



The Prevalence of Hepatitis-B and Hepatitis-C Virus Infection in Selected Areas of Northern KP, Pakistan

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ABSTRACT

Hepatitis B virus (HBV) and Hepatitis C viruses (HCV) are associated with severe liver diseases, including liver cancer and end-stage liver cirrhosis disease. The prevalence of HBV and HCV varies from one part to another in Pakistan. However, very limited published data is available related to the prevalence of HBV and HCV. Herein, we studied the prevalence rate of HBV and HCV infected patients in selected Northern areas of KP Pakistan. We collected and examined 850 suspected patient samples for hepatitis from two medical centers including, District Headquarter Hospital Bannu and Khalifa Gul Nawaz Teaching Hospital District Bannu from January 2023 to June 2023. Patients of both sexes who were more than 10 years old were screened using the Rapid Testing Method for the presence of HBV and HCV, and the results were validated using an ELISA kit. Just 46 samples out of 850 were positive, meaning that the proportion of suspicious samples was 5.41%. Males showed a higher infection ratio of 3.88% among 33/850. HBV was 39.3% (13/33) and HCV was 60.6% (20/33) in the positive sample of men 33/46. Similarly, out of the 13/46 total positive cases of HBV and HCV, we revealed that the infection ratio for women was (13/850) 1.529%. By comparative analysis, we found that among 13/46, HBV was (5/13) 38.4% and HCV was (8/13) 61.5%. According to age-wise prevalence, the group of people aged 31 to 40 had the greatest prevalence rate (33%) followed by the group of people aged 21 to 30 (26%) in terms of prevalence. We also observed a decreased rate of infection in Kohat by comparing the HCV data from the District Bannu to other areas.

Keywords: HBV, HCV, Prevalence, Selected Northern Areas, ELISA, Rapid Testing Method

INTRODUCTION

Several major variables, including hepatitis C and B viruses, can lead to serious liver disorders, such as end-stage liver cirrhosis disease and liver cancer (Alberts et al., 2022; Wangenstein & Chang, 2021). Hepatitis B and C viruses were for the first time reported and identified in 1963 and 1988 respectively (Blumberg, 1977; HL, 2001). According to an estimation from the World Health Organization (WHO), 350-400 million people worldwide are infected with chronic HBV infections, and 170 million people are infected with chronic HCV infections (Lavanchy & Kane, 2016; Salari et al., 2022).

It has been estimated that annually, 563,000 and 366,000 deaths in humans are associated with HBV and HCV, respectively (Shaikh, Aaqil, Kumar, & Basit, 2023). Both viruses are associated with chronic liver diseases (CLD), liver cirrhosis, and liver carcinoma (HCC). 10% of HBV patients are predicted to develop CLD, 20% to develop liver cirrhosis, and 80% have HBsAg, increasing the risk of developing HCC by 25% to 40%. About 20–25% of HCV patients are at risk of developing HCC, 10-15% acquire cirrhosis of the liver, and 70–85% of patients get CLD (Rantala & van de Laar, 2008).

The prevalence of HBV and HCV infection varies among Pakistani populations from various parts of the country. HCV and HBV ultimately transmit using a similar pathway (Shah & Shabbeir, 2002). In Pakistan, 8.74 million individuals suffer from HCV and 4.55 million people suffer from HBV (Samo., et al 2021). In Pakistan, the prevalence of HBV and HCV may vary from 4.6% to 5.2% (Majid et al., 2010; Saeed et al., 2015). Owing to the paucity of published data on the Northern regions of KP, Pakistan, the rates of HBV and HCV infection fluctuate over time. Determining the prevalence of hepatitis B and hepatitis C infection in selected Northern regions of Khyber Pakhtunkhwa, Pakistan was the goal of this study.

MATERIALS AND METHODS

The collection of blood samples and isolation of serum for detection of HBV and HCV from the patients were performed at the District Headquarters Hospital Bannu and Khalifa Gul Nawaz Teaching Hospital District Bannu, KP, Pakistan from January 2023 to June 2023. The focus was on random patients belonging to selected Northern areas of KP Pakistan. A total of 850 suspected patients for HBV and HCV including both males and females of 10 years and above the age of 10 years were screened for the presence of HBV and HCV. The viruses were detected by Rapid Testing Method using Kits HCV Ab (HealGen), HBs Ag Rapid test Cassette serum/plasma Ref NO=L031-10231 and confirmed by ELISA (I CHROMAII.REF.FPRR021) technique.

RESULTS

The overall prevalence of HBV and HCV In suspected patients of the selected Northern areas of KP Pakistan

850 blood samples were collected from suspected patients at the Khalifa Gul Nawaz Teaching Hospital in District Bannu and the District Headquarters Hospital in selected Northern areas of KP. We observed that approximately 46 (5.411%) of the sample as a whole tested positive for both HBV and HCV. Among the 46 positive cases, we found that 33 were men and 13 were women. Our results showed that men were infected with 72% of all positive cases

while women were comprised on 28%. (Figure 1). Here, we have reported that, of the 46 positive cases, 28 had positive results for hepatitis C and 18 for hepatitis B.

The ratio of HBV and HCV in male suspected patients

Next, we examined the ratio of HBV and HCV in the infected men population. We found that a total of 33/850 (3.88%) males as Hepatitis positive, among

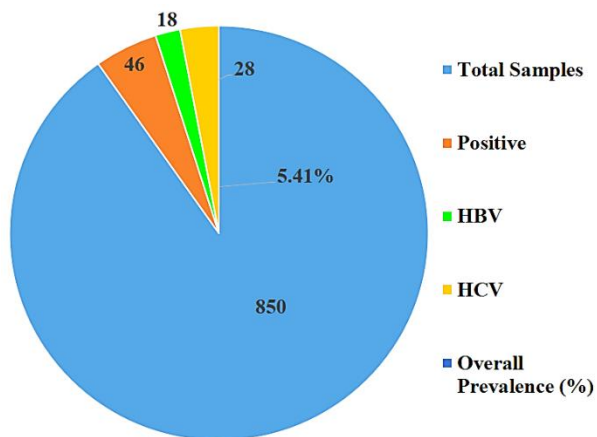


Figure-Error! No text of specified style in document.1. The overall prevalence of HBV and HCV in the selected Northern areas of KP Pakistan population.

13/33 (39.3%) were HBV positive whereas 20/33 (60.6%) were HCV positive (Figure 2).

The ratio of HBV and HCV in females among suspected patients of selected Northern areas of KP

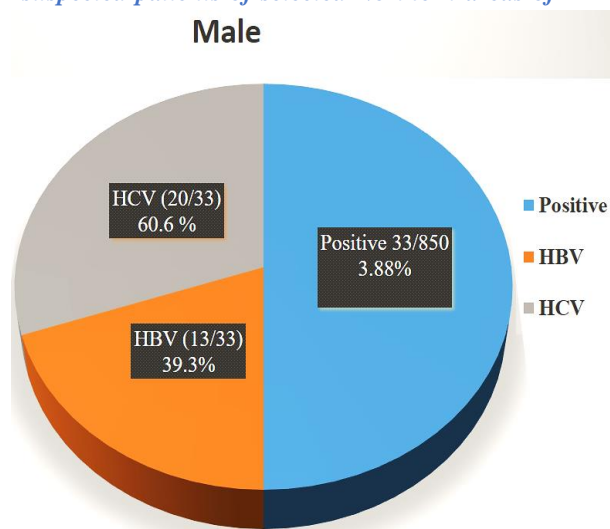


Figure -Error! No text of specified style in document.2 The prevalence of HBV and HCV among the men's suspected patients of selected Northern study area

Pakistan

Furthermore, we examined the prevalence of HBV and HCV among suspected female patients. We found that 13 out of 850 (1.529%) females had hepatitis; of the total positive cases, 5 out of 13 (38.4%) had HBV infection and 8 out of 13 (61.5%) had HCV infection as shown in Figure 3.

The total prevalence of HBV and HCV among suspected patients of selected Northern areas of KP Pakistan

Next, we examined the comparative ratio of HBV and HCV-positive cases among the total suspected and positive cases. We found that in a total of 46/850

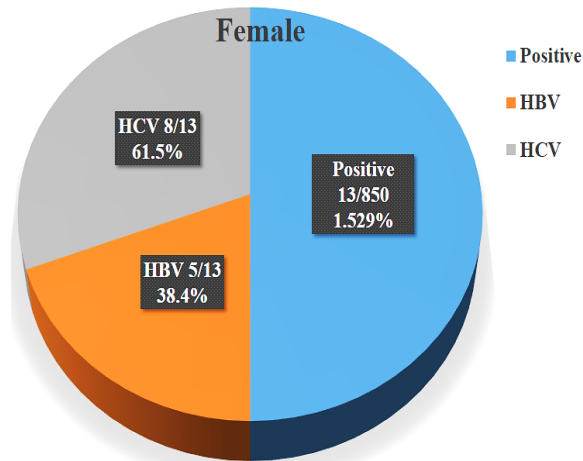


Figure - 3. Represents the prevalence of HBV and HCV among the women’s suspected cases of selected Northern KP study area.

(5.411%) positive cases most people were affected with HCV 28/850 (3.294%) by comparing to HBV 18/850 (2.117%) Figure 4. Therefore, our results suggest that HCV infection is more significant than HBV among suspected patients of the selected Northern areas of KP Pakistan.

Age-wise prevalence of HBV and HCV among suspected patients of selected Northern areas of KP Pakistan

Furthermore, we observed the age-wise infection of hepatitis. We further tabulated the total hepatitis cases on age-wise distribution which were comprised of 1-10 one case prevalence ratio of 2%, 11-20 seven cases prevalence of 15%, 21-30 twelve cases prevalence of 26%, 31-40 fifteen cases prevalence 33%, 51-60 three cases prevalence ratio 7%, 61-70 zero cases prevalence ratio 0%, 71 to 80 one case prevalence was ratio was 2 as shown in Figure 5. The age-wise comparison showed that people with an age range between 31-40 years had a 33% prevalence of hepatitis cases.

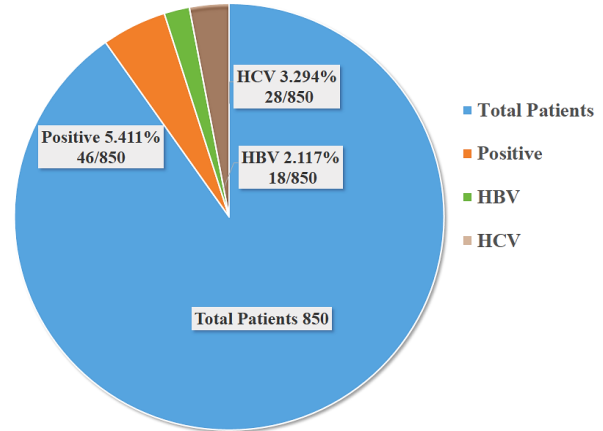


Figure -4 The total prevalence of HBV and HCV among the men and women in the population of the selected study

The area-wise prevalence of HBV and HCV among suspected patients of selected Northern areas of KP Pakistan

Next, we documented the area-wise comparison. Our findings showed that 17/46 (37%) hepatitis cases belonged to Bannu City whereas the same number also belonged to the NWA region. The Sara-e-Naurang area had the second highest prevalence with 4 (9%) hepatitis cases. We also noted that the prevalence of hepatitis in other selected areas of Northern KP Pakistan including Domail HBV 00 and HCV 02 (4%), Lakki HBV 01 and HCV 02 (7%), Karak HBV 01 and HCV 01 (4.3%) and Kohat HBV 01 and HCV 00 (2%) as shown in Figure 6. By comparing the HCV data of District Bannu to other areas, we found that Kohat showed a lower rate of infection.

DISCUSSIONS

HBV and HCV are among the life-threatening viruses that are associated with several serious liver complications, including liver carcinoma and end-stage chronic liver cirrhosis disease (Chacko & Samanta, 2016; Chuang et al., 2009). Due to its enormous population and its exposure to significant rates of co-infections, Pakistan is one of the most severely affected countries by HBV and HCV around the globe (Munaf et al., 2014). According to previously released data, during a four-year survey conducted at DHQ hospital in KP Pakistan from January 2004 to December 2008, 25944 patients were screened; 1352 of them tested positive for HBV and HCV, and the total percentage was 5.22% (Majid et al., 2010). Our study is supported by this previously published paper. Here, we investigated patients who may have had HBV or HCV.

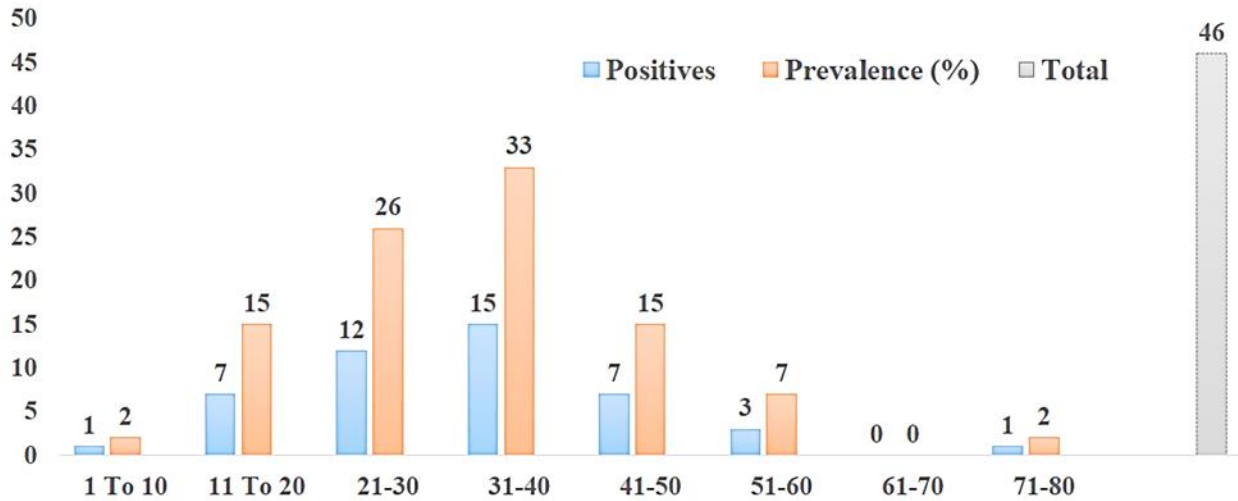


Figure -5. The prevalence of HBV and HCV in different age groups of the study area. The population aged between 31-40 years had the highest rate of infection followed by the age group of 21-30 years.

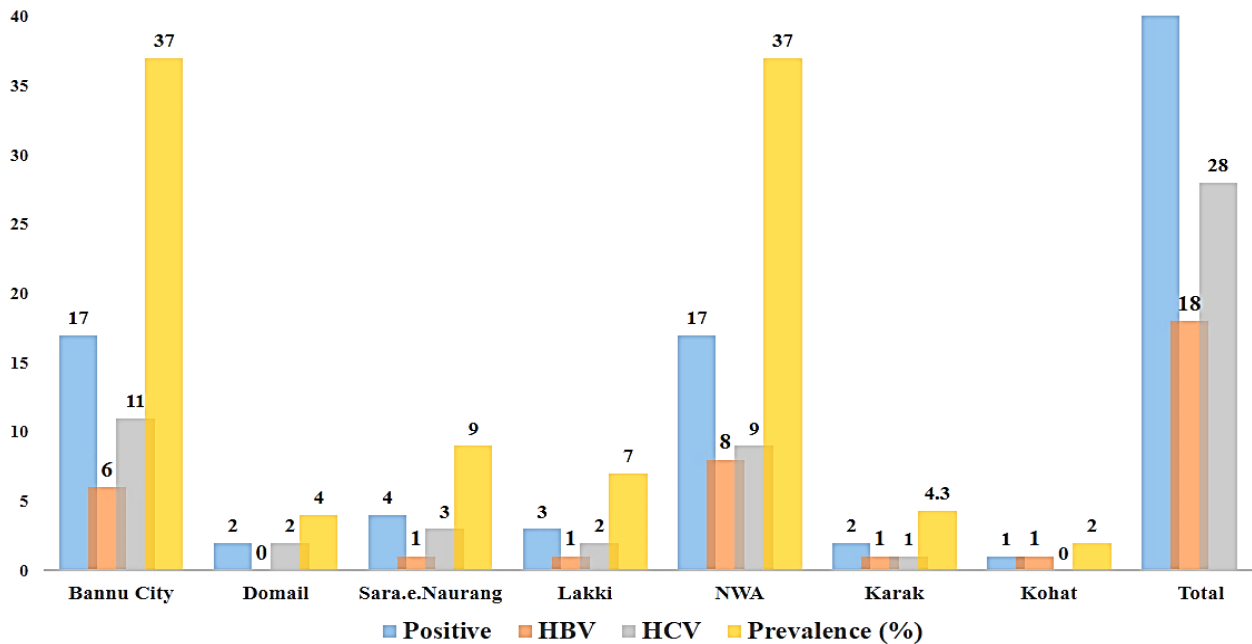


Figure -6. The prevalence of HBV and HCV in different age groups of the study area.

46 out of the 850 suspected hepatitis patients, we evaluated tested positive for both HBV and HCV, bringing the total prevalence to 5.44%. Herein, we found that Northern areas of Khyber Pakhtunkhwa, Pakistan had a higher number of Hepatitis B and Hepatitis C cases which indicated the lack of awareness among people regarding the prevention of Hepatitis B and C types. Next, we assessed the age factor, which highlighted the age group that comprised the majority of hepatitis cases. We found that between the ages of 31 and 40 had a greater prevalence of

hepatitis, which suggests that the youth of selected Northern areas of KP are mostly at risk for contracting the disease. We also noticed that the cases of Hepatitis C which is more threatening than Hepatitis B were higher in the KP region. During our investigation, we also observed gender differences, and we discovered that hepatitis B and C primarily affected men as opposed to women. Our current investigation was further supported by a prior study that found a higher incidence of hepatitis in men than in women (Baig, 2009). Male infection rates may be higher in part because of the frequency with which they get haircuts

and shave from barbers. According to reports, hepatitis can be transmitted by using contaminated hair salon equipment (Mutocheluh & Kwarteng, 2015). The current study has demonstrated that the population with age ranges between 31 and 40 years old (33%) and age group ranges between 21 and 30 years old (26%), is likely to have higher infection rates. The earlier published study provides support for this data (Majid et al., 2010). Among suspected patients, we found that city of Bannu has the highest infection rate (37%), followed by NWA (37%) and Sara.e. Naurang (4%). Kohat had the lowest rate (2%) of any place. This could be because, in comparison to other KP regions, Bannu City has a larger population and more frequent interactions with agents that cause hepatitis (Qamar et al., 2021). The current study showed a higher rate of HBV and HCV in the study area than the previously published data as given in (Majid et al., 2010). Certain risk factors such as chronic dialysis, injectable drug use, syringe usage, and blood transfusions can be linked to a higher prevalence of the illness. Users, workers in the medical field, barbershops' tainted razors, and home interactions with HBV and HCV patients (Mehmood et al., 2020; Samo et al., 2021). According to our research, there may be a correlation between these risk factors and the increased infection prevalence in the entire population of Northern KP, including Bannu.

CONCLUSIONS

According to the results of the current study, the general population in the selected Northern regions of Khyber Pakhtunkhwa, Pakistan, including the District Bannu, has a high prevalence of both HBV and HCV, with the highest positive ratio. In comparison to females, males were more susceptible to Hepatitis B and C. People of younger age were mostly under threat of Hepatitis B and C and also Hepatitis C was more prevalent than Hepatitis B. In the Northern regions of Khyber Pakhtunkhwa, Pakistan, healthcare providers and the general people must be made aware of the associated risk factors to control the infection. Our study recommended that vaccination, early diagnosis, and routine testing should be implemented throughout the KP region as treatment alternatives.

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AUTHOR CONTRIBUTION

Fahim Ullah Khan designed the project and wrote the manuscript. Muhammad Fahad designed the statistical graphs. Moheb Ullah Khan collected the data. Surayia Shahab Rani, Autif Hussain Mangi and Laiq Zaman checked the manuscript for grammar and correction.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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