

Incidence and Type II Diabetes Mellitus Risk Factors in Chronic Hepatitis Type C Affected Patients

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ABSTRACT

Background: Type II diabetes is common among patients with chronic hepatitis C. The aim of the study is to govern the risk factors and prevalence of type II diabetes mellitus in chronic hepatitis C patients.

Place and Duration: The study was held among 100 patients with chronic hepatitis C enrolled in the Liver Clinic of Bilawal Medical College Hospital Kotri one-year duration from January 2019 to January 2020.

Methods: This is a cross-sectional study in which 100 patients with chronic hepatitis C virus who encountered the exclusion and inclusion principles were selected. Sex, height, age, smoking history, weight, body mass index and family history of diabetes were recorded, blood pressure was measured, and serum transaminase, total bilirubin, and albumin were tested. The analysis of the data was done using SPSS 23.0 statistics. The chi-square test was applied.

Results: Hundred patients with chronic hepatitis C were selected for the study, 58(50%) were male and 42 (42%) were female (Fig. 1). While the number of diabetic patients among HCV patients was 24 (30%), 56 patients (70%) had chronic hepatitis C without diabetes. The study group age varies from 32 to 73 years, with the mean being 45.42 ± 9.15 . 52 of the 100 patients were under 45 years of age (13 diabetic, 39 non-diabetic). In contrast, 48 patients were over 45 years of age (21 diabetics, 27 not). In the study group, family history with diabetes was positive in 35 (35%) of 100 patients, with diabetes and HCV in 21 and in 14 HCV without diabetes. The smoking history was positive in 33 (33%) of the 100 patients in the study group. The total number of subjects with less than 30 kg / m² BMI were 62 (62%) and patients with a body mass index above 30 kg / m² were 38.

Conclusion: Aging, elevated BMI and diabetes mellitus family history are considered risk factors for developing type-II diabetes mellitus in chronic hepatitis C affected patients.

Keywords: Type-II diabetes mellitus, Chronic Hepatitis C, Prevalence, risk factors.

INTRODUCTION

Hepatitis C infection is related with one of the chief health complications. About 170 million people globally suffer from chronic infections¹⁻². Hepatitis C was first dotted in 1975 and called non-A non-B hepatitis, with the highest incidence of HCV infection recorded in Pakistan. According to many studies, about 15% of Pakistani are carriers of HCV antibodies³⁻⁴. Active infection was found in 9.8%. Recently, several studies have identified HCV infection as a metabolic disorder and is therefore associated with hypertension, type II diabetes and cardiovascular disease. Diabetes is another leading cause of disability and death worldwide⁵. Nephropathy is considered a metabolic disease that may be complicated by retinopathy and neuropathy. Chronic hepatitis C has been found to be related to diabetes mellitus, and the incidence of type II DM is advanced in chronic hepatitis C patients than in other reasons of chronic liver disease⁶⁻⁷. There are several factors that influence the progress of diabetes in chronic hepatitis C patients, such as age, gender, diabetes mellitus family history and BMI. Metabolic disturbances in adipose tissue may result from persistent immune cell activation and cytokine release as a result of chronic inflammation in HCV patients, which may accelerate the onset of diabetes in these patients⁸⁻⁹. Several previous studies have shown that in chronic hepatitis C patients, the type II diabetes mellitus prevalence is 13-33%. Some studies in Pakistan showed that the incidence was around 25% and that HCV seropositive patients were three times further expected to progress towards diabetes than seronegative patients¹⁰⁻¹¹. The aim of the analysis was to evaluate the incidence of type II diabetes in chronic hepatitis C patients and to investigate the risk factors influencing it.

PATIENTS AND METHODS

The study was held among 100 patients with chronic hepatitis C enrolled in the Liver Clinic of Bilawal Medical college hospital, Kotri for one-year duration from July 2019 to July 2020. The study was

conducted in agreement with the guidelines of Ethics Committees. The study included a sample of 100 patients 35-75 years of age of either sex with HCV chronic hepatitis who included according to the inclusion criteria. HCV positive patients with documented positive HCV RNA by PCR tests and compensated liver function were registered in the study and a complete medical history was collected. Patients were especially asked about smoking and diabetes mellitus family history. The body mass index and blood pressure were recorded and a comprehensive physical examination was completed. Exclusion criteria include patients with non-HCV chronic hepatitis, decompensated liver disease, pregnancy, patients with a history of diabetes less than 30 years of age, thyroid disease, and patients with other causes of hyperglycemia such as acute pancreatitis or history of pharmacological drugs affecting glucose metabolism (corticosteroids, thiazide diuretics). After 8 hours of fasting, a blood sample was taken for fasting blood glucose, postprandial tests, HbA1c Level, complete liver function (ALT, AST, T. Bilirubin, s. Alb). Additionally, an ultrasound of the abdominal cavity was performed. The data was analyzed using SPSS 23.0 statistics. The Chi-square test was used and the p value <0.05 was measured statistically significant.

RESULTS

100 patients with chronic hepatitis C were enrolled in the study, 58 were male (50%) and 42 were female (42%) (Fig. 1).

While the number of diabetic patients among HCV patients was 24 (30%), 56 patients (70%) had chronic hepatitis C without diabetes. The study group age varies from 32 to 73 years, with the mean being 45.42 ± 9.15 . 52 of the 100 patients were under 45 years of age (13 diabetic, 39 non-diabetic). In contrast, 48 patients were over 45 years of age (21 diabetics, 27 not). In the study group, family history with diabetes was positive in 35 (35%) of 100 patients, with diabetes and HCV in 21 and in 14 HCV without diabetes.

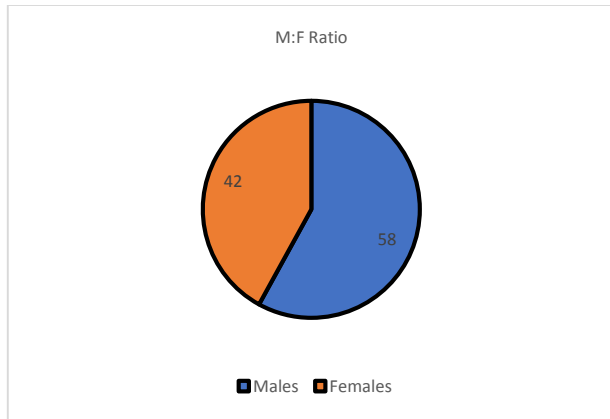


Table 1: The patients Characteristics of the study group (total number (n)=100)

Variable	Mean ± SD (%)
Age	45.42 ± 9.15
Sex	Male 58 (58%)
	Female 42 (42%)
Smoking	33 (33%)
Hypertension	24 (24%)
BMI kg/m ²	26.14±5.43
ALT (3-50 U/L)	74.48±9.8
AST (4-45U/L)	89.71±11.7
T. Bilirubin (0.5-1.5 mg/dl)	1.5±0.76
s. Alb (3.5- 5.2 g/dl)	3.1±1.12

The smoking history was positive in 33 (33%) of the 100 patients in the study group, 12 patients with HCV and DM (12%) and 21 HCV patients without DM and in 24 patients with the study group hypertension was found.

Table 2: Comparisons of diabetic and nondiabetic HCV patients

	Total	HCV with	HCV	P value	
		DM	without DM		
		N (%)	N (%)		
Age	<45 y	52 (52%)	13 (13%)	39 (39%)	p<0.001
	>45 y	48 (48%)	21 (21%)	27 (27%)	
sex	Males	58 (58%)	19 (19%)	38 (38%)	P>0.05
	Females	42 (42%)	15 (15%)	28 (28%)	
Family history of DM	+ve	35 (35%)	21 (21%)	14 (14%)	p<0.001
	-ve	65 (65%)	13 (13%)	52 (52%)	
Smoking	33 (33%)	12 (12%)	21 (21%)	P>0.05	
Hypertension	24 (24%)	10 (10%)	14 (14%)	P>0.05	
	< 30 kg/m ²	69 (69%)	15 (15%)	54 (54%)	P<0.05
	> 30 kg/m ²	31 (31%)	19 (19%)	12 (12%)	

The total number of patients with a BMI less than 30 kg / m² was 62 (62%) and patients with a BMI above 30 kg / m² were 38.

Table 3: Comparison of the biochemical profiles between diabetic and non-diabetic HCV patients

	HCV with DM	HCV without DM	P value
ALT (3-50 U/L)	110±33.51	74.35±29.11	P>0.05
AST (4-45 U/L)	90.48±16.42	66.26±19.48	P>0.05
T. Bil.(0.5-1.5 mg/dl)	2.9±0.55	2.1±0.82	P>0.05
s. Alb (3.5- 5.2 g/dl)	2.9±1.2	3.1±1.	P>0.05

The range of BMI in the study group was 22.5-37 kg / m², and the mean value was 25.21 ± 5.28 (SD) kg / m². Table (3) shows the mean ± SD of the different laboratory results in both groups. There was no statistical significance when comparing ALT, AST, T. Bilirubin, between diabetic and nondiabetic patients with HCV infection (P> 0.05).

DISCUSSION

Many clinical observations in chronic hepatitis C patients suggest that HCV may directly influence glucose metabolism¹². Allison et al. He made the first publication on the subject and concluded that the incidence of type II diabetes in chronic hepatitis due to HCV is 5 times higher than in chronic hepatitis due to other reasons¹³⁻¹⁴. This has been documented in other studies that have found a strong association between diabetes and HCV in patients with chronic hepatitis C by Shahid MA et al. In a similar study by Dilshad et al, which found a 26.4% incidence in our data and about 34.8%¹⁵⁻¹⁶. However, several studies have observed different ranges for the incidence of type II diabetes in HCV patients, Mansoor et al. They showed an incidence of 19.5%, while Fraser et al. Showed a higher incidence of 38% to 50%¹⁷. These figures can be compared with other surveys conducted in various countries, such as Italy 32.5%, Los Angeles 21%, Korea 24% and China 19%. In our group of patients, the gender did not differ significantly, but contrary to these results, a study by Caronia et al. Found that diabetes is more common in men with HCV¹⁸⁻¹⁹. Age was found to be an important variable (P<0.05). Obesity and overweight have been found to be among the major risk factors for the development of diabetes mellitus, especially in patients with chronic hepatitis C. HCV and DM have been observed to worsen as a result of co-infection. Therefore, weight control in obese HCV patients reduces the risk of diabetes and reduces the rate of progression of cirrhosis in these patients. In this study, when comparing BMI with diabetes in patients with chronic hepatitis C (P <0.05), a statistically significant difference was found²⁰. This is similar to the study by Narita et al. Documentation that an augmented jeopardy of DM in HCV patients is associated with a higher BMI. Although the exact etiology and pathogenesis of type II diabetes among HCV patients is not yet clear, there are several mechanisms that may explain this relationship, e.g., fatty liver, which appears to occur more frequently than others in chronic hepatitis C²¹⁻²². Moreover, it has been suggested that HCV infection markedly reduces insulin sensitivity, resulting in insulin resistance. In HCV patients, insulin resistance has been found to be associated with an inflammatory response due to cytokines such as IL-6, TNF alpha and oxidative stress. In addition, obesity-related metabolic changes lead to steatosis and hepatitis, resulting in impaired glucose tolerance and increased risk of diabetes²³.

CONCLUSION

Patients with hepatitis C, especially those with a diabetes mellitus family history, the elderly, and those with a higher body mass index are more probable to progress towards type II diabetes. Therefore, early detection and HCV infection treatment is essential to obtain a good result and reduce the complications and development of type II diabetes. However, it is recommended to look for more risk factors for the advancement of type II diabetes in HCV patients and to increase the sample size.

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