

Research Article**Seroprevalence of Hepatitis B & C and Pattern of Liver Function Tests in Hepatitis Positive Patients in Abbottabad****Muhammad Usman Anjum^{1*}, Fahad Khan², Nazish Ali³, Sanam Khan⁴, Syed Humayun Shah⁵**¹Assistant Professor, Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan²Lecturer, Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan³Medical Officer, Qamar-ul-Islam Hospital, Karachi, Pakistan⁴Lecturer, Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan⁵Professor, Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan***Corresponding author**

Dr. Muhammad Usman Anjum

Email: usmanziyai@gmail.com

Abstract: This study is conducted to determine the prevalence of hepatitis B and hepatitis C virus infection in Abbottabad and to see the pattern of liver function tests in hepatitis positive patients. It was conducted at Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan, from June 2014 to December 2014. All the patients referred for hepatitis screening were included in the study based on inclusion and exclusion criteria. Liver function tests were performed using automatic chemistry analyzer while hepatitis B surface antigen and anti-HCV antibodies were checked using rapid diagnostic kits. 105 patients were included in the study with male to female ratio of 1.18:1. Out of 105 cases, there were 15 (14.28%) patients who were positive for hepatitis and all 15 were positive for anti-HCV antibodies with 6 (40%) males and 9 (60%) females, showing high predilection for female gender. Majority of patients, about 57 (54.12%), were in the age range of 21-40 years, followed by 19 (18.09%) patients in the age group of 40-50 years. The mean age of hepatitis positive patients was 33.33 ± 13.37 years. Regarding liver function tests, the alanine transaminase levels (ALT) were 77.9 and 132 U/L in hepatitis negative and hepatitis positive patients respectively. Enzyme levels were 1.65 times higher in hepatitis positive patients than hepatitis negative patients. Rest of the parameters were within normal limits. Hepatitis B and C are common cause of liver dysfunction in our country. Hepatitis C infection is more prevalent than Hepatitis B. Hepatitis infection can lead to raised ALT levels even when other parameters of liver function tests are within normal limits. Therefore, all patients who have raised ALT levels must undergo hepatitis screening.

Keywords: Hepatitis B, Hepatitis C, Liver function tests, Seroprevalence.

INTRODUCTION

Liver diseases constitute a significant health burden. They range from infectious diseases to metabolic ones. Viral infections are responsible for a significant numbers of liver diseases. Most common of these are hepatitis B & C virus infections [1]. Hepatitis B virus (HBV) is a DNA virus which affects about 300 to 400 million people and is responsible for one million deaths per year worldwide [2]. There are 50 million new cases of HBV each year [3]. Hepatitis C virus (HCV) is a RNA virus which is affecting more than 170 million people worldwide [1]. It is one of the important causes of liver transplantation [4]. It comprises of six different genotypes, of which genotype 3a is most common in Pakistan [5, 6].

Both of these infections are associated with increased incidence of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma [1, 4]. There are many

factors associated with acquisition of HBV and HCV infections. Most common risk factors are using unsterilized or improperly sterilized instruments for medical treatment and body piercing or tattooing, sharing needles among drug abusers and blood transfusion [2, 4].

Liver function tests (LFTs) reflect various functions of the liver. They usually include bilirubin, alanine transaminase (ALT), alkaline phosphatase and gamma glutamyl transferase (GGT) [7]. LFTs are usually performed for screening purposes or in patients with non-specific symptoms [8]. Any abnormality in LFTs gives us an idea about the functioning of liver. Enzymes are usually raised in hepatic abnormality with ALT being more specific to liver [7]. Therefore, LFTs give an important indication of liver abnormality which can later be followed to find the underlying cause or pathology of liver.

The aim of our study was to determine the seroprevalence of HBV & HCV in Abbottabad and to see the pattern of liver function tests (LFTs) in hepatitis positive patients.

MATERIALS AND METHODS

It was a descriptive study which was conducted from June 2014 to December 2014 at Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan. There was consecutive non-probability sampling.

After approval from Hospital Ethics Committee, all normal healthy individuals who presented for hepatitis screening were included in this study. Patients suffering from chronic liver disease, receiving hepato-toxic drugs, less than 10 and more than 80 years of age, or suffering from any metabolic liver disease were excluded from the study.

Liver function tests (LFTs) were checked for all patients included in study. LFTs included bilirubin, alanine transaminase (ALT), alkaline phosphatase and gamma glutamyl transferase (GGT). LFTs were performed using automatic blood chemistry analyzer (Hitachi 902, Roche Diagnostics, Germany). Five ml of blood was taken under strict aseptic conditions. Hepatitis B surface antigen (HbsAg) and anti-HCV antibodies were checked using rapid diagnostic kits (Standard Diagnostics Inc. Korea). For hepatitis B, about 100µL was placed on test chamber using micro-pipette. Result was recorded after twenty minutes. Presence of two bands meant positive result. Presence of only one band signified negative result. For hepatitis C, about 10µL was placed on test chamber using micro-pipette. Four drops of assay diluent were placed in the designated chamber by keeping the diluents bottle at 90°. Result was recorded after five to twenty minutes. Presence of two bands meant positive result. These were disposable kits, therefore each kit was used only once and discarded properly after use. All positive cases were confirmed using ELISA (enzyme linked immunosorbent assay).

The data was organized and analyzed using Statistical Package for the Social Sciences (SPSS, version 17). Frequencies and percentages were calculated for all categorical data like gender, hepatitis positive and negative cases, and continuous data like age, liver function tests were presented by Mean ± SD.

RESULTS

There were total 123 patients in this study. There were 57 (54.29%) males and 48 (45.71%) females, with a male to female ratio of 1.18:1 as shown in Fig. 1. Eighteen patients were excluded from the study based on exclusion criteria.

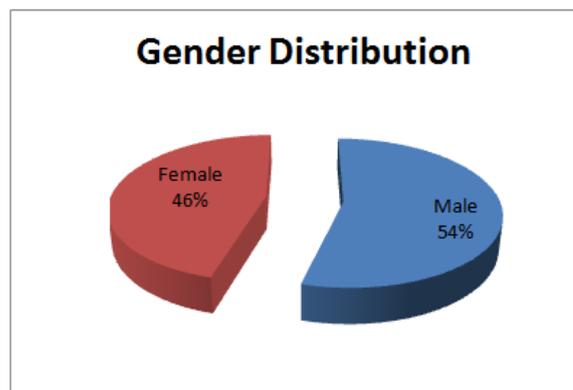


Fig. 1: Gender distribution of study sample

The mean age of hepatitis negative patients was 34.58 ± 14.57 years while 33.33±13.37 years for hepatitis positive patients in our study. Majority of patients, about 57 (54.12%) were in the age range of 21-40 years, followed by 19 (18.09%) patients in the age group of 40-50 years, 18 patients (17.14%) in the age range of 10-22 years and 11 (10.47%) patients were in the age range of 50+ years, as shown in Table 1.

Table 1: Age-wise distribution of study sample (n=105)

Age ranges (in years)	No. of cases	Percentage
10-20	18	17.14%
21-30	31	29.52%
31-40	26	24.76%
40-50	19	18.09%
50+	11	10.47%
Total	105	100%

Out of 105 cases, there were 15 (14.28%) patients who were positive hepatitis and all 15 cases were positive for anti-HCV antibodies and there was not a case which was positive for HbsAg, as shown in Table 2 & 3. Hepatitis positive patients consisted of 6 (40%) males and 9 (60%) females, showing high predilection for female gender. While stratifying the HCV positive patients according to gender, out of 57 males, 6 (5.71%) were positive for HCV while out of 48 females, 9 (8.57%) were positive for HCV as shown in Table 4.

Table 2: Hepatitis positive patients (n=15)

Test	No. of Patients	Percentage
Hepatitis Positive	15	14.28%
Hepatitis Negative	90	85.72%
Total	105	100%

Table 3: Type of hepatitis positive patients (n=15)

Test	Positive	Negative	Total
Hepatitis C Positive	15	90	105
Hepatitis B Positive	00	105	105

Table no. 4, Gender wise stratification of hepatitis positive patients, (n=15)

Gender	No. of Patients	Hepatitis Positive	Percentage
Male	57	6	5.71%
Female	48	9	8.57%
Total	105	15	14.28%

The values of LFTs in hepatitis positive and negative patients were given in Table no 5. The table represents the mean value of the given test and standard deviation, in both hepatitis positive and negative patients.

Table 5: Liver function tests in hepatitis positive and hepatitis negative patients

LFT Marker	Hepatitis Negative Patients	Hepatitis Positive Patients	Normal value
Bilirubin	0.81±0.89	0.78±0.82	0.1-1.2 mg/dl
Alanine Transaminase	77.9±156.29	132±230.19	≤41 U/L
Alkaline Phosphatase	130.01±76.13	148.87±82.30	Male: 40-129 U/L Female: 35-104 U/L
Gamma Glutamyl Transferase	39.45±40.76	43.47±26.92	Male: 08-61U/L Female: 05-36 U/L

DISCUSSION

Liver dysfunction is associated with many diseases. Viral infections of the liver, caused by hepatitis viruses mostly HBV & HCV, accounts for significant amount of liver diseases especially in South Asia [9].

Our study has shown that the seropositivity for hepatitis was 14.28%. This is comparable to other studies already done on the same subject. Naeem *et al.* has shown that the prevalence of hepatitis was 12.99%, in their study done in Karachi, Pakistan [10]. Lehman and Wilson in their study conducted in Egypt have shown that the prevalence of HCV in healthy individuals is about 13.9% [11]. This is same as we have reported in our study as all the hepatitis positive cases comprised of HCV. Similarly, Tesfa *et al.*, in their study in Ethiopia, have shown that the prevalence of HCV was 12.4% [12]. There was no positive case for HBV in our study. This could be due to the fact that the we might needed a much larger study sample as well as the prevalence of HBV was documented to be quite low as compare to HCV. A study from Nepal conducted by Shrestha *et al.* has shown that the rate of prevalence of HBV was 0.47% [13]. Similarly, a study conducted in Pakistan by Ahmad *et al.*, the incidence of HCV positive cases was 13.8% while that of HBV was 3.5% [14].

Regarding gender of hepatitis positive patients, our study has shown that there were 6 (40%) males and 9 (60%) females, showing predominance of female gender. This is quite in contrast to other studies. Khattak *et al.*[1], Shrestha *et al.* [10] and Naeem *et al.* [13] have shown male predominance in their studies. This may be due to better availability and better access to modern health care facilities. The mean age of hepatitis positive patients was 33.33±13.37 years in our study. This finding was same as reported by Khattak *et al.* [1] in their study which was conducted in Pakistan. The mean age of HCV positive patients in their study was 35.58±13.93 years.

There were many studies done about the prevalence of hepatitis B & C and associated risk factors in general and specific population groups. We have also performed liver function tests in all the patients in our study to determine the level of various markers of liver function in hepatitis positive and negative cases and to see their correlation. The bilirubin levels in hepatitis negative and positive patients were comparable. It is also documented in literature that high levels of bilirubin, especially conjugated one, are usually seen in chronic hepatitis B & C [7]. ALT is liver specific enzyme. In our study, ALT levels were 77.9 and 132 U/L in hepatitis negative and positive patients respectively. It is evident that these levels are considerably higher (about 1.65 times) in hepatitis positive patients than in hepatitis negative patients. Therefore, all patients with raised ALT must be screened for presence of HBV & HCV infection. The raised levels of ALT in hepatitis negative patients signifies that they may be raised due to other diseases affecting the liver, as we have only screened these patients for HBV and HCV [7]. While the GGT levels were within normal limits for both groups.

CONCLUSION

HBV & HCV infections are common causes of liver dysfunction in our country. HCV infection is more prevalent than HBV. Hepatitis infection can lead to raised ALT levels even when other parameters of liver function tests are within normal limits. Therefore, all patients who have raised ALT levels must undergo hepatitis screening.

REFERENCES

1. Khattak A, Nawaz H, Khan J, Khan H; Frequency of hepatitis B and C on screening in Dera Ismail Khan. Gomal Journal of Medical Sciences, 2012; 10(1): 84-86.
2. Dienstag JL; Hepatitis B virus infection. New England Journal of Medicine, 2008; 359(14): 1486-1500.

3. Perrillo R; Hepatitis B virus replication x time equals trouble. *Gastroenterology*, 2006; 130(3): 989-991.
4. Rosen HR; Chronic hepatitis C infection. *New England Journal of Medicine*, 2011; 364(25): 2429-2438.
5. Khan TM, Mehr MT, Ullah H, Khan H, Iman N; Frequency of hepatitis C virus genotypes in the North of Pakistan. *Gomal Journal of Medical Sciences*, 2014; 12(2): 106-109.
6. Idrees M, Riazuddin S; Frequency distribution of hepatitis C virus genotypes in different geographical regions of Pakistan and their possible routes of transmission. *BMC Infectious Diseases*, 2008; 8: 69-77.
7. Limdi JK, Hyde GM; Evaluation of abnormal liver function tests. *Postgraduate Medical Journal*, 2003; 79(932): 307-312.
8. Radcke S, Dillon JF, Murray AL; A systematic review of the prevalence of mildly abnormal liver function tests and associated health outcomes. *European Journal of Gastroenterology & Hepatology*, 2015; 27(1): 1-7.
9. Liu Z, Hou J; Hepatitis B virus (HBV) and hepatitis C virus (HCV) dual infection. *International Journal of Medical Sciences*, 2006; 3(2): 57-62.
10. Naeem SS, Siddiqui EU, Kazi AN, Khan S, Abdullah FE, Adhi I; Prevalence of hepatitis 'B' and hepatitis 'C' among preoperative cataract patients in Karachi. *BMC Research Notes*, 2012; 5: 492-495.
11. Lehman EM, Wilson ML; Epidemiology of hepatitis viruses among hepatocellular carcinoma cases and healthy people in Egypt: a systematic review and meta-analysis. *International Journal of Cancer*, 2009; 124(3): 690-697.
12. Tesfa H, Biadgo B, Getachew F, Tegegne K, Yismaw G, Muluye D; Seroprevalence of hepatitis B and C virus infection among patients attending serology laboratory of Gondar University Hospital. *BMC Research Notes*, 2013; 6: 164-167.
13. Shrestha AC, Ghimire P, Tiwari BR, Rajkarnikar M; Transfusion-transmissible infections among blood donors in Kathmandu, Nepal. *Journal of Infection in Developing Countries*, 2009; 3(10): 794-797.
14. Ahmad A, Ahmad B, Ali A, Ahmad Y; Seroprevalence of HBsAg and anti-HCV in general healthy population of Swat district with frequency of different HCV genotypes. *Pakistan Journal of Medical Sciences*, 2009; 25(5): 744-748.