

Frequency of hepatitis C virus infection in Type 2 Diabetic patients

NIAZ ALI¹, SABA IQBAL², FOUZIA BASHIR³, SHAMA TANVEER⁴, MUHAMMAD IBRAHIM KHAN⁵, SHAHZAD AHMAD⁶

¹MBBS, FCPS (Medicine) Senior Registrar, Qazi Hussain Ahmad Complex, Nowshera

²Registered Nurse, Punjab Institute of Mental Health, Lahore

³University of Lahore Teaching Hospital, Lahore

⁴Registered Nurse, Punjab Institute of Mental Health Lahore

⁵Senior Registrar Medicine, Pakistan International Medical College

⁶Assistant professor of Medicine, Northwest General Hospital

Corresponding author: Muhammad Ibrahim Khan, Email: Dr.ibrahim2011ala1@gmail.com

ABSTRACT

Background: Infection caused by hepatitis C virus is common and important issue of public health in Pakistan.

The risk factors associated with type 2 diabetes mellitus and hepatitis C virus has common association.

Objectives: To find out the frequency of hepatitis C virus in Type 2 Diabetes mellitus patients and to assess the association between Type 2 Diabetes mellitus and hepatitis C virus.

Methodology: This was descriptive study piloted at the Department of Medicine Hayatabad Medical Complex Peshawar for duration of one year. Totally, 157 type 2 diabetic patients were included. All information's were documented on a prescribed Performa.

Results: Out of 157 confirmed diabetic patients, 50 (31.85%) were seropositive for anti HCV antibodies while 107(68.15%) were negative. There were 48% males and 52% female in the entire study. Patient's age ranged from 31 to 73years. The seroprevalence of HCV in female was 29(58%) while in male it was 21(42%).

Conclusion: Our study concludes that HCV infection is highly prevalent in patients with Type 2 Diabetes mellitus.

Keywords: Chronic Hepatitis C, Hepatocellular Carcinoma, Diabetes mellitus.

INTRODUCTION

Hepatitis C virus infection is a serious public health concern that affects over 170 million people globally, with chronic infection ranging from 55 to 80 %¹. HCV infection has already become the commonest cause of chronic liver disease and hepatocellular carcinoma and the single most common reason for liver transplantation the world over ².

Currently, in general population, the HCV infection prevalence is approximately 8 to 10% while the prevalence of diabetes is 12% in people having age above 25 years. In Pakistan, the risk factors associated with type 2 diabetes mellitus and hepatitis C virus has common association. ³. Most infected people have a silent onset of HCV infection, and current research suggests that the likelihood of progression to severe liver disease may be lower than previously thought ⁴. During the next 10 to 20 years, the disease burden related with HCV infection is projected to rise ⁵.

On the other hand Diabetes mellitus is a syndrome characterized by chronic hyperglycemia and a relative or absolute insulin deficiency. It affects more than 194 million (5.1%) people worldwide among the world total population of 6.3 billion. This figure is estimated to reach 333 million by year 2025. Additionally currently 314 million people are having IGT which will reach up to 472 million by year 2025 ⁶. The type 2 diabetes mellitus in the developed countries ranges from 2-9.4% ⁷. In adult's population of Pakistan, the prevalence of diabetes has arisen to 12% ⁸. As a result, the prevalence of both HCV liver disease and diabetes is expected to rise over the next decades ⁹.

Multiple researchers observed high HCV prevalence in Type 2 Diabetes mellitus patients than control group. They reported 2-7 times higher prevalence of HCV in patients with Type 2 Diabetes mellitus than control group ¹⁰⁻¹³. Another study reported that the risk of Type 2 Diabetes mellitus increases with the infection caused by HCV ¹⁴. Numerous cross-sectional studies reported high HCV

prevalence in patients with Type 2 Diabetes mellitus as compared to general population ^{15, 16}. According to the literature, various studies reported the association between HCV and Type 2 Diabetes mellitus. To find out the prevalence of hepatitis C virus in Type 2 Diabetes mellitus patients and to assess the association between Type 2 Diabetes mellitus and hepatitis C virus.

MATERIAL & METHODS

This descriptive study was done in medical unit Postgraduate Medical Institute, Hayatabad Medical Complex Peshawar. The duration of this study was one year in which 157 confirmed type 2 diabetics were tested for the evidence of hepatitis C infection. The inclusion criteria for our study were all the patients of both the gender with type 2 diabetes mellitus while the exclusion criteria was a type 1 diabetes mellitus patient, patients with causes of secondary diabetes mellitus like pancreatic diseases, endocrine diseases, corticosteroid therapy, diabetic patients treated for HCV and patients with known probable HCV contact source like blood transfusion, surgery, hospitalization, dental procedures, and intravenous drug use. Approval of the ethical committee was given by the hospital. Written informed consent was taken from the patients admitted in medical unit. A detailed history was recorded for personal particulars, duration of illness, duration of diabetes mellitus, and previous hospitalization for surgery, blood transfusion, past history of injectable drug use, therapeutic injections and intravenous drips, needle stick injuries, dental procedures, tattooing, was specifically asked to identify the possible causes of HCV acquisition. All patients underwent complete physical examination, height and weight was recorded and Body mass index (BMI) was calculated. Following investigation was carried out; venous blood was sampled and sent to the hospital laboratory for anti HCV antibodies. After receiving blood test reports from laboratory, results were noted and

thus frequency of patient's positive for anti HCV antibodies was calculated among the 157 included type 2 diabetic patients. Patients who were anti HCV antibodies positive, were explained about his or her treatment, benefits in the risk of hepatitis C infection. Patients negative for anti HCV antibodies were educated about the risks of this disease and was advised the preventive measures of the disease. SPSS version 23 was used for analysis of data. Mean and standard deviation were documented for quantitative data while for quantitative data frequency and percentages were documented.

RESULTS

A total of 157 Type 2 Diabetes mellitus patient's were incorporated in the study. There were 75(48%) males and 82(52%) females. (Figure 1) The mean (SD) age of the included patients was 48.82±10.14 years. Minimum age was 31years and Maximum age was 73years. Age wise distribution of the patients is given in figure 2. Out of 157 confirmed diabetic patients, 50 of them (31.85%) were seropositive for anti HCV antibodies while 107(68.15%) were negative. (Figure 3) The seroprevalence of HCV in female was 29(58%) while in male it was 21(42%). (Figure 4)

In comparison to younger age groups more patients were observed with HCV in old age groups. Among the seropositive, 17(10.82%) were in the age group of 41 to 50 years (Table 1) Out of 50 HCV patients, 23(46%) has body mass index less than 25 followed by 21(42%) in the range of 26-30. (Table 2) The ALT level was also analyzed and 16(32%) patients were having normal range, 21(42%) were in the range of 41-100 and only 13 (26%) patients having ALT level above 100 (Table 3).

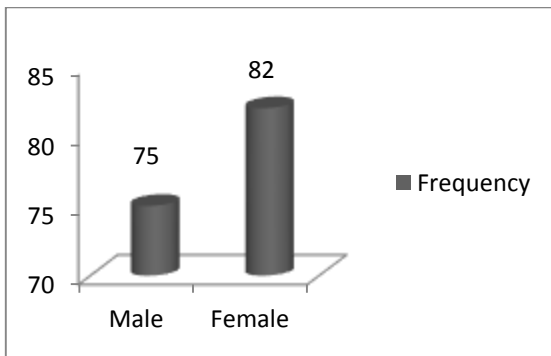


Figure 1: Gender wise distribution of patients

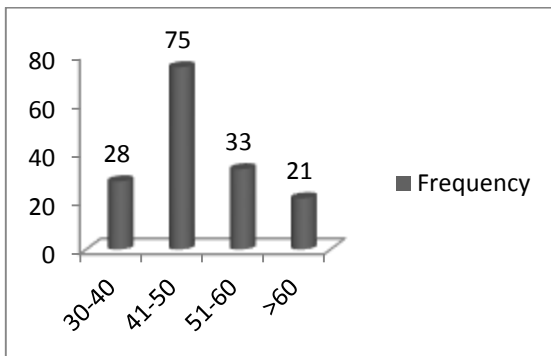


Figure 2: Age wise distribution of patients

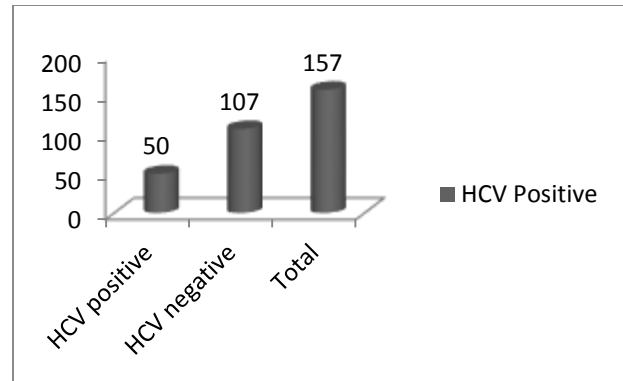


Figure 3: Overall frequency of HCV in Type 2 Diabetes mellitus patients

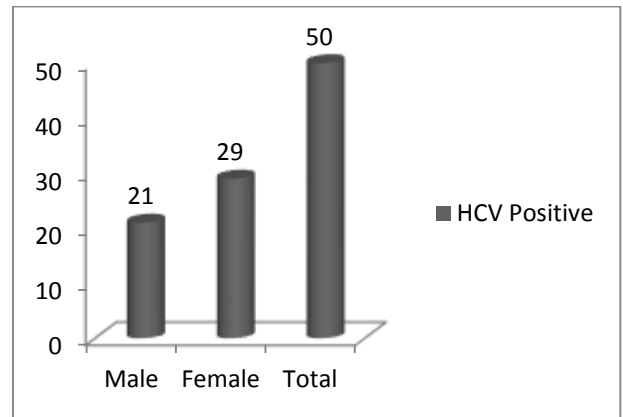


Figure 4: Gender wise frequency of HCV in Type 2 Diabetes mellitus patients

Table1: Age wise frequency of HCV in Type 2 Diabetes mellitus patients

Age (years)	HCV positive No (%)	HCV negative No (%)	Total No (%)
30-40	08 (5.09)	13 (8.28)	21 (13.37)
41-50	17 (10.82)	58 (36.95)	75 (47.77)
51-60	15 (9.55)	18 (11.46)	33 (21.01)
>60	10 (6.36)	18 (11.46)	28 (17.83)

Table 2: Body mass index of HCV positive patients

Body mass index	No of HCV patients	Percentage
< 25	23	46
26-30	21	42
31-35	04	8
36-40	02	4
Total	50	100

Table 3: Serum ALT levels of HCV positive patients

Alanine Aminotransferase	No of patients	Percentage
Normal 5-40 IU/L	16	32
41-100 IU/L	21	42
>100 IU/L	13	26
Total	50	100

DISCUSSION

Our study findings shows that out of 157 confirmed diabetic patients, 50(31.85%) were seropositive for anti HCV antibodies while 107(68.15%) were negative. These findings are consistent with the previous study who

reported 27.6% HCV prevalence in Type 2 Diabetes mellitus patients¹⁷. Another study also reported comparable results¹⁸. Another study done by Ali et al. reported that HCV is common among diabetic patients¹⁹. Moreover, a study done by Knobler and Schattner reported significant association between infection caused by HCV and Type 2 Diabetes mellitus patients²⁰.

The seroprevalence of HCV in female was 29(58%) while in male it was 21(42%). A previous study, done by Cacoub et al. also reported high prevalence of HCV in female²¹. Other studies reported contrasting results and reported that there was no gender difference^{19, 22}.

Due to the fact that age is a significant risk factor for diabetes mellitus, we examined the association between HCV infection and diabetes mellitus by using age stratification. In comparison to younger age groups more patients were observed with HCV in old age groups. Among the seropositive patients, 17(10.82%) were in the age group of 41 to 50 years. A previous study also supported these findings¹⁸. Another study done by Mehta et al. reported that type 2 diabetes are more common in individuals with age greater than 40 years²³.

To determine the possible role of obesity towards the causation of diabetes in HCV positive subjects, Body mass index of subjects was included and analyzed. The majority of HCV diabetic patients (46%) had BMI within the normal range i.e. Less than 25¹⁸. However as no comparative group was available to elucidate the role logistically and rationally, so this aspect needs to be further explored by larger and comparative studies. The younger individuals with HCV infection are at higher risk of developing diabetes as compared to their age mates who are not infected with HCV. As a result, diabetes screening and prevention in people with HCV infection might begin much earlier than the recommended age of 45 for the general population²⁴, particularly for individuals with higher BMIs or other diabetes risk factors. Additionally, young individuals with diabetes who live in areas where hepatitis C virus (HCV) infection is common might be screened for the virus.

The ALT level was also analyzed in our study and 16(32%) patients were having normal range, 21(42%) were in the range of 41-100 and only 13 (26%) patients having ALT level above 100.

Our study showed raised ALT levels in 68% of patients. A previous study done by Simo et al. reported elevated level of ALT in HCV positive patients²⁵. One of the study done in Taiwan reported age and level of ALT as predictive factors in patients with HCV infection²⁶.

CONCLUSION

Our study concludes that HCV infection is highly prevalent in patients with Type 2 Diabetes mellitus. The government should educate the general public about the risk of co-infection of HCV and Type 2 Diabetes mellitus. Our study recommends study based on large sample size and including multiple centers to get better results.

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