



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3665994>Available online at: <http://www.iajps.com>

Research Article

**HCV INFECTION AND TYPE II DM: A CROSS SECTIONAL
STUDY**¹Dr. SYED MOHSIN ALI, ²Dr. SYEDA UMM A OMARAH GILANI,³Dr. SYEDA AMINA BATOOL¹School of Medicine and Nursing, Dezhou University, Shandong, China²Lenox Hill Medical Diagnostic Imaging Center, New York³Kishwar Fazal Teaching Hospital, Sheikhpura, Pakistan**Article Received:** December 2019 **Accepted:** January 2020 **Published:** February 2020**Abstract:**

Objective; To determine the frequency of type II DM in cases of chronic HCV infection. **Material and methods;** This was a cross sectional study conducted at Kishwar Fazal Teaching Hospital, Sheikhpura, Pakistan during July to December 2018. In the present study, 200 cases with age range of 18 to 60 years of either gender having known history of HCV infection and no previous history of DM were included. HCV was detected on PCR by qualitative method. DM was labeled as yes where the fasting blood glucose was more than 126 mg/dl. **Results;** A total of 200 patients of chronic hepatitis C were included in the study. Out of 200 patients, 120 were males (60%) and 80 (40%) were females. The mean age of patients was 47.25 ± 11.02 (SD) with the range of 35-74 years. The frequency of diabetes mellitus among hepatitis C patients was seen in 56 (28%). Out of 56 diabetic patients, 30 (53.57%) had positive family history of Diabetes Mellitus ($p = 0.001$). Of the 56 diabetics, only 14 had BMI less than 25 kg/m² while 42 had BMI more than 25 ($p = 0.009$).

Conclusion; Type 2 Diabetes Mellitus occur frequently in patients with chronic Hepatitis C infection. Positive family history of diabetes mellitus and increased BMI are significantly associated with this.

Key word; HCV infection, type II DM

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Please cite this article in press SYED MOHSIN ALI et al., *HCV Infection And Type II DM: A Cross Sectional Study.*, Indo Am. J. P. Sci, 2020; 07(02).

INTRODUCTION:

Hepatitis C virus (HCV) has been identified as one of the leading causes of chronic liver disease with serious sequel as the end stage of cirrhosis and liver cancer. According to recent statistics, the worldwide prevalence of HCV infection is ~3% and affects around more than 170 million people globally. Chronic hepatitis C infection mainly affects liver but can be associated with various extrahepatic manifestations including cryoglobulinemia, sialadenitis, glomerulonephritis, and porphyria cutanea tarda.¹

Diabetes mellitus is a chronic disease of metabolism causing abnormal glucose homeostasis. More than 171 million people globally are affected by diabetes mellitus, and the figure is expected to rise up to 366 million by 2030. A systemic review and meta-analysis from South Asia by Jayawardena et al. (2012) showed burden of diabetes in Pakistan ranging from 3% to 7.2% in a general population. Type 2 diabetes mellitus in South Asian, when comparing with European individuals, is 4- to 6-fold more prevalent.²

Several studies reported that HCV infection may also contribute to the development of diabetes, and higher prevalence of type 2 diabetes mellitus has been observed in the developed world (2% to 9.4%) in patients with HCV infection than in those with other forms of chronic hepatitis. This association between HCV infection and diabetes was for the first time made by Allison et al. in 1994. Since then, a number of observational studies have been published.

There are several organized factors which influence the development of diabetes among HCV-infected patients like age, sex, family history of diabetes, African-American race, and HIV coinfection.³

Insulin resistance (IR) and diabetes can develop at any stage of HCV infection. Multiple mechanisms have been accounted for insulin resistance and development of diabetes in patients with chronic hepatitis C. It promotes IR mainly through interfering with insulin signaling pathway in hepatocytes, increasing inflammatory response with production of cytokines such as TNF alpha and IL-6 and increasing oxidative stress. There are many studies in the past done on frequency of diabetes in HCV infection. One such study was conducted by Elhawary et al. (2011) that shows 13.84% prevalence of type 2 diabetes mellitus in HCV seropositive patients and also linked association of cirrhosis with diabetes mellitus. HCV infection and type 2 diabetes mellitus are two chronic conditions which contribute to a significant morbidity and mortality. The rationale behind this

study is to find out the maximum number of type 2 diabetes in those patients who are infected with hepatitis C virus and also the relation between cirrhosis and type 2 diabetes mellitus seropositive patients; so in this way, we will establish a valid association between type 2 diabetes in HCV seropositive population.⁴⁻⁵

Objective;

To determine the frequency of type II DM in cases of chronic HCV infection.

Study setting;

Kishwar Fazal Teaching Hospital, Sheikhpura, Pakistan

Study design;

Cross sectional study

Study duration;

July to December 2018

Sampling techniques;

Non probability consecutive sampling

MATERIAL AND METHODS:

In the present study, 200 cases with age range of 18 to 60 years of either gender having known history of HCV infection and no previous history of DM were included. HCV was detected on PCR by qualitative method. DM was labeled as yes where the fasting blood glucose was more than 126 mg/dl. The data was entered and analysed using SPSS version 20.0. Chi square test was used to see the effects of effect modifiers and p value less than 0.05 was considered as significant.

RESULTS:

A total of 200 patients of chronic hepatitis C were included in the study. Out of 200 patients, 120 were males (60%) and 80 (40%) were females. The mean age of patients was 47.25 ± 11.02 (SD) with the range of 35-74 years. The frequency of diabetes mellitus among hepatitis C patients was seen in 56 (28%). Out of 56 diabetic patients, 30 (53.57%) had positive family history of Diabetes Mellitus ($p = 0.001$). Of the 56 diabetics, only 14 had BMI less than 25 kg/m² while 42 had BMI more than 25 ($p = 0.009$).

DISCUSSION:

Chronic Hepatitis C and Diabetes mellitus cause devastating long-term complications in a significant minority of patients. A link between the two disorders would not be surprising. Chronic Hepatitis C infection can cause cirrhosis, which, through IR, predisposes the patient to Diabetes Mellitus. Recent cross-sectional studies performed worldwide suggest that they are indeed closely

linked. Many of previous investigations have documented an association between HCV infection and T2DM. Present study, also supports detection of increased risk for T2DM among HCV patients as more than quarter of Chronic Hepatitis C patients had Diabetes. A study conducted at Karachi by Qureshi et al shows that 24.5 percent of HCV positive patients had Diabetes Mellitus.⁶ Another study conducted in Islamabad shows that 18 percent cases of HCV infection have Diabetes Mellitus.⁷ The results of current study also correlates with other studies conducted in different parts of the world like China 19.05percent, Italy 32.5percent, Los Angeles 21percent, Israel 86.33percent and Korea 24percent.

Allison and co-workers found that among patients with cirrhosis awaiting transplantation, those who were infected with HCV were 5 times more likely to have T2DM than those who were not, regardless of sex, BMI or severity of liver disease.⁸ Our study shows that increasing age is a risk factor for T2DM in HCV infected patients as 68.2 percent patients who had Diabetes Mellitus were over 45 years of age. The study of Mitchell et al and Shurti et al shows that patients with old age are at high risk to develop Diabetes Mellitus than those who were younger and our findings are in agreement with it.⁹⁻¹⁰ Positive family history of Diabetes Mellitus is a risk factor for the development of T2DM in chronic Hepatitis C patients and present study proves the same as more than half of diabetic patients had positive family history of Diabetes Mellitus. The results correlates with another study conducted by Samir et al that shows that 41.08 percent had positive family history of Diabetes Mellitus and the prevalence of Diabetes Mellitus was significantly increased in subjects with HCV infection compared to those with HBV infection 56.5 percent against 2.7 percent.¹¹ Obesity has been shown to be among the most important risk factors for T2DM. In our study, only quarter of diabetic patients had BMI less than 25 kg/m². Other studies also show the same relation of obesity with Diabetes Mellitus. Another study shows that approximately 20percent of patients with HCV infection were obese and that obesity in those individuals was associated with steatosis and progression of fibrosis.¹² Nevita et al reported that BMI was associated with increased risk of Diabetes Mellitus in patients with HCV genotype 1 and 2 and who had no family history of Diabetes Mellitus.¹³

CONCLUSION:

Type 2 Diabetes Mellitus occur frequently in patients with chronic Hepatitis C infection. Positive family history of diabetes mellitus and increased BMI are significantly associated with this.

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