



Original Research

Epidemiology of Hepatitis C Virus in District Swat, Khyber Pakhtunkhwa Pakistan

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Abstract

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Background/Objectives: Globally, between 64 and 103 million people are chronically infected. Major risk factors for this blood-borne virus infection are unsafe injection drug use and unsterile medical procedures (iatrogenic infections) in countries with high HCV prevalence. In regions with high HCV prevalence, improper injectable drug use and unsterile medical procedures (iatrogenic infections) are major risk factors for this blood-borne viral infection. The aims of this study to investigate the prevalence of hepatitis C in District Swat. **Methods:** The zone which was investigated in my examination work is the Swat region. The data was collected for research through surveys and questionnaires. The statistical technique of data collection was done by simple random sampling. A total of 300 subjects from each tehsil were selected randomly. The sample was collected for serum test of HCV. All statistical analyses were performed using GraphPad Prism 6.0 (GraphPad Prism Software, San Diego, CA) one-way analysis of variance (ANOVA). **Results:** The maximum prevalence was in the age groups of 41-50, 51-60, and 61-70 in both urban and rural areas. The major risk factors associated with HCV were Poor proficiency, low financial status, and poor sterile condition, incorporate intravenous medication misuse, hemodialysis, transfusion of blood items, inking, over sexual conduct, introduction to social insurance and organ transplants from HCV-positive contributors, and utilization of blood tainted straws for cocaine grunting. **Conclusion:** The incidence of HCV in the rural and urban areas of district swat has risen significantly over so many years. My survey shows more incidence of HCV as compared to previous studies done in Pakistan. In our study, HCV is more prevalent in an urban area (Babozai) of district swat.

Introduction:

Morbidity and mortality caused by the Hepatitis C virus (HCV) significantly impact healthcare systems globally. While viral hepatitis is the seventh largest cause of mortality worldwide, it is the fifth major cause of death in the Middle East and North Africa (MENA), attributed mostly to HCV infection¹. High levels of HCV antibody prevalence are seen in a few MENA countries, most notably Pakistan (4.8%), and Egypt (14.7%). Recent key advances in HCV therapy, such as Direct Acting Antivirals (DAA), have presented good hopes for lowering HCV transmission and disease burden².

Globally, between 64 and 103 million people are chronically infected. Major risk factors for this blood-borne virus infection are unsafe injection drug use and unsterile medical procedures (iatrogenic infections) in countries with high HCV prevalence³. Projection demonstrates that 3-4 million individuals are currently infected every year, 170.0 million people are long-lasting infected and are at high risk of developing liver sickness including cirrhosis and cancer of liver cells and 350,000.0 deaths happen every year because of all HCV-related causes. Historically a few nations in Africa and Asia have the most elevated stated anti-HCV (antibodies to HCV) incidence, though industrialized nations in North America, Western Europe, and Australia are known to have a low frequency of HCV⁴.

Regardless of numerous nations in Asia having a low to intermediate incidence of HCV, half of the individuals on the planet who are infected with HCV live in this area⁵. Hepatitis C virus in Pakistan is exceptionally endemic, with around 06.8% of the overall populace infected with HCV. Roughly 06% of the number of inhabitants in Pakistan are effectively infected with HCV⁶. India, Pakistan, and Bangladesh have the maximum rate of contamination, with an incidence range from 2-8% in various populace groups⁷. The most elevated pace of HCV is found in Punjab 6.7% and the least rate is accounted for in Khyber Pakhtunkhwa which is 1.1%. The recurrence of HCV in Sindh is 5% whereas in Baluchistan is 1.5%⁸.

HCV is mainly blood-borne and transmission occurs by injection with unsterilized needles in drug use or medical settings, unscreened blood transfusion, organ transplantation, and maternal-fetal vertical transfer by sexual activity⁵. In this way, different courses of transmission, for example, sexual or family presentation to a contaminated contact are hypothesized but not broadly acknowledged. This is because clashing information has risen concerning the nearness of HCV in body liquids other than blood. A few creators have discovered absolute nonattendance of the infection in sperm, spit vaginal discharges, and other body liquids⁹. Conduction course of HCV is basically through an introduction to debased blood and blood items like sharing syringes and needles (93%), sexual contact with the tainted injured individual (82%), and liquor admission (61%) in various districts of Pakistan¹⁰. Vertical transmission accounted for the most unmistakable among youthful people for HCV¹¹.

In this infectious disease the liver becomes initially infected by Hepatitis C infection, infection in chronic stages is as often as possible and has no symptoms in nature. However, in constant cases, it leads to liver fibrosis and eventually cirrhosis which at last came to other

complexities of the liver, for example, hepatic failure and liver cancer. HCV infection is strongly related to cirrhosis, liver tumor growth, and end stages of liver disorder need transplantation¹².

Patients with acute hepatitis C are usually asymptomatic. Most studies have reported high (77-85%) rates of progression from acute to chronic hepatitis C, but the transition from acute disease to cirrhosis is usually symptom-free and occurs over 20-40 years in approximately 5-25% of HCV infected patients. Hepatocellular carcinoma may develop in as many as 1-4% of patients with established cirrhosis per year. HCV diseases lead to severe Hepatitis in 20.0% of cases and acute Hepatitis in half of the cases, 20.0% of who developed cirrhosis¹³. The initial half year after exposure to the Hepatitis C virus is regarded as severe hepatitis C (AHC)¹⁴. Most generally, severe hepatitis C virus disease is characterized as the half-year period following the procurement of the hepatitis C virus¹⁵.

Severe hepatitis C virus disease is rarely diagnosed because most severely infected people have no symptoms. In the transfusion setting, where the severe beginning of HCV infection has been best recorded, 70 to 80% of cases had no symptoms. Around 20 to 30% of adults with severe HCV disease may create clinical signs. The beginning of signs happens from 3 -12 weeks afterward exposure. Symptoms might involve malaise, body weakness, anorexia, and jaundice. The rise of serum alanine aminotransferase levels happens 2 to 8 weeks after exposure and mostly arrives at the greatest level than 10 times the optimum range. HCV RNA can be detected in the sera 1 to 2 weeks after exposure. The range of HCV RNA elevated quickly during the first couple of weeks and then reached between 105 and 107 IU/mL, shortly before the ultimate range of sera amine transferase range and beginning of clinical signs¹⁶.

Severe HCV infection can be fatal, yet fulminant Hepatic failure is unusual¹⁷. Moreover, most severely infected patients can't remind a time when they have severe symptoms. At the point when patients develop severe HCV disease symptoms, the clinical signs normally look like those that happen with different kinds of viral hepatitis fatigue, myalgia, low-level fever, jaundice, dull urine, vomiting, right upper quadrant aching¹⁸ sign may comprise of malaise just, without jaundice or gastrointestinal signs¹⁹.

The change from acute liver disorder to cirrhosis includes inflammation, initiation of hepatic stellate cells with resulting fibrogenesis, angiogenesis, and parenchymal annihilation injuries brought about by vascular impediment. Imaging via CT, ultrasonography, or MRI of an unpredictable and nodular liver together with weakened liver engineered capacity is sufficient for the analysis of cirrhosis. Different findings incorporate little and contracted liver, splenomegaly, and proof of portosystemic pledges. A liver biopsy is only here and there required yet investigation of an example can give a definitive determination and confirm the etiology in instances of vulnerability²⁰.

The absence of repetitive serological screening preceding medical procedure is the charge of expanded transmission. Poor proficiency, low financial status, the poor sterile condition has likewise suggested in the predominance of

Hepatitis C. Hazard factors for HCV disease include intravenous medication misuse, hemodialysis, transfusion of blood items, inking, over sexual conduct, introduction to social insurance, and organ transplants from HCV-positive contributors and utilization of blood tainted straws for cocaine grunting²¹.

²² worked on the reproducibility of transient elastography in the evolution of hepatic fibrosis in a patient with long-lasting hepatic infections. By performing 800 transient elastography (ET) with an indeterminate result of 02.4%. The total inter-observer agreement ICC-intra-class correlation coefficient was 0.98. Using the reviewer operating characteristic curves, 3 diagnostic TE thresholds were identified as greater than 7.9 KPa for F greater or equal to 2, greater than 10.3, greater or equal to 3, and greater than 11.9 for F=4. The TE value assessed by the 2 raters fell within the same cut of fibrosis. The study predicted that TE is highly reproducible.

²³ declared the epidemiology of HCV infection. It is found that 130 to 170 million individuals are infected with hepatitis C globally. According to data of blood donor survey Africans and eastern Mediterranean report high prevalence rate of HCV greater than 10%. Data from CDC surveillance systems show that the incidence of acute hepatitis C has declined since the 1980s. In 2005 such cases are reported in northern America and Europe among young adults due to injection of drugs other modes like exposure to blood, sexual activity, and tattooing are responsible.

²⁴ studied the hazard factors and clinical presentation of HCV infections. Out of 100 patients with the age of 46.86 ± 13.15 years, 70 were male and 30 were female examined through questionnaires 50% patients from rural areas. HCV infection was common in farmers, housewives, teachers, students, and health care providers. The study determined that mass awareness programs are needed through electronic and print media.

In gynecology, a cross-sectional study was conducted on pregnant women. ²⁵ carried study on frequency and hazard factors for HCV among pregnant women. For investigation 2050 pregnant women were tested for anti HCV. In this way, 103(5%) were positive for anti HCV and 1947(95%) anti HCV-positive women had no risk factors. The study revealed that hepatitis C is a common infection among pregnant women.

²⁶ examined hepatitis C virus infection. 18,274 blood samples were collected from asymptomatic blood donors at age of 15-59 years. So, the overall HCV-positive cases Male were more prevalent at the age of 31-40 years in blood group B. Study concluded that HCV is an asymptomatic infection and can easily lead to chronic status. ²⁷ carried study on the incidence of HCV in young orphan students of Swat. They examined 175 samples within the age group 5-17 years of which 109 were males and 66 were females. At first, samples were studied by immunochromatographic assay (ICT) and then subjected to PCR for further confirmation. 61 (34.84) subjects were found positive for HCV by ICT strips having 20 males and 11 females. The prevalence rate was recorded at 17.71% for HCV. The aims and objective of this study are to find the incidence rate of HCV in Tehsil Kabal and Babozai. The variables include comparing HCV patients in urban and rural areas of presented Tehsil and determining the effect of HCV in peoples of different ages and gender.

Materials and Method:

Study Area:

The zone which was investigated in my examination work is region Swat. Swat is an appealing valley, which located between 34° 34" and 35° 55" North scopes and 72° 08" and 72° 50" East longitudes, limited by Ghizer and Chitral on the North, Indus Kohistan, and Shangla on the East, Buner, and Malakand are situated on toward the South and Dir, shielded it from the West and situated in the lap of precipitous reaches. The all-out zone of local Swat is 5337.0 km square and establishes a populace of around 2,309,570.0 as per the 2017 evaluation, making it the 3rd biggest region of KPK after Peshawar and Mardan.

Data collection:

The exploration was conducted from the start of November 2018 till the last of April 2019. The data was collected for research through surveys and questionnaires. The statistical technique of data collection was done by simple random sampling. By using a statistical formula. Data were collected from different localities of tehsil Babozi and Kabal based on the population. A structured questionnaire was filled out by each individual which include age, gender, locality HCV patient in family history, surgery, dental treatment, blood transfusion, anti HCV vaccination, past viral infection, drug history, recent medication, a genetic disease in the family, living conditions and occupation. All the samples were tested in the laboratory to find out the percentage of positive cases. The method was used to analyze the data. The percentage was computed for categorical variables like age group, gender, and total percentage. The sample was collected from a different site. After the blood was collected in the syringe it was transferred into an EDTA tube and was placed in an icebox with -20 centigrade before performing a serological test. The blood was transferred to the diagnostic laboratory where the tubes were centrifuged at 10,000 RPM for 10 minutes.

Data Collection through Questionnaire:

I collected data through a questionnaire, consisting of variables such as age, gender, locality, and test status (either positive or negative) from different villages.

Sample collection:

Samples are taken from different labs (Anwar lab, Swat medical complex lab., TSMH Clinical lab. and Micro clinical lab.). The sample was collected using 70 % ethanol-soaked cotton to disinfect the epidermis where the vein was clear and easy for blood collection. The region above the elbow was tight with a belt wrapped around it. The syringe needle was injected into the vein and about 3-4 ml of blood was taken and was carefully removed.

Serum Tests:

Serum tests (Anti-HCV Immuno-Chromatography test) were also performed in my study. After the serum separation, two drops of serum and one drop of buffer (supplied with the kit) were put onto serological strips. The reading was recorded after five minutes.

Statistical Analysis:

All experiments are representative of at least three independent replicates. Data are presented as the mean ± standard error of the mean. All statistical analyses were performed using GraphPad Prism 6.0 (GraphPad Prism

Software, San Diego, CA) one-way analysis of variance (ANOVA)

Results:

Incidence of HCV in Different Gender:

The gender-based study shows that there are 33.5% positive cases of male while 26.8% positive cases of female and the total percentages of both male and female are 30.33% in tehsil Babozai by taking the sample of 300 we have 164 male samples and 134 female samples, in the male sample there are 55 positive cases and 111 negative cases of HCV, while in female 209 are negative and 91 are positive. Gender-wise study show that there are 30 positive cases out of 232 and 201 are negative and positive percentage is 12.9% of male while in female there are 21 positives out of 68 and 48 are negative and positive percentage is 30.8%. The total positive HCV percentage of Tehsil Kabal is 17%. The incidence of HCV in gender-wise distribution showed in fig.1&2.

Incidence of HCV in Different Age group:

The age-wise table shows that the Incidence rate of HCV in tehsil Babozai at the age of 11-20 has just 1 positive case and 20 negative cases of HCV and the percentage of this incidence is 4.76%. At the age of 21-30, 80 samples are positive while 26 samples are negative and the percentages are 75.4%. Age between 31-40, there are 19 cases of negative while 49 are positive cases and the percentage become 27.9%. Age between 41 and 50 conveys that there are 17 positive samples and 27 are negative samples while the percentage is 38.6%. Age between 51-60 shows 45.4% of positive HCV from the collected samples of 300 which have 18 negatives while 15 positives. The age from 61-70 shows the high HCV positivity in this age 28 samples are collected in these 17 are positive while 11 are negative and the percentage is 60.7%.

The incidence of HCV in age-wise distribution showed in fig.3&4. The age-wise table shows that at the age of 11_20 there are 3 cases are positive while 66 are negative out of 69 so the positive percentage is 4.34%, The age between 21_30 reveals that out of 127, 9 cases are positive while 118 are negative the positive percentage is 7.08%, The age of 31 to 40 displays that there are 15 positive patients of HCV and 45 negative cases out of 60 cases and their percentage becomes 25%, the study of 41 to 50 age conveys that 10 cases are positive and 11 cases are negative out of 21 cases and percentage of positive HCV is 47.6%. Age from 51_60 demonstrated that the positive cases of HCV are 6 while the negative cases are 11 out of 17 samples and the percentage is 35.2%, from the age of 61-70 6 samples were tested which concluded that 3 cases are positives and 3 are negative cases having the percentage of 50% each.

Incidence of HCV in Different Areas:

The area-wise tables reveal the incidence of HCV in tehsil Babozai. In Mingora collected samples are 78 which has 15 positives while 63 are negative and the positive percentage is 19.2%. The collected samples of Shagai shows the positivity of 12 Individual while there is 48 negative individual and the percentage of this positivity is 20%. Amankot shows a positive rate of HCV from the samples there is 16 positive Individual while 40 individuals are negative and their percentage is 28.5%. on the other hand, Saidu has a percentage of 20.7%, total

samples are 53, positive cases 11 and negative cases 42. Faizabad incidence of HCV is 15% by taking total samples of 53, which have 45 negative and 8 are positive HCV. Incidence of HCV in gender-wise distribution showed fig.5&6.

The positive comparative ratio between the two tehsil shows the percentage of about 30.33% of Babozai and that of about 17% of Kabal. Hence, the Babozai percentage is high as compared to that of Kabal tehsil.

Discussion:

The incidence of HCV was predominant in males which about 33.5% and lower in females that is about 26.8% in Tehsil Babozai while 12.9% male and 30.8% female were recorded from Tehsil Kabal and Babozai is an urban area male exposure is high as compared to female while Kabal is a rural area due to poor hygienic condition female incidence rate of HCV is high than male. The incidence of HCV is greater in males (Babozai) as well as greater in females (Kabal) due to lack of vaccine and effective therapy, limiting transmission is a primary strategy for the prevention and control of HCV epidemics²⁸. A recent global systematic review of HCV prevalence and incidence in men who have sex with men (MSM) provides updated estimates that can guide community education and public health policy²⁹.

Age-wise distribution of HCV in Babozai 21–30-year age group and 61–70-year age group are greater incidences of HCV. If we analyze the data of Kabal age wise 40–50-year age group and 61–70-year age group greater incidence of HCV. This epidemiological study underscores the role injection of drug residue may play in HCV transmission among IDUs. This question deserves further investigation in the current context of the worldwide HCV epidemics. New or young injection drug users (IDUs) are the most at risk of HCV infection³⁰. According to my investigation, the high rate of positive HCV present at 61 to 70 is due to a weak immune system. The demographic survey suggests that the incidence of HCV is greater in Babozai areas like Amankot, Saidu, and shagai. In comparison, the incidence of HCV in Kabal is greater in Kabal main city, Bandai and Kalakaly. The positive cases are more in Kabal than Babozai because Babozai is a well-developed area and Kabal is a rural area so it has low socioeconomic status. By thinking about the huge populace of the nation, a predominance of 2.62% prompts a large number of positive patients, on the off chance that we accept that negative benefactors were not viremic. Along these lines, each blood transfusion conveys a potential hazard for transmission³¹ in comparison to my investigation the overall prevalence was 23.66% in both the selected Tehsils of District Swat (Babozai and Kabal) which is higher than Lahore. Because the people used unhygienic tools such as needles, razors, and surgical instruments.

In Pakistan anticipation of transfusion-transmitted diseases has been accomplished by lessening superfluous transfusions, utilizing intentional contributors, barring benefactors with explicit hazard elements, and precise screening of all blood for contamination. Although these mediations in Pakistan are connected, the danger of HCV diseases remains. With the accessibility of compelling treatments against HCV, doctors, specialists, and medicinal services chiefs need to improve endeavors, in

conclusion, the executives and avoidance of HCV in Africa. The moderately surprising expense of treatment implements the requirement for an orderly approach for this condition so assets are utilized most adequately³².

Conclusion:

The incidence of HCV in district swat's rural and urban areas has risen significantly over so many years. My survey shows more HCV incidence than previous studies done in Pakistan. In our study, HCV is more prevalent in an urban district swat area (tehsil Babozai). More prevalence of HCV shows may play a dramatic role in rising the incidence of HCV sexual contact and reuse of contaminated tools in urban individuals. In the present study, I observed that is a highly related risk factor of HCV. Poor proficiency, low financial status, poor sterile condition, intravenous medication misuse, hemodialysis, transfusion of blood items, inking, over sexual conduct, introduction to social insurance and organ transplants from HCV-positive contributors, and utilization of blood tainted straws for cocaine grunting.

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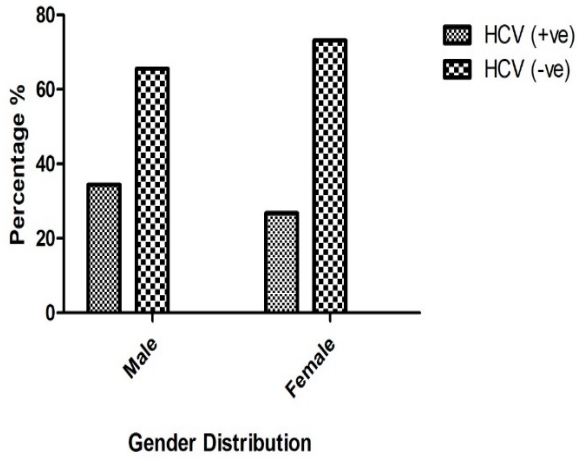


Fig.1: Gender wise distribution of HCV in Babozai

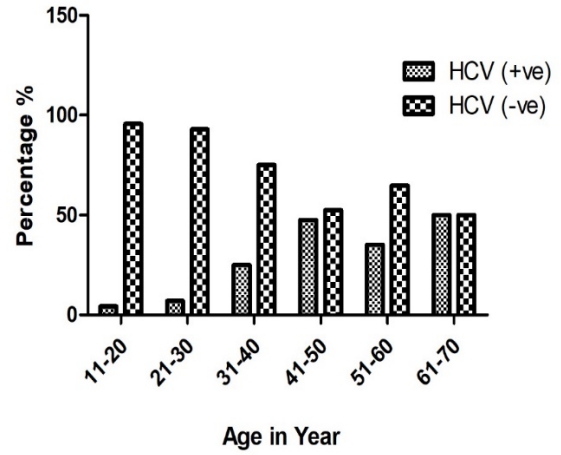


Fig.4: Age wise distribution of HCV in Kabal

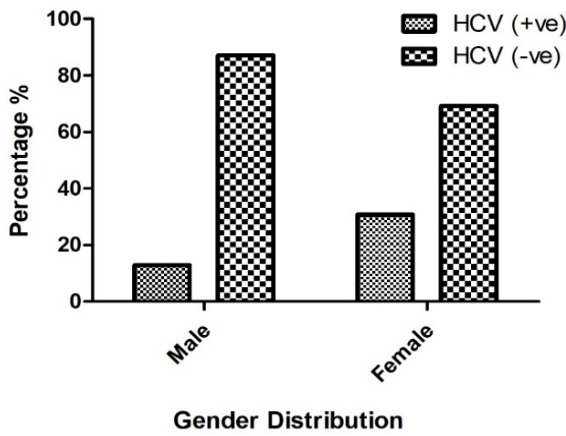


Fig.2: Gender wise distribution of HCV in Kabal

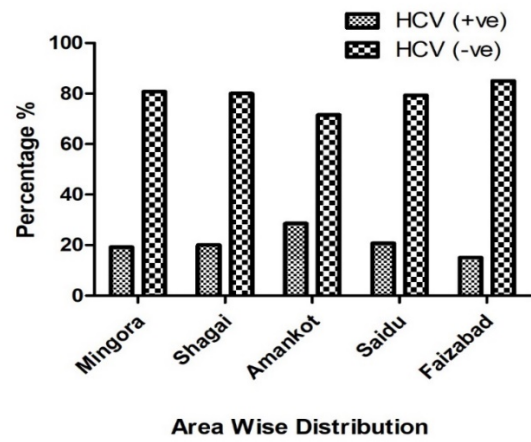


Fig.5: Area wise distribution of HCV in Babozai

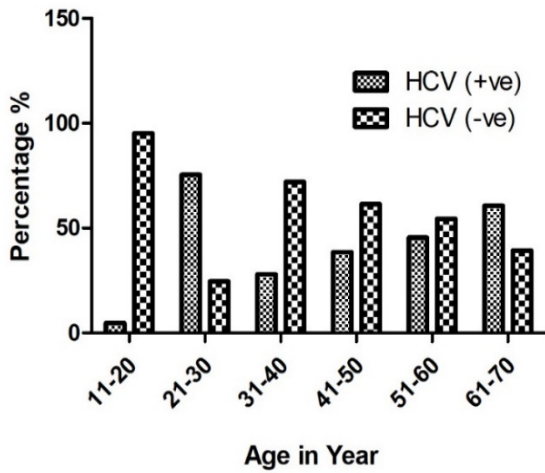


Fig.3: Age wise distribution of HCV in Babozai

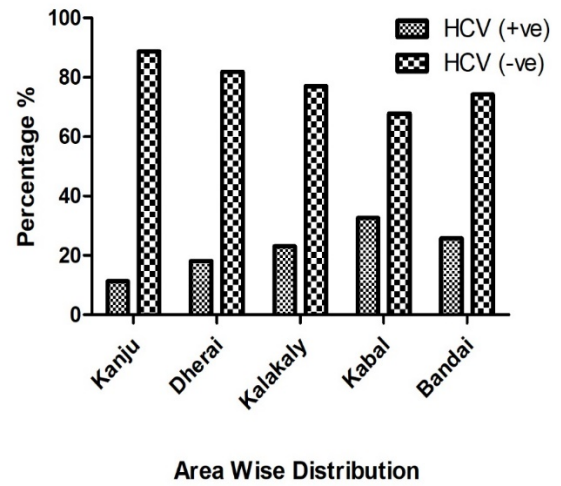


Fig.6: Area wise distribution of HCV in Kabal