

Evaluation of Hepatitis C Virus and Hepatitis B Virus infection in Drug Abusers

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ABSTRACT

Background: Pakistan is one of the world's uppermost burdens of hepatitis C and B. Our research will assist to enhance and update preventative and treatment methods across the country.

Methods: We screened 408 drug abusers for HBV and HCV in the medical and public health literature from study 1 June 2021 to 31 December 2021 on oral and injection drug users from Khyber Pakhtunkhwa Mardan District, Pakistan to evaluate the frequency of hepatitis B and C.

Results: Out of 408 half of the individuals were screened for HCV-specific antibodies 204 and 204 for HBV surface antigen by a one-step rapid immune-chromatographic test. For all those who were screened for HCV antibodies, 171 individuals were negative and 30 individuals were positive and 14 % prevalence was observed in drug-addicted individuals. All those were screened for HBV surface antigen 161 individuals were negative and 43 % individuals were positive and 21 % prevalence was observed in drug addicted individuals. According to Age –wise distribution the high prevalence was found between 17-30 years Age 57 % and then followed by the 31-45 years age group having 28 % and the lowest HBV infection was observed in above 45 years Age group was only 15 %. Among HBV 43 positive individuals 70 % were drug abusers while the rest 30 % were oral drug users. In HCV 30 positive individuals 76 % were drug abusers while the rest 23 % were oral drug users. Among drug abusers, an injection drug user infectivity rate of 72 % was high as compared to oral drug abusers' 28 %.

Conclusions: Our findings show that the prevalence of HCV and HBV is much higher among IDUs than in the overall population of Pakistan. Injecting drug users are at high risk of HBV and HCV infection transmission, and they can transfer diseases to the community through risky behavior such as syringe exchange and unsafe sex. As a result, various levels of prophylaxis are necessary for these fatal illnesses.

Keywords: Drug abuser, Hepatitis B virus, Hepatitis C virus, Pakistan.

INTRODUCTION

Individuals who inject drugs are a crucial population at great risk of hepatitis C virus (HCV) and Hepatitis B virus (HBV) infection¹. Addiction is a frequent, long-lasting, reoccurring psychosomatic and bodily disease that is characterized by usual and compulsive drug-looking for behavior and use, nevertheless of detrimental consequences. It is measured as a brain sickness as drugs alter the mind. They change the structure, plus function, and meaning of life. All these brain deviations can be lasting and can lead to numerous damaging and detrimental actions². HCV and HBV are blood-borne pathogens and most contagions occur through contact with blood from unsafe injection applies, unsafe health care system contaminated blood transfusions, injection drug use, and sexual intercourse that lead to contact with blood. HCV causes acute and chronic hepatitis infection. HCV is a worldwide predominant virus and a leading cause of death and illness³. Persistent HCV disease is concomitant with the progress of liver cirrhosis, liver failure, hepatocellular cancer, and death⁴. Approximately 60 % to 80 % of acute hepatitis infections persist and develop chronic hepatitis C infection⁵. HCV is classified into seven different genotypes with 67 subtypes⁶. Countless infected peoples, still, are unknown to the healthcare organization as they may be asymptomatic for years and have not been diagnosed with HCV⁷. The highest prevalence of chronic hepatitis C regions is in Africa and the east Mediterranean while the areas having a low prevalence of hepatitis C are, Australia, the Americas, and Western Europe. HCV and HBV are profoundly linked with intravenous drug users who are exceedingly prone to the transmission of HBV and HCV over sharing sharps like infected needles and syringes⁸.

Though the incidence of HCV infection is dissimilar for distinct countries in Asia, its collective prevalence is valued to be somewhat more than 2%. Egypt surpasses all other countries by approximately 14% while Pakistan has 10 million persons in Pakistan are infected with HCV infection, constructing it a country with the next topmost HCV burden following Egypt⁹.

Both HCV and HBV are major health concerns among

intravenous drug users. Injection drug users suffer from a variety of health issues, including mental illness and HIV, necessitating the care of many healthcare specialists. In the United States, approximately 0.8-1.4 million people are infected with HBV, whereas 2.7-3.9 million people are infected with HCV¹⁰. In 2007, it was estimated that there were approximately 15.9 million injecting drug users worldwide, including 3 million living with fatal HIV infection. Since the beginning of HIV's prevalence, addiction and drug usage have been intricately linked¹¹.

The epidemic is spreading among injectable drug users, with an estimated frequency of 20%. Infection rates in most major cities range from 15% to 50% among Pakistan's estimated 150,000 injecting drug users, according to national surveillance data⁹. The prevalence of hepatitis C virus infection among intravenous drug users in Pakistan is 57.7%, whereas, in China 1.6, the United States 1.5, and in Russia, less than 1.3 million people were infected with HCV¹². HBV spreads rapidly via sexual, parenteral, and vertical routes¹³. HCV was also found to be prevalent among non-injecting drug users, heroin, cocaine, crack, smokers, and methamphetamine users¹⁴. This study was conducted to determine the Hepatitis B and C virus infection among drug abusers.

MATERIALS AND METHODS

This cross-sectional was carried out from study 1 June 2021 to 31 December 2021 on oral and injection drug users from Khyber Pakhtunkhwa Mardan District, Pakistan. The primary data collection was completed by convenient sampling data collection was done by a pre-designed questionnaire to reading the risk factors for HBV and HCV infection. In this study, 408 drug addicts were included. Injecting drug users from Lahore was included. Among these 408 patients, 204 screened for HCV and 204 for HBV. A current study was carried out to estimate the prevalence of HBV and HCV among drug abusers among the resident of the district Mardan KPK Pakistan. All testers were processed at Hi-Tech clinical Laboratory Shewa Adda Swabi KPK Pakistan for AntiHCV and AntiHBV antibody detection through Hepatitis C Virus

One Step Test Device (Serum/Plasma).

For the qualitative detection of HCV antibodies in plasma or serum, a fast, single-step examination is performed. Device for the HCV Single Step Test Kit. A cross-flow chromatographic immunoassay based on the dual antigen-sandwich method is used in the test kit Serum or Plasma. On the test mark region of the kit, the membrane is coated with recombinant HCV antigen. During the sample flow, serum or plasma reacts with the HCV antigen-covered particles. The combination then moves upward on the membrane chromatographically via capillary action to react with recombinant HCV antigen on the strip membrane, resulting in the formation of a darkened mark. The presence of this colored line indicates a favorable outcome, whereas its absence indicates a bad outcome. In the control zone, a colored mark will always appear, showing that the test kit and sample are accurate.

First of all, we were allowed all the materials specimen, test device, and buffer to equilibrate to normal room temperature at 15-30 °C before testing. Initially remove the test from the pouch. Then place the test kit on a clean and non-vibrated surface. In 3rd step, we added one drop of serum through the dropper and one drop of 3. Set up a timer and waited for colored marks within 15 minutes.

Positive: In case of a positive result both lines appear. One control and the other test line. C means the control line while T is for the test.

Negative: One control line(C) colored line appears.

No line Invalid: If the Control line fails then test procedure, insufficient specimen volume, or any other techniques error.

All the data were analyzed through Microsoft Excel 2020. Mean and standard deviation was shown as descriptive data.

RESULTS

A total of 408 drug abusers were included in this study, out of 408 half individuals were screened for HCV-specific antibodies 204 and 204 for HBV surface antigen by one step rapid immunochromatographic test. For all those who were screened for HCV antibodies, 171 individuals were negative and 30 individuals were positive and 14% prevalence was observed in drug-addicted individuals.

Table 1: HCV and HBV prevalence in Drug Abusers

Number of Screened drug abusers for HBV	Number of HBV Negative Individuals	Number of HBV Positive Individuals	Percentage of HBV Positive drugs abuser
204	161	43	21 %
Number of Screened drug abusers for HCV	Number of HCV Negative Individuals	Number of HCV Positive Individuals	Percentage of HCV Positive drugs abuser
204	174	30	14 %

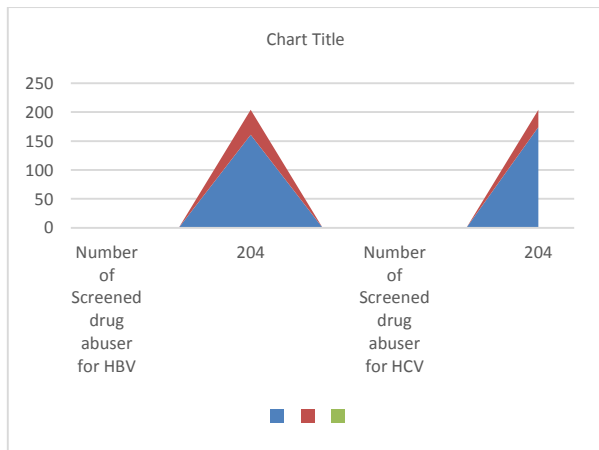


Figure 1: HCV and HBV prevalence in Drug Abusers

A total of 204 were screened for HBV infection. Among these 43 individuals were positive HBsAg. According to Age –wise distribution the high prevalence was found between 17-30 years Age 57 % and then followed by the 31-45 years age group having 28 % and the lowest HBV infection was observed in above 45 years Age group was only 15 % result shown in Table 3.2.

Table 2: Age-Wise Prevalence of HBV Infection

Age Group Name	Age Ranges	Number of Positive HBV Cases (40)	Percentage of positive individuals
Young adults	17-30	23	57 %
Middle aged-adults	31-45	11	28 %
Old adults	Above 45	6	15 %

A total of 204 were screened for HCV infection. Among these 30 individuals were positive HCV. According to Age –wise distribution the high prevalence was found between 17-30 years Age 46 % and then followed by the 31-45 years age group having 24 % and the lowest HBV infection was observed in above 45 years Age group was only 30 % result shown in Table/Figure 3.3.

Table 3: Age-Wise Prevalence of HCV Infection

Age-wise	Age Ranges	No. of HCV Positive Cases (30)	Percentage of positive individuals
Young adults	17-30	14	46 %
Middle aged-adults	31-45	7	24 %
Old adults	Above 45	9	30 %

In this study total of 408 drug abusers were screened for HBV and HCV infection. Out of 408 abusers, a total of 70 positive tests. Among HBV 43 positive individuals 70 % were drug abusers while the rest 30 % were oral drug users. In HCV 30 positive individuals 76 % were drug abusers while the rest 23 % were oral drug users. Among drug abusers, an injection drug user infectivity rate of 72 % was high as compared to oral drug abusers at 28 %.

Table 4: Route-Wise Prevalence of HBV and HCV

S.No	Total Number	Oral Drug Abuser	Parental Drug Abuser
1	Total number of HBV-positive Drug Abuser patients (40)	12 (30 %)	28 (70 %)
2	Total number of HCV patients (30)	7 (23 %)	23 (76 %)
3	Total Number of HBV and HCV Patients 70	19 (28 %)	51 (72 %)

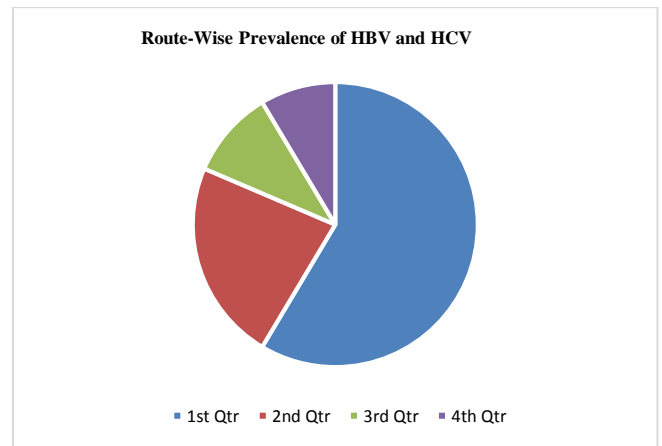


Figure 2: Route-Wise Prevalence of HBV and HCV

DISCUSSION

Of all those who were screened for HBV surface antigen, 161 individuals were negative and 43 % of individuals were positive and 21 % prevalence was observed in drug-addicted individuals as result shown in (Figure/Table 3.1). The finding of this study is closely similar to a study conducted by Ahsan et al., 2019¹⁵ and the prevalence was 17 % general population. The current study of the prevalence of hepatitis in drug abusers is quite high as compared to a study conducted in 2020 that reported that the general population prevalence was 4.8%¹⁶. Another study also reported the HCV frequency at 6.2 % amongst the overall population¹⁷. This study's finding regarding the prevalence of HCV prevalence is similar to a study conducted on drug abusers by drug abusers¹⁸. As we compared this study to a study conducted by Akhtar et al., 2016¹⁴ in Lahore Pakistan on IDUs were found to be 36.09% HCV positive.

Another study reported by Waheed et al., 2009¹⁸ observed that the prevalence of HCV among IDUs was very high 57±17.7% as compared to this current study. A study reported from Lahore Pakistan reported the prevalence of HCV at 34.3 % HBV 3.2 % in drug users¹⁰. The current study finding was also very low as compared to a study conducted by Shine et al., 2010¹⁹ that reported a very high prevalence of HCV 65.4 % in drug abusers. In the current study, the prevalence of HCV is the same proportion as shown in a study conducted in Nawab-shah, Sindh, Pakistan which was 14.3% HCV, While HBV prevalence is very high in our finding as compared to said study 6.7 %²⁰.

The current study finding was disagreement regarding the age-wise distribution of HBV infection in the general population which was a moderate rate in the age group 21-40, with the Highest prevalence in the age group of 41-60²¹. Another study reported the same proportion of HBV infection rate of 39.27% in the age group of 16 to 30 years and a lower infection rate of 4.93 in the more than 60 years age group²². In a study conducted on a total, of 523 partakers, among these, the highest prevalence was observed in the 41-50 years age group²⁰.

Our study reports regarding HCV prevalence age-wise was similar to a study conducted by Haq et al., 2013²³ also reported that HCV is common in individuals aged > 30 ages. Another study reported on IDUs reported that the highest number of HCV-positive patients were found in the 17-30 years age group¹¹. A similar study reported, that in the general HCV-positive cases, the age group of 25 years was more frequently infected with HCV²⁴. A study reported on investigative the seroprevalence in various age groups, a significantly in height frequency was observed within the 41-60 years age group¹⁵.

A study reported on Prevalence and Risk Factors for HCV and HBV has shown that route-wise prevalence in the general population was 50% for HBV and whereas the frequency of HCV was 45 % in IDUs²⁰. The current study finding was very similar regarding the route-wise prevalence of infection among drug abusers to a study conducted by Ahsan et al., 2019¹⁵ reported that over 80% of the tested IDUs were found positive for anti-HCV. Another study also reported that HCV and HBV infection were high IDUs as compared to oral drug users²⁵.

CONCLUSION

Our findings show that the prevalence of HCV and HBV is much higher among IDUs than in the overall population of Pakistan. Injecting drug users are at high risk of HBV and HCV infection transmission, and they can transfer diseases to the community through risky behavior such as syringe exchange and unsafe sex. As a result, different levels of prevention are required for these fatal illnesses.

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