

In Type 2 Diabetic Patients Prevalence of Hepatitis C Virus Infection

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ABSTRACT

Objectives: To determine the prevalence of the hepatitis C virus in people with type 2 diabetes and to look for any links between the two

Study Design: Descriptive study

Place and Duration: Rural Health Centre Vanike Tarar, Hafizabad. April 2021-Dec 2021

Methodology: A total of 120 people with type 2 diabetes were included in the study. Patient's age ranged from 20 to 80 years. A specified Performa was used to record all of the relevant data. Complete data sets were analysed using SPSS 24.0.

Results: There were 55% males and 45% female in the entire study. Out of 120 confirmed diabetic patients, 40 (33.3%) were seropositive for anti HCV antibodies while 80 (66.7%) were negative. The sero-prevalence of HCV in female was 21 (52.5%) while in male it was 19 (47.5%).

Conclusion: Patients with Type 2 Diabetes mellitus are more likely to be infected with HCV, according to our research.

Keywords: Diabetes mellitus, Hepatocellular Carcinoma, Chronic Hepatitis C

INTRODUCTION

Chronic hepatitis is an inflammation of the liver brought on by a viral infection. It may manifest itself as either an acute or a chronic illness, with or without symptoms [1]. As a result of a variety of factors, including excessive alcohol use, toxic exposure, and underlying medical problems that decrease immune function [2, 3], this viral infection may induce liver damage and a host of other issues. Worldwide, HCV infection affects more than 170 million individuals [3, 4], making it a serious public health issue. HCV is a single-stranded RNA virus belonging to the Flaviviridae family with a positive RNA sequence. When it comes to the transmission of HCV, the most successful mechanisms are blood transfusion, organ donation, mother-to-child transmission during childbirth, and contact with infected blood or body fluids [5–7]. The most common reason for liver transplantation is chronic HCV infection [6].

People are being diagnosed with cirrhosis and liver cancer at an alarmingly high rate as a result of HCV, which has been associated with chronic liver disease [7]. Diabetic complications are more likely to occur in people who already have hepatitis C, which has been shown to be a trigger for the disease. People with hepatitis C virus (HCV) infection tend to have a greater risk of acquiring type 2 diabetes [8]. When the body's glucose homeostasis is out of balance, we get diabetes mellitus.

No vaccination or post-exposure prophylaxis is now available for hepatitis C, which is still a major public health issue. Long-term, chronic infection with this bacterium causes cirrhosis and hepatocellular carcinoma. Diabetes mellitus is linked to persistent HCV infection, according to research (DM). By modifying the host's innate immune response, this virus seems to affect glucose metabolism [12]. An altered insulin receptor substrate signalling pathway may be caused by alterations in glucose metabolism, lipid metabolism, and the production and activity of HCV core protein and hepatic tumour necrosis factor- α . [13] An investigation by Desbois et al. found that in comparison to healthy volunteers, HCV infection was highly associated with diabetic mellitus (DM) and insulin resistance. When it comes to the most prevalent liver problems, blood sugar swings are a major contributor to HCV infection. According to a systematic review and meta-analysis of 33 studies, HCV infection is associated with an increased risk of type 2 diabetes mellitus (T2DM), independent of the severity of the underlying liver disease. Pooled estimates from preliminary and prospective studies (OR adjusted = 1.68, 95 percent CI 1.15–2.20) showed a significant DM risk in HCV-infected patients compared to noninfected controls. [14] Between 7.4 to 43.2 percent of those with HCV have been found to have Type 2 Diabetes Mellitus (T2DM). Studies show that the prevalence of T2DM in HIV-infected individuals varies widely over the world, and that the data is inconsistent. [15]

The frequency of hepatitis C virus in people with Type 2

diabetes and the relationship between the two illnesses must be determined.

MATERIAL AND METHODS

This descriptive study was done in Rural Health Centre Vanike Tarar, Hafizabad. It was found that there were 120 confirmed type 2 diabetics who were tested for hepatitis C throughout the course of the one-year investigation. The ages of the patients ranged from 20 to 80 years in length. In our investigation, individuals with type 1 diabetes mellitus, patients with known likely HCV contact sources such as blood transfusions, surgical operations, hospitalisation, or dental treatments, and diabetic patients treated for HCV were all excluded. Patients without secondary diabetes mellitus caused by any of the aforementioned conditions were also included. The hospital received the approval of the ethics committee. A patient's written, informed permission was obtained before they were allowed to be admitted to the hospital. Personal details, illness duration, diabetes mellitus duration, and previous hospitalisation for surgical procedure, blood transfusion, past history of injectable drug usage and intravenous drip therapy as well as needle stick injuries, dental procedures or tattooing were all recorded in detail in order to identify possible sources of infection with the human cytoplasmic virus (HCV). Complete physical examinations were performed on all patients; measurements were taken, and BMIs were determined. An inquiry was carried out and anti-HCV antibodies were detected in a sample of venous blood delivered to the hospital laboratory. As a consequence of getting blood test results from laboratory, the frequency of patients with anti HCV antibodies was determined among the 120 type 2 diabetes patients. Treatment options for patients with positive anti-HCV antibodies were discussed, as well as the advantages of reducing the risk of hepatitis C. Patients who tested negative for anti HCV antibodies were informed of the disease's dangers and given advice on how to avoid it. The data were analysed using SPSS version 23. Documentation of mean and standard deviation was provided for quantitative data, whereas frequency and percentages were provided for quantitative data.

RESULTS

An overall number of 120 Type 2 Diabetes mellitus patients were included in the research project. In all, there were 55 percent men and 45 percent females participating in the research. (Figure 1)

Patients involved in the study had an average age of 46.12 years with a standard deviation of 9.34 years. Ages ranged from 20 years old to 80 years old. As you can see in Figure 2, the patients were distributed by age.

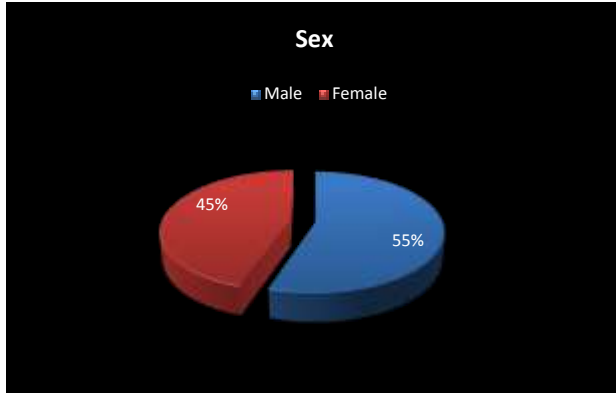


Figure 1: Gender wise distribution of patients

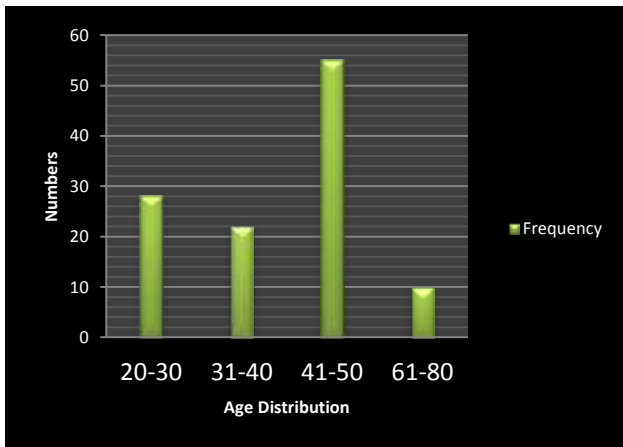


Figure 2: A breakdown of patients by age group

40 of the 120 confirmed diabetics were positive for anti-HCV antibodies, whereas the remaining 80 were negative for the infection. Among females, the prevalence of HCV was 52.5 percent, whereas among males it was 19 percent (47.5 percent). (Table 1)

Table 1:

Variables	Frequency	Percentage
HCV		
Yes	40	33.3
No	80	66.7
Gender Wise HCV		
Male	19	47.5
Female	21	52.5
Total	40	100

19 (47.5%) of the 40 HCV patients had a BMI below 25, followed by 17 (42.5%) with a BMI between 26 and 30. (Table 2)

Table 2: HCV-infected individuals' BMI

BMI	Seropositive Patients	%age
< 25	19	47.5
26-30	17	42.5
31-35	4	10
Total	40	100

Table 3: Patients with HCV who have elevated levels of ALT in their blood

ALT levels	No of patients	Percentage
5-40 IU/L	14	35
41-100 IU/L	16	40
>100 IU/L	10	25
Total	40	100

More than half of the patients had ALT levels that were within the range of 41-100, with only 10 (25 percent) of those patients having ALT levels that were over 100. (Table 3).

DISCUSSION

One-third of the 120 verified diabetic patients in our research had anti-HCV antibodies, whereas the other two-thirds, or 80 out of 120, had none. Type 2 diabetes patients had a 27.6 percent HCV prevalence rate in prior research [16], which also found similar results. The findings of a second investigation were likewise similar [17]. HCV was also shown to be frequent among diabetics in a research by Ali et al. [18]. The findings of the Knobler and Schattner study[19] also showed a strong link between HCV infection and Type 2 Diabetes mellitus.

The seroprevalence of HCV in female was 21 (52.5%) while in male it was 19 (47.5%). Cacoub et al. observed a significant frequency of HCV in females in a prior study[20]. Other research found no difference in the outcomes between men and women[21].

We used age stratification to explore the link between HCV infection and diabetes mellitus since age is a key risk factor for the disease. Older age groups had a higher prevalence of HCV than younger age groups. Most of the individuals who tested positive for antibodies were between the ages of 41 and 50. Another research by Mehta et al. found that those over the age of 40 are more likely to develop type 2 diabetes[22].

The BMI of the respondents was included and examined in order to discover if obesity may have a role in the development of diabetes in HCV-positive individuals. There were 47.5 percent of HCV diabetic patients with a BMI below 25, which is considered normal. It is, nevertheless, necessary to conduct bigger and more comparable research in order to better understand the function of logistics and rationality. In comparison to their age peers who are not infected with HCV, those who are younger with HCV infection have a greater chance of acquiring diabetes. Diabetes screening and prevention in HCV-infected persons may need to begin earlier than the recommended age of 45 for the general population, especially for those with higher BMIs or other risk factors for diabetes. HCV screening may also be performed on young diabetics who reside in places where the disease has a high prevalence.

More than half of the patients had ALT levels that were within the range of 41-100, with only 10 (25 percent) of those patients having ALT levels that were over 100. ALT levels were shown to be higher in HCV positive individuals in a research by Simo et al.[24] Age and the amount of ALT were shown to be prognostic indicators in Taiwanese patients with HCV infection, according to a research.[25] . It is also important to investigate the impact of distinct HCV genotypes on the development of type 2 diabetes. The genotypes 1 and 4 have been shown to be prevalent in large proportions in diabetes patients in earlier investigations [26,27].

CONCLUSION

According to the findings of our research, persons with Type 2 diabetes are at significant risk of HCV infection. The general people should be informed about the dangers of HCV and Type 2 Diabetes mellitus co-infection by the government. To achieve the best results, we suggest doing a research with a high sample size and including numerous sites.

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