B, Romagnoli V, Cherubini B, Moscato G, Maina AM, Cavallone D. Hepatitis B surface antigen serum levels help to distinguish active from inactive hepatitis B virus genotype D carriers. *Gastroenterology*. 2010;139(2):483-90.



3. Yan Z, Tan W, Zhao W, Dan Y, Wang X, Mao Q, Wang Y, Deng G. Regulatory polymorphisms in the IL-10 gene promoter and HBV-related acute liver failure in the Chinese population. *Journal of viral hepatitis*. 2009;16(11):775-83.
4. Mumtaz K, Ahmed US, Memon S, Khawaja A, Usmani MT, Moatter T, Hamid S, Jafri W. Virological and clinical characteristics of hepatitis delta virus in South Asia. *Virology journal*. 2011;8(1):1-8.
5. Kennedy PT, Litwin S, Dolman GE, Bertolotti A, Mason WS. Immune tolerant chronic hepatitis B: the unrecognized risks. *Viruses*. 2017;9(5):96.
6. Brechot C, Kremsdorf D, Soussan P, Pineau P, Dejean A, Paterlini-Brechot P, Tiollais P. Hepatitis B virus (HBV)-related hepatocellular carcinoma (HCC): molecular mechanisms and novel paradigms. *Pathologie Biologie*. 2010;58(4):278-87.
7. Mumtaz K. Virological and clinical characteristics of hepatitis delta virus in South Asia. *Virology journal*, 2011;8(1):312.
8. Shepard CW, Simard EP, Finelli L, Fiore AE, Bell BP. Hepatitis B virus infection: epidemiology and vaccination. *Epidemiologic reviews*. 2006;28(1):112-25.
9. Kim BH, Kim WR. Epidemiology of hepatitis B virus infection in the United States. *Clinical liver disease*. 2018;12(1):1.
10. Ghenea AE, Pădureanu V, Cioboată R, Udriștoiu AL, Drocaș AI, Țieranu E, Carsote M, Vasile CM, Moroșanu A, Biciușcă V, Salan AI. The Study of Clinical and Biochemical Parameters in Assessing the Response to the Antiviral Therapy in the Chronic Viral Hepatitis B. *Medicina*. 2021;57(8):757.
11. Howell J, Pedrana A, Schroeder SE, Scott N, Aufegger L, Atun R, Baptista-Leite R, Hirschschall G, Hutchinson SJ, Lazarus JV, Olufunmilayo L. A global investment framework for the elimination of hepatitis B. *Journal of hepatology*. 2021;74(3):535-49.
12. Hennessey K, Mendoza-Aldana J, Bayutas B, Lorenzo-Mariano KM, Diorditsa S. Hepatitis B control in the World Health Organization's Western Pacific Region: targets, strategies, status. *Vaccine*. 2013;31:85-92.
13. Surial B, Wyser D, Béguelin C, Ramírez-Mena A, Rauch A, Wandeler G. Prevalence of liver cirrhosis in individuals with hepatitis B virus infection in sub-Saharan Africa: Systematic review and meta-analysis. *Liver international*. 2021;41(4):710-9.
14. Shan S, Jia J. Prevention of Mother-to-Child Transmission of Hepatitis B Virus in the Western Pacific Region. *Clinical Liver Disease*. 2021;18(1):18.
15. Lim JK, Nguyen MH, Kim WR, Gish R, Perumalswami P, Jacobson IM. Prevalence of chronic hepatitis B virus infection in the United States. *Official journal of the American College of Gastroenterology | ACG*. 2020;115(9):1429-38.
16. Nwokediuko SC. Chronic hepatitis b: Management challenges in resource-poor coun-tries. *Hepatitis monthly*. 2011;11(10):786.
17. Kinfe H, Sendo EG, Gebremedhin KB. Prevalence of Hepatitis B Virus Infection and Factors Associated with Hepatitis B Virus Infection Among Pregnant Women Presented to Antenatal Care Clinics at Adigrat General Hospital in Northern Ethiopia. *International Journal of Women's Health*. 2021;13:119.
18. MacLachlan JH, Cowie BC. Hepatitis B virus epidemiology. *Cold Spring Harbor perspectives in medicine*. 2015;5(5):a021410.
19. Pollicino T, Saitta C, Raimondo G. Hepatocellular carcinoma: the point of view of the hepatitis B virus. *Carcinogenesis*. 2011;32(8):1122-32.
20. Mohammed HI, Pennap GR, Oti VB, Adoga MP. Markers of hepatitis B virus infection in a subset of young people in central Nigeria. *Scientific African*. 2019;5:00121.
21. Kafeero HM, Ndagire D, Ocama P, Kudamba A, Walusansa A, Sendagire H. Prevalence and predictors of hepatitis B virus (HBV) infection in east Africa: evidence from a systematic review and meta-analysis of epidemiological studies published from 2005 to 2020. *Archives of Public Health*. 2021;79(1):1-9.
22. Samo AA, Laghari ZA, Baig NM, Khoso GM. Prevalence and risk factors associated with hepatitis B and C in Nawabshah, Sindh, Pakistan. *The American Journal of Tropical Medicine and Hygiene*. 2021;104(3):1101..
23. Komatsu H, Inui A, Fujisawa T. The role of body fluids in the horizontal transmission of hepatitis B virus via household/close contact. *EMJ*. 2016;1(1):68-75.
24. Pan CQ, Zhang JX. Natural history and clinical consequences of hepatitis B virus infection. *International journal of medical sciences*. 2005;2(1):36.
25. Odiabara K, Bartimaeus EA, Nwachuku EO, Boisa N. Assessment of Liver Functions Parameters of Asymptomatic Apparently Healthy Hepatitis B Virus Carriers among Voluntary Blood Donors in Some Parts of Nigeria. *Sch J App Med Sci*. 2022;1:34-45.

26. Shiffman ML. Management of acute hepatitis B. *Clinics in liver disease*. 2010;14(1):75-91.
27. Regev A, Schiff ER. Clinical features of hepatitis. *Viral Hepatitis*. 3rd ed. Malden, MA: Blackwell Publishing. 2005;12:32-49.
28. Khan F, Akbar H, Idrees M, Khan H, Shahzad K, Kayani MA. The prevalence of HBV infection in the cohort of IDPs of war against terrorism in Malakand Division of Northern Pakistan. *BMC infectious diseases*. 2011;11(1):1-6.
29. Alam MM, Zaidi SZ, Malik SA, Naeem A, Shaukat S, Sharif S, Angez M, Khan A, Butt JA. Serology based disease status of Pakistani population infected with Hepatitis B virus. *BMC infectious diseases*. 2007;7(1):1-4.
30. Usman HR, Akhtar S, Rahbar MH, Hamid S, Moattar T, Luby SP. Injections in health care settings: a risk factor for acute hepatitis B virus infection in Karachi, Pakistan. *Epidemiology & Infection*. 2003 Apr;130(2):293-300.
31. Mahtab MA, Rahman S, Karim MF, Khan M, Foster G, Solaiman S, Afroz S. Epidemiology of hepatitis B virus in Bangladeshi general population. *Hepatobiliary & pancreatic diseases international: HBPD INT*. 2008;7(6):595-600.
32. Shazi L, Abbas Z. Comparison of risk factors for hepatitis B and C in patients visiting a gastroenterology clinic. *Journal of the College of Physicians and Surgeons--Pakistan: JCPSP*. 2006;16(2):104-7.
33. Hussein NR, Rasheed ZA, Taha AA, Shaikhow SK. The prevalence of hepatitis D Virus infection amongst patients with Chronic active hepatitis B Virus infection in Duhok Governorate. *International Journal of Pure and Applied Sciences and Technology*, 2015;28(1):1.
34. Elahe T, Sara T, Ramin Y, Manochehr M, Forough T, Sodabe H. Serological survey of HDV-Ab in HBsAg positive blood donors in Shahrekord, Iran. *African Journal of Microbiology Research*. 2011;5(10):1243-5.
35. Khattak MF, Salamat N, Bhatti FA, Qureshi TZ. Seroprevalence of hepatitis B, C and HIV in blood donors in northern Pakistan. *J Pak Med Assoc*. 2002;52(9):398-402.
36. Hashmie ZY, Chaudhary AH, Ahmad M, Ashraf M. Incidence of healthy voluntary blood donors at Faisalabad. *The Prof Med J*. 1999;6:551-5.
- 37.

