

Risk Assessment of Hepatitis B Patients of Northern Areas of Pakistan: A case control study

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ABSTRACT

Background: Hepatitis B (HBV) is a common chronic viral disease that affects liver. About 7% people worldwide are infected with HBV with the majority of the cases seen in developing countries with limited medical facilities. It is a blood-borne disease and contributing factors for risk assessment varies from place to place.

Aim: To acquire key factors for risk assessment of hepatitis B patients of the northern area of Pakistan.

Methods: A case-control study was done among the patients visiting Ayub Teaching Hospital for a regular checkup. The sample included 80 cases and 80 controls by the non-probability convenient method. Data was collected using a structured questionnaire and analyzed by SPSS 23. Frequencies, mean, standard deviation, p values and odds ratio were calculated.

Results: A total of 160 subjects were included in this study (80 controls & 80 cases of HBV). Mean age for cases was 38.74±13.597 years. Odds ratios and p values were calculated for different factors. The odds ratio for a history of blood transfusion, sharing toothbrushes, eliciting injectable drugs, history of recent dental procedure and surgical procedure were 1.581, 1.116, 2.206, 1.581 and 1.165 respectively.

Conclusion: Although not significant, yet, low socioeconomic status, family history and piercing ears/nose and tattoos resulted in a higher percentage as contributing factors of HBV infection. In Northern areas of Pakistan, these factors for risk assessment of hepatitis B should be kept in mind and proper disease awareness and primary prevention program should be observed.

Keywords: Hepatitis B virus (HBV), risk assessment, Northern areas, KPK, Pakistan.

INTRODUCTION

Hepatitis B virus is a on growing common problem that affects about 7% (350 million) population of the world. It is most prevalent in 28-37 years of age group¹. Developing countries with limited medical facilities has the highest spread rate of HBV². Out of 50 million new cases each year, 75% are diagnosed in Asia that leads to chronic hepatitis, cirrhosis and hepatocellular carcinoma (HCC)³. About 7-9 million HBV carriers (carrier rate=3-5%) are reported in Pakistan⁴. Due to hepatic failure and cancers, Pakistan has the highest burdens and mortality of chronic hepatitis.

HBV is a DNA virus with surface proteins antigen^{5,6}. These surface antigens are named Australian antigen as it was discovered in Australian population in 1960s⁷. Most cases of HBV are asymptomatic but acute cases may present with symptoms of anorexia, myalgia, nausea, low grade fever, abdominal pain, etc. after 45-180 days of entry into the human body⁸. Chronic HBV may progress to cirrhosis, chronic liver failure and hepatocellular carcinoma (HCC) over a period of years after the infection⁹.

Multiple recognized routes of transmission has led to higher risk of HBV transmission where parenteral route is the most common. Risk factors included contaminated whole blood or blood products transfusions, needle prick, tattooing, sexual transmission and body piercings. Vertical transmission from mother to their new born child is also common. Unhygienic dental procedures, surgeries, Intravenous drug abusers (IVDA), hemodialysis, etc. are all known risk factors for HVV transmission^{10,11}.

Synthetically produced vaccines are available against HBV with little or no side effects like pain, swelling and redness at the site of injection¹². HBV surface antigens (HBsAg, HBeAg and HBcAg) and the antibodies produced against these surface antigens are used for diagnosis of HBV infection through serological tests¹³. Interferon alpha and oral antiviral drugs are the most effective agents out of all available options for HBV treatment and are currently in use in many countries around the globe^{14,15}.

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Despite a plethora of knowledge on risk factors, diagnostic methods and treatment, risk assessment of HBV is not extensively done especially in a developing country like Pakistan. Moreover, national-level estimates of the key factors for risk assessment of hepatitis B are currently not available.

This study aimed to find key factors for the risk assessment of hepatitis B patients in the northern areas of Pakistan.

MATERIALS AND METHODS

This case control study was conducted at Medical Teaching instituted (MTI), Abbottabad (a tertiary care hospital in the Northern area of Pakistan), from June 2018 to June 2019. With the help of a non-probability convenient sampling technique, 160 participants were included. Among them, 80 were cases and 80 were controls. A pre-tested questionnaire was used to record the data. Confirmed/diagnosed cases of HBV on polymerase chain reaction (PCR) were included, irrespective of age and gender. Those with hepatitis other than B, non-alcoholic fatty liver diseases, hepatic carcinoma, biliary and genetic diseases of the liver were excluded. The Control group was selected from the same population and comprised of all those, who did not have hepatitis B or other liver diseases were included in the control group. A written informed consent was obtained by all the participants keeping in view the ethical consideration. Data were analyzed using IBM-SPSS (version 23). Qualitative variables are presented in frequencies and percentages, whereas continuous variables as Mean±SD. Odds ratios and P values were taken to show the significance of key risk factors for risk assessment. Permission was granted by the Institutional Ethical Review Board.

RESULTS

In this study, 38.74±13.597 was the mean age for the cases. A total of 160 subjects (80 controls and 80 cases) were included in this study. In cases, 47(58.8%) were male and 33(41.2%) were female. Among 80, 62(77.5%) of the cases were married whereas, 15(14.4%) were not married.

Among these cases, 44(27.5%) of the cases were diagnosed in last 6 months, 20(12.5%) had the history of HBV for more than 6 months up to 2 years, while 16(10%) cases were diagnosed more than two years ago (Table 1).

Among cases, 2(2.5%) patients had history of elicited injectable drugs use, 1(1.5%) by sharing syringes and 11(13.8%) shared toothbrush and/or razor. More than 60% patients

underwent dental procedures at some time and 36(45.0%) had undergone surgical procedures. No significance difference was found as the p-values were not less than 0.05 (Table 2).

Furthermore, there were 1.165 times greater chances of getting HBV for cases with tattooing, ear, or nose piercing than controls. Similarity, 1.18 times greater risk for syringe users (Table 3).

Table 1. Demographic details of participants.

Variables	Cases	Controls
Gender	Male	47(58.8%)
	Females	33(41.2%)
Marital Status	Married	62 (77.5%)
	Unmarried	15 (14.4%)
	Widowed	2 (2.5%)
	Divorced	1 (1.2%)
Educational status	Illiterate	42 (52.5%)
	literate	38(47.5)
Socioeconomic status	poor	68 (85.0%)

Table 2. Major key factors for comparison between cases and controls.

Group	Illicit drugs	injectable	Sharing syringes	of	Use of shared toothbrush/razor	Dental procedure	Surgical procedure
Case	Yes	2 (2.5%)	1(1.2%)		11(13.8%)	49(61.2%)	36(45.0%)
	No	78(97.5%)	1(1.2%)		69(86.2%)	31(38.8%)	44(55%)
	Total	80(100%)	78(97.6%)		80(100%)	80(100%)	80(100%)
Control	Yes	1(1.2%)	1(1.2%)		10(12.5%)	40(50%)	33(41.2%)
	No	79(98.8%)	79(98.8%)		70(87.5%)	40(50%)	47(58.8%)
	Total	80(100%)	80(100%)		80(100%)	80(100%)	80(100%)
P value	0.560	0.363	0.815		0.152	0.632	

P-value <0.005 is taken as significant*.

Table 3: Odds ratio of important key factors contributing to the risk of hepatitis B infection.

Group	Tattooing / ear / nose piercing	Received IV Fluids	Disposable syringe usage
Cases	Yes	68 (85%)	74 (92.5%)
	No	12 (15%)	6 (7.5%)
	Total	80 (100%)	80 (100%)
Control	Yes	72 (90%)	73 (91.2%)
	No	8 (10%)	7 (8.8%)
	Total	80 (100%)	80 (100%)
Odds Ratio	1.165	0.63	1.18

DISCUSSION

Hepatitis B is very prevalent in developing countries like Pakistan. Worldwide, its risk factors are very known. Yet there is a need for knowing key factors for risk assessment in Northern areas of Pakistan. This study intended to find the contributing factors for risk assessment associated with hepatitis B and resulted in intriguing variables discussed below.

Ayele et al., studied 125 HBV patients of which, 76(63.3%) were males and 44 (36.7%) females (male to female ratio was 1.7)¹. In our study, 47(58.8%) were male and 33(41.2%) were female. Odds ratio of 0.901 does not suggest gender as a risk factor. In this study of ours, 62(38.7%) cases were less than 31 years old (range 18-30)¹.

In a study by Akbar N *et al.*, low socioeconomic group was at risk of getting HBV as 4% of people with HBsAg positive were of low seriocomic status.¹⁷In the current study, 160 patients, 129 (80.6%) were poor.

Dickson RC *et al* found that 78.2% of live recipients developed hepatitis B from anti-HBc-positives donors and only 0.5% from anti-HBc-negative donor's livers (0.5%)¹.

Our study has the same results as of Hagan H *et al.*, when IVDA was studied²⁰.Out of 62 HBV patients, 35 (43.8%) had a history of tattoos/ear/nose piercing. Tattooing/nose/ear piercing is again a risk factor as stated by Jafari S *et al*¹⁵. According to Khattak *et al.*, 3.3% were HBsAg positive out of 103858 frequent blood donors²¹.Only 2 (1.2%) of the cases were blood donors which is not significant.

In our study, 36 (52.2%) had a history of surgical procedures. TheirOdds ratio was 1.165 which shows that people

with history of surgical procedures are at risk of getting HBV. According to Polakoff S *et al.*, 27(17.6%) out of 153 HBV had a history of surgery²².

CONCLUSION

Poor socioeconomic group, family history and piercing ears/nose and tattoos resulted in higher percentage ascontributing risk factors for HBV infection. Moreover, dental procedures, sharing toothbrushes, using illicit injectable drugs appeared as major factors for risk assessment of hepatitis B infection. In Northern areas of Pakistan, these factors for risk assessment of hepatitis B should be kept in mind and proper disease awareness and primary prevention program should be observed.

Conflict of interest: Nil

REFERENCES

- Ayele AG, Gebre-Selassie S. Prevalence and risk factors of hepatitis B and hepatitis C virus infections among patients with chronic liver diseases in public hospitals in Addis Ababa, Ethiopia. ISRN Tropical Medicine. 2013 Jan 3;2013.
- WHO | Hepatitis B [Internet]. 2016 [cited 20 March 2020]. Available from: <http://www.who.int/csr/disease/hepatitis/whocdscsrlyo20022/en/index1.html>
- Merican I, Guan R, Amarapuka D, Alexander MJ, Chutaputti A, Chien RN, et al. Chronic hepatitis B virus infection in Asian countries. J Gastroenterol Hepatol. 2000;15(12):1356-61.
- Ali M, Idrees M, Ali L, Hussain A, Rehman IU, Saleem S, et al. Hepatitis B virus in Pakistan: a systematic review of prevalence, risk factors, awareness status and genotypes. Virol. J. 2011 Mar 6;8(1):1.

5. Ali SA, Donahue RM, Qureshi H, Vermund SH. Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *IJID*. 2009;13(1):9-19.
6. Barbacid M, Breitman ML, Lauver AL, Long LK, Vogt PK, Beemon K, Wang LH. Synthesis and assembly of hepatitis B virus surface antigen particles in yeast. *Nature*. 1998 22;298:347.
7. Hepatitis B [Internet]. New South Wales; 2016 [cited 20 March 2020]. Available from: https://www.afao.org.au/_data/assets/pdf_file/0011/4511/BP0108_Hepatitis_B.pdf
8. Foundation T. Hepatitis B Foundation: Managing HBV: Acute Hepatitis B [Internet]. 2016 [cited 20 March 2020]. Available from: http://www.hepb.org/patients/acute_infections.htm
9. Bukhtiar N, Hussain T, Iqbal M, Malik AM, Qureshi AH, Hussain A. Hepatitis B and C single and co-infection in chronic liver disease and their effect on the disease pattern. *JPMA*. 2003;53(4):136-40.
10. Mele A, Corona R, Tosti ME, Palumbo F, Moiraghi A, Novaco F, et al. Beauty treatment and risk of parenterally transmitted hepatitis: results from the hepatitis surveillance system in Italy. *Scand J Infect Dis* 1995;27(5):441-4.
11. Shah HB, Dar MK, Jamil AA, Atif I, Ali RJ, Sandhu AS, Usmani AQ. Knowledge, attitudes and practices of hepatitis b and c among barbers of urban and rural areas of rawalpindi and islamabad. *JAMC*. 2015;27(4):832-36.
12. Foundation T. Hepatitis B Vaccine Information from Hepatitis B Foundation: [Internet]. 2016 [cited 23 March 2020]. Available from: http://www.hepb.org/hepb/vaccine_information.htm
13. Walker BR, Colledge NR, Ralston SH, Penman ID. Davidson's Principles and Practice of Medicine. 22nd ed. New Delhi: Elsevier Limited; 2013:948-52.
14. Wai CT, Lok AS. Treatment of hepatitis B. *J Gastroenterol*. 2002;37(10):771-8.19.
15. Jafari S, Buxton JA, Afshar K, Copes R, Baharlou S. Tattooing and risk of hepatitis B: a systematic review and meta-analysis. *CJPH*. 2012;207-12.
16. Mujeeb SA, Pearce MS. Temporal trends in hepatitis B and C infection in family blood donors from interior Sindh, Pakistan. *BMC infectious diseases*. 2008 Apr 10;8(1):1.
17. Akbar N, Basuki B, Mulyanto, Garabrant DH, Sulaiman A, Noer HM. Ethnicity, socioeconomic status, transfusions and risk of hepatitis B and hepatitis C infection. *J Gastroenterol Hepatol*. 1997;12(11):752-57.
18. Dickson RC, Everhart JE, Lake JR, Wei YU, Seaberg EC, Wiesner RH, et al. Transmission of hepatitis B by transplantation of livers from donors positive for antibody to hepatitis B core antigen. The National Institute of Diabetes and Digestive and Kidney Diseases Liver Transplantation Database. *Gastroenterology*. 1997 Nov 30;113(5):1668-74.
19. Toukan AU, Sharaiha ZK, Abu-EI-Rub OA, Hmoud MK, Dahbour SS, Abu-Hassan HA, et al. The epidemiology of hepatitis B virus among family members in the Middle East. *Am J Epidemiol*. 1990;132(2):220-32.
20. Hagan H, Jarlais DC, Friedman SR, Purchase D, Alter MJ. Reduced risk of hepatitis B and hepatitis C among injection drug users in the Tacoma syringe exchange program. *AJPH*. 1995;85(11):1531-7.
21. 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 Sep;52(9):398-402.
22. Polakoff S. Acute hepatitis B in patients in Britain related to previous operations and dental treatment. *Br Med J (Clin Res Ed)*. 1986;293(6538):33-6.