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| Research Article              | Pak-Euro Journal of Medical and Life Sciences               |                         |
| DOI: 10.31580/pjmls.v6i2.2743 | Copyright © All rights are reserved by Corresponding Author |                         |
| Vol. 6 No. 2, 2023: pp. 55-62 |   |                         |
| www.readersinsight.net/pjmls  | Revised: May 29, 2023                                       | Accepted: June 14, 2023 |
| Submission: April 10, 2023    | Published Online: June 30, 2023                             |                         |

## PREVALENCE, RISK FACTORS, AND ASSOCIATED SUB-CLINICAL ASPECTS OF HEPATITIS A, B AND C IN ETHNIC GROUPS OF PANJGUR DISTRICT, BALOCHISTAN

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### Abstract

Hepatitis is a severe health matter and this study was designed at examining the occurrence of HAV, HBV and HCV specifically in major ethnic groups (Brahui, Baloch, Pashtun, punjabi Sindhi) living in District Panjgur with prior concentration given to the associated risk factors and sub-clinical features. During the study, the overall prevalence was high in males 32.77 % (370/1129) than females 27.63 % (312/1129). Out of total 1129 studied cases, 229 (20.28%) were found to be hepatitis A patients, 375 (33.21%) individuals were suffering from HBV and 78 (6.90%) were suffering from HCV infection. Group-I (1–20 years), Group-II (21–40 years), and Group-III (41–60 years) were used to categorize all the affected people. Infection rates were greatest in age group II (21–40 years). Similar to this, it was found that the majority of the patients had inadequate hygiene. The use of unsterilized medical and dental equipment, accidents, blood transfusions, and unsafe sexual contact were identified as the main risk factors for the spread of viral hepatitis. Fever, muscular pain, jaundice, dark urine and abdominal pain were the most commonly occurred sub-clinical features.

Keywords: Hepatitis, Hygiene Prevalence, Panjgur, Risk factors, Unsterilized medical equipment

## INTRODUCTION

Hepatitis being a substantial burning health issue globally, characterized by liver inflammation, caused by a viral infection, toxins, drugs, and autoimmune disorders. According to the report of World Health Organization (WHO), approximately 290 million people are infected with hepatitis, resulting in 1.3 million deaths per annum (1).

There are many types of hepatitis i. e: A, B, C, D, and E, but hepatitis A, B & C are the most common types existing in the society. Hepatitis ranked among the most public viral infections occurring worldwide and generating major health issues for international community (2, 3). Hepatitis A virus (HAV) spread through oral route (food and water), whereas, hepatitis B & C are spread through blood and other body fluids. Hepatitis B and C virus (HBV & HCV) are the most common forms of chronic viral hepatitis, which can lead to serious liver damage and escalate the chances of liver cancer (4, 5).

HBV has an annual infection rate of 400 million individuals, making it the main cause of death and illness (6-8). Hepatitis has a significant contribution in the development of liver cirrhosis and HCC (Hepatocellular Carcinoma) (4, 9, 10). Despite the fact that chronic hepatitis can develop everywhere in the world, it is endemic to Asia and Africa. In addition to these areas, HAV and HBV infections are quite common among a number of advanced state populations, including migrants and drug users (11, 12). Pakistan, a developing nation in Asia, has a very high rate of hepatitis infection throughout the whole nation, including its main cities such as Karachi (13, 14), Sukkur (15), Faisalabad (16-18), Rawalpindi (19, 20), Lahore (21, 22), and Quetta (23, 24) where hepatitis infection rates are rising quickly.

The common symptoms for hepatitis are nausea, vomiting, weight loss, pale stool, darkish urine, portal hypertension, generalized edema, ascites, splenomegaly, hepatocellular carcinoma, hepatic fibrosis, cirrhosis and may also leads to death (25-27).



This study sought to determine the prevalence of hepatitis A, B, and C in ethnic groups as well as study the risk factors and subclinical symptoms associated with these infections. We included all the major ethnic groups currently living in district Panjgur. It also sought to raise awareness of these issues among the people of district Panjgur so that they could take precautions to reduce their risk of infection in the future.

## MATERIALS AND METHODS

### STUDY DESIGN

A survey was conducted in DHQ, Panjgur during May 2022 to March 2023 in order to compile information on patients' ages between 1 and 60 for HAV, HBV, and HCV. From the patients' consultants, the full medical history was obtained. Participants older than 60 years and younger than 1 year were not allowed to participate in the study. Patients with renal, cardiac, metabolic, other hereditary conditions, as well as those with thyroid issues, were also eliminated.

This study was designed at examining the occurrence of HAV, HBV and HCV specifically in major ethnic groups (Brahui, Baloch, Pashtun, punjabi Sindhi) living in District Panjgur. The sociodemographic information, such as age, gender, marital status, history of vaccinations, level of education, employment, and history of blood transfusion, was taken from the patient records. In our questionnaire-based investigation, information on related risk factors was also gathered from the participants and their guardians. In total 1129 blood samples were collected for the screening of HAV, HBV, and HCV infection among which 584 were males and 545 were females. Patients were classified into 3 aged groups as: Group I: 1–20 years, Group II: 21–40 years and Group III: 41–60 years.

### LABORATORY EXAMINATION

Blood was drawn under sterile circumstances in order to test for HAV, HBV, and HCV infections using third-generation, commercially available ELISA kits to detect the reactivity of antibodies-antigen reactions. Data was entered on GraphPad Prism Version 6 (IBMP Crop, USA) for analysis and graph preparation. The data is presented in percentage.

## RESULTS

### PREVALENCE AND SOCIO-DEMOGRAPHIC FEATURES OF HEPATITIS

During the period of 11 months from May-2022 to March 2023, 1129 individuals were screened for HAV, HBV & HCV infection. Out of total 1129 studied cases, 682/1129 (60.40%) were infected with hepatitis and 447/1129 (39.59%) were normal individuals. Out of 60.40% positive individuals, 10.18% male and 10.09% female were found to be infected with HAV, 20.46% male and 12.75% female; 3.98% male and 2.92% females were suffering with HBV and HCV respectively (Fig. 1a). The prevalence of HAV was found to be high in group-II both in male (8.23%) and female (6.82%). Similarly HBV and HCV both showed high prevalence in group-II patients (Fig. 1b).

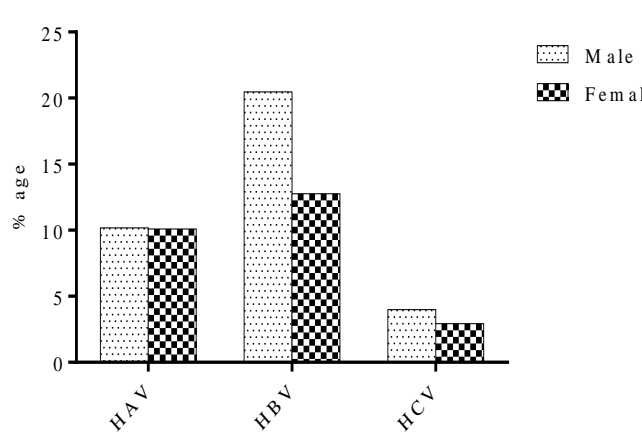


Fig. 1a. Overall prevalence of HAV, HBV and HCV infection in male and female patients of Panjgur District

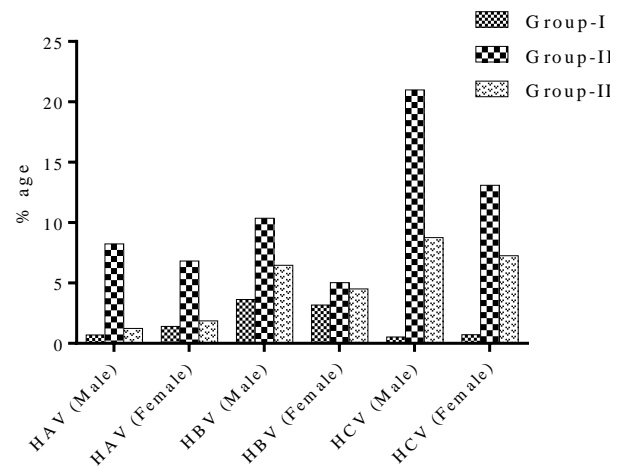


Fig. 1b. Age wise prevalence (%age) of Male and Female HAV, HBV and HCV patients of Panjgur District

Table I lists a number of sociodemographic factors connected to the frequency of HAV, HBV, and HCV infection. High prevalence was recorded in married individuals in all three types of hepatitis infection. The HBV and HCV infection was found to be strongly associated with vaccination and monthly income. The high prevalence of HBV (30.20%) and HCV (15.04%) infection was observed in unvaccinated patients and those with poor economic status (23.0% in case of HBV & 3.80% in case of HCV). We discovered a weak correlation between HBV prevalence and employment and education.

**Table I.** Socio-demographic factors associated with the prevalence of HAV, HBV & HCV infections in patients of Panjgur District (N=682)

| S/No | Characters     | Groups           | HAV             | HBV             | HCV             | Total           |
|------|----------------|------------------|-----------------|-----------------|-----------------|-----------------|
| 1    | Marital status | Married          | 132<br>(11.69%) | 239<br>(21.16%) | 50<br>(4.42%)   | 421<br>(37.28%) |
|      |                | Un-married       | 97<br>(8.59%)   | 136<br>(12.04%) | 28<br>(2.48%)   | 261<br>(23.11%) |
| 2    | Vaccination    | Un-vaccinated    | -               | 341<br>(30.20%) | 170<br>(15.04%) | 511<br>(45.26%) |
|      |                | Complete         | -               | 29<br>(2.56%)   | 12<br>(1.06%)   | 41<br>(3.63%)   |
|      |                | Partial          | -               | 67<br>(5.93%)   | 63<br>(5.58%)   | 130<br>(11.51%) |
|      |                | Primary          | 07<br>(0.62%)   | 06<br>(0.53%)   | 07<br>(0.62%)   | 20<br>(1.77%)   |
|      |                | Middle           | 12<br>(1.06%)   | 30<br>(2.65%)   | 17<br>(1.50%)   | 59<br>(5.22%)   |
|      |                | Matric           | 15<br>(1.32%)   | 40<br>(3.54%)   | 09<br>(0.79%)   | 64<br>(5.66%)   |
|      |                | Intermediate     | 40<br>(3.54%)   | 110<br>(9.74%)  | 39<br>(3.45%)   | 189<br>(16.74%) |
| 3    | Education      | Bachelor         | 05<br>(0.44%)   | 21<br>(1.86%)   | 08<br>(0.70%)   | 34<br>(3.01%)   |
|      |                | Masters          | 10<br>(0.88%)   | 9<br>(0.79%)    | 09<br>(0.79%)   | 28<br>(2.48%)   |
|      |                | Higher education | 22<br>(1.94%)   | 55<br>(4.87%)   | 38<br>(3.36%)   | 115<br>(10.18%) |
|      |                | Illiterate       | 46<br>(4.07%)   | 57<br>(5.04%)   | 70<br>(6.20%)   | 173<br>(15.32%) |
|      |                | Poor             | -               | 260<br>(23.0%)  | 43<br>(3.80%)   | 396<br>(35.07%) |
| 4    | Income         | Middle           | 81<br>(7.17%)   | 122<br>(10.80%) | 25<br>(2.21%)   | 228<br>(20.19%) |
|      |                | Elite            | 14<br>(1.24%)   | 37<br>(3.27%)   | 07<br>(0.62%)   | 58<br>(5.13%)   |
|      |                | Employed         | 11<br>(0.97%)   | 30<br>(2.65%)   | 12<br>(1.06%)   | 53<br>(4.69%)   |
| 5    | Occupation     | Unemployed       | 102<br>(9.03%)  | 258<br>(22.85%) | 31<br>(2.74%)   | 391<br>(34.63%) |
|      |                | Business         | 76<br>(6.73%)   | 133<br>(11.78%) | 29<br>(2.56%)   | 238<br>(21.08%) |

### ETHNIC BASED PREVALENCE OF HAV, HBV & HCV

As far as ethnic grouping is concern the highest prevalence of HCV (15.67%), HBV (9.12%) was found in the Baloch community and HCV (6.28%) in Brahui community of District Panjgur (Fig. 2). Out of 447 non infected patients 4.60% (52/1129) were Pashtun, 8.76% (99/1129) were Brahui, 22.14% (250/1129) were Baloch, and 4.07 (46/1129) were Punjabi.

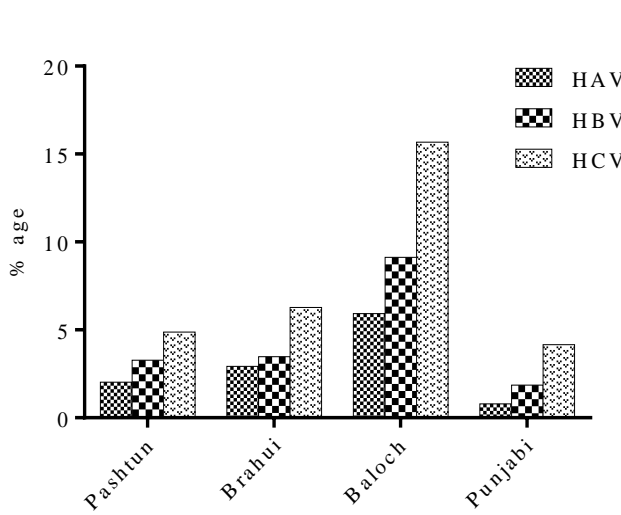


Fig. 2. Prevalence of HAV, HBV, & HCV in various ethnic groups of Panjgur District

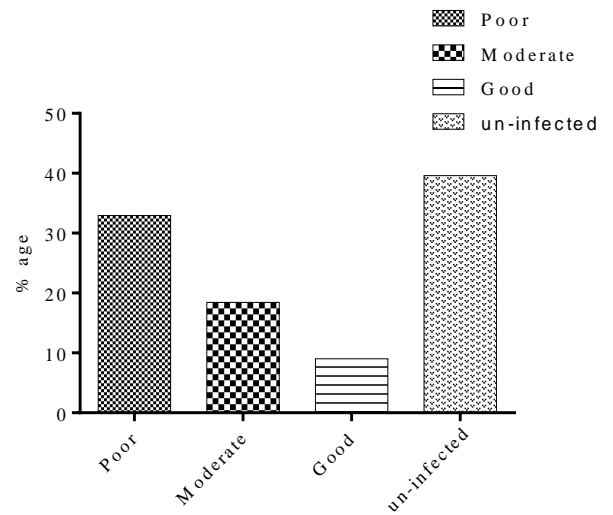


Fig. 3. Hygiene condition of the HAV, HBV and HCV patients of Panjgur District

### HYGIENE CONDITION OF HAV, HBV AND HCV PATIENTS

Most of the HAV and HBV patients 372/1129 (32.94%) were found to have poor hygiene condition, followed by moderate (18.42%) and good (9.03%). However 39.59% individuals were not infected with any of the hepatitis infection (Fig. 3)

### RISK FACTORS ASSOCIATED WITH HAV, HBV AND HCV

The research showed that the main risk factors for HAV infection were contaminated food & water (34.98%), followed by blood transfusion (22.76%) and dental tools (13.55%); for HBV the major risk factors were blood transfusion (27.36%), surgical (19.66%), and dental tools (19.30%). Similarly for HCV blood transfusion (5.58%), followed by dental (3.72%) and surgical tools (3.54%) (Fig. 4).

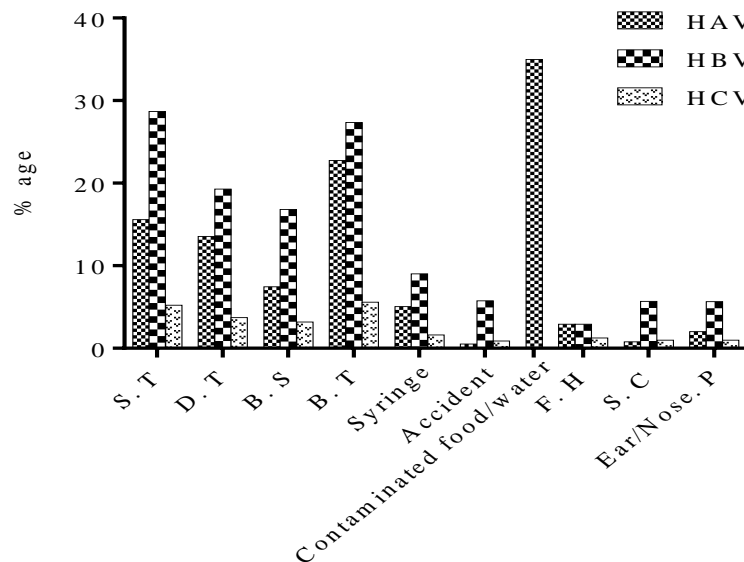


Fig. 4. Risk factors associated with HAV, HBV, & HCV in the patients of district Panjgur. [Abbreviations: S. T (Surgical tools); D. T (Dental Tools); B. S (Barber Shop); B. T (Blood Transfusion); F. H (Family History); S. C (Sexual Contact); Ear/Nose. P (Piercing)]

### SUBCLINICAL FEATURES ASSOCIATED WITH HAV, HBV AND HCV INFECTION

We discovered some negative impacts on the health of HAV, HBV, and HCV patients based on the questionnaire survey. Patients' most frequent subclinical symptoms included fever, muscle pain, fatigue, Dark urine, Jaundice, and abdominal pain (Table II).

**Table II.** Sub-clinical features associated with the prevalence of HAV, HBV & HCV infections in patients of Panjgur District

| S. No | Subclinical features | HAV (%)         | HBV (%)         | HCV (%)       |
|-------|----------------------|-----------------|-----------------|---------------|
| 1     | Fever                | 202<br>(17.89)  | 329<br>(29.14)  | 71<br>(6.28)  |
| 2     | Muscle pain          | 26<br>(2.30)    | 317<br>(28.07)  | 53<br>(4.69)  |
| 3     | Fatigue              | 57<br>(5.04)    | 263<br>(23.29)  | 39<br>(3.45)  |
| 4     | Vomiting             | 12<br>(1.06)    | 210<br>(18.60)  | 34<br>(3.01)  |
| 5     | Headache             | 28<br>(2.48)    | 313<br>(27.72)  | 46<br>(4.07)  |
| 6     | Weight loss          | 20<br>(1.77)    | 148<br>(13.10)  | 13<br>(2.03)  |
| 7     | Loss of appetite     | 48<br>(4.25)    | 94<br>(8.32)    | 13<br>(2.03)  |
| 8     | Constipation         | 19<br>(1.68)    | 50<br>(4.42)    | 07<br>(0.62)  |
| 9     | Dark urine           | 123<br>(10.89%) | 324<br>(28.69%) | 66<br>(5.84%) |
| 10    | Jaundice             | 74<br>(6.55)    | 332<br>(29.40)  | 68<br>(6.02)  |
| 11    | Nausea               | 70<br>(6.20)    | 218<br>(19.30)  | 43<br>(3.80)  |
| 12    | Abdominal pain       | 109<br>(9.65)   | 276<br>(24.44)  | 54<br>(4.78)  |
| 13    | Joint pain           | 22<br>(1.94)    | 202<br>(17.89)  | 42<br>(3.72)  |

## DISCUSSION

The overall prevalence of HAV, HBV and HCV was found to be high in the local population of Panjgur, however the numbers of HBV positive cases were found to be very high as compared to HAV and HCV. Our results are in agreement with the previous study (22, 28, 29). The high prevalence of HBV might be attributed to improper blood screening for transfusion, re-use of contaminated syringes, limited health facilities, and delay improper way of vaccination as Panjgur is a very backward area and health facilities are very limited. Gender-based prevalence revealed that there were more male infections of HAV, HBV, and HCV than female cases, which might be due to the fact that male visited hospital more frequently than females. Previous studies also showed the same results from various parts of the country (30-32). The study examined the higher frequency of HAV, HBV, and HCV in six main ethnic groups, among these ethnic groups and results revealed that high prevalence was found in Baloch community as compared to other infected factions of Panjgur. The larger number of Baloch people in the study region may be a contributing factor. Other investigation also exposed parallel results (33, 34).

Previously, many other researchers also concluded in their studies that the individuals aged between 21 and 40 years are more exposed to the infection of hepatitis (35), the present data also showed the same results. Furthermore, the present data showed that hygiene condition is directly proportional to the prevalence of hepatitis as 32.94% infected individuals having poor hygiene condition (36). The findings revealed that high prevalence of hepatitis infection in married couples which might be due to transmission of HBV and HCV from their life partners due to sexual contact since there is no trend to do pre-marriage diagnostic tests in Pakistan, the findings are in agreement with other (23, 24).

Additionally, we concentrated on a few risk factors for the transmission of hepatitis. The transmission of the hepatic virus, particularly HBV, is greatly influenced by a number of risk factors,



including the use of improperly sterilized dental instruments, unscreened blood transfusions, syringe reuse, and—most importantly—participation in unsafe sexual interactions. Other researchers have examined these risk factors globally (37, 38). Contaminated water and poorly cooked or contaminated food are also important risk factors of hepatitis prevalence but purely for HAV infection. Ear and nose piercing was also a major reason for hepatic viral transmission among the females.

Certain subclinical features were also studied in the questionnaire based study and we found fever, muscular pain, jaundice, Vomiting, Dark urine, Headache, abdominal pain were the most commonly found subclinical features. Previously, other workers also reported the same subclinical features (39, 40).

## CONCLUSION

Several ethnic groups from Panjgur have relatively high HAV, HBV and HCV prevalence rates but the incidence was high in Baloch community due to the fact that Baloch community is the most dominant population of the area. They become infected with one of the illnesses as a result of several reckless actions. Vaccinations and other preventative interventions are only used by a very small percentage of people. As a result, Panjgur is anticipated to experience an increase in illnesses in the next years. However, there are some limitations of the study, like the sample size is small because majority patients prefer to visit the big cities for the treatment and we collected the data from district civil hospital, Panjgur.

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