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STUDY TO KNOW THE DIABETES MELLITUS TYPE II PREVALENCE IN CIRRHOSIS PATIENTS RELATED WITH CHRONIC HEPATITIS C VIRUS INFECTION

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Abstract:

Objective: *To evaluate the type 2 diabetes mellitus frequency in patients with cirrhosis related with chronic HCV infection.*

Study design: *A descriptive study (case series).*

Place and Duration of the Study: *In the Medical Unit II of Services Hospital Lahore for one year duration from December 2017 to December 2018.*

Methods: *Eighty-three (83) patients were selected for the study after meeting clinical features, detailed history, and detailed clinical examination of cirrhosis. Relevant research including liver function tests, abdominal ultrasound and glycemic levels were checked.*

Results: *Eighty-three (83) cirrhosis patients were selected for the analysis. Of the 83 patients, 30 (30) had diabetes mellitus type 2 in almost 36% of the patients. Diabetes mellitus type I prevalence was higher in the 41-60 age group. More precisely, we found that patients who had cirrhosis for more than 4 years were more likely to be diabetic.*

Conclusion: *We found higher type 2 diabetes mellitus in cirrhosis patients associated with chronic HCV infection in our patient group.*

Key words: *chronic hepatitis C, diabetes mellitus type 2, cirrhosis, impaired fasting glucose.*

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INTRODUCTION:

A disease having significant global impact is Hepatitis C. The hepatitis C virus (HCV) was detected in 170 million people according to the WHO which corresponds to 4% of the Global population. There are huge variations region wise. In Egypt, the incidence is 20% and highest among the world. With HCV, it is suggested that 10 million people approximately in Pakistan are infected. HCV is one of the main causes of cirrhosis in the world. In patients having cirrhosis have diabetes mellitus in 30%. In the last decade, it has been hypothesized that DM may be one of the additional liver conditions attributable to chronic HCV infection. A study in the United States showed that patients aged ≥41 years having chronic HCV infection were having type 2 diabetes mellitus 3 times more than in not detected with HCV infection. Diabetes treatment is complicated by hepatotoxicity and hepatic damage by oral anti-diabetic drugs. The patient with cirrhosis and diabetes undergoes cirrhosis related complications which may result in death more frequently.

MATERIALS AND METHODS:

This descriptive study was held in the Medical Unit II of Services Hospital Lahore for one year duration from December 2017 to December 2018. With chronic HCV infection affected patients at any age and sex with cirrhosis were included in the analysis. From all patients, written informed consent was taken. All patients were admitted to the ward through the outpatient department (OPD). Researches such as fasting blood sugar and random blood sugar were carried out in central laboratory. The data was entered with SPSS version 17.0. Descriptive statistics were used to calculate the mean ± standard deviation for age, gender, cirrhosis time, random blood glucose (RBS) and fasting blood glucose (FBS). The frequencies were calculated by age, gender and type 2 diabetes mellitus, and stratification was made in terms of age, gender and duration of cirrhosis to see the effect of these on patient outcomes. Since it was a descriptive study, the significance test was not used and the significance level was not calculated (p-value).

RESULTS:

The mean age of the patients was 16.799 SD **(Table 1).**

Table 1: Age distribution of patients with cirrhosis associated with chronic HCV (n = 83)

N	83
Mean	42.71
Std.Deviation	14.299

Mean age ± SD = 42.71 ± 14.299 years

Of these 83 cirrhotic patients, 3 (3.6%) were under 20 years of age; 35 patients (42.2%) were between 21 and 40 years old; 32 patients (38.5%) were between 41 and 60 years old; 8 patients (9.6%) were between 61 and 70 years old; and 5 (6%) patients were older than 70 years. The age distribution of cirrhosis patients included in this study is shown in **(Table 2).**

Table 2 Mean age of cirrhotic patients with chronic hcv included in this study (n=83)

Mean age	Frequency	%age
<20	3	3.6
25	15	18.1
35	20	24.1
45	22	26.5
55	10	12
65	8	9.6
>70	5	6

Eighty-three (83) cirrhosis patients were selected for the analysis. 39 female and 44 male patients (53.01%) patients (46.99%) were selected **(Table 3).**

Table 3: Gender distribution of cirrhotic patients with chronic HCV (n=83)

Gender	n=	%age
Male	44	46.99
Female	39	53.01

Distribution by gender was not significant for the development of type 2 diabetes mellitus in patients with cirrhosis associated with HCV infection. The mean age of the patients with male dominance cirrhosis was 42.95 ± 14.24 (SD). The patients mean age with cirrhosis was 42.44 ± 15.05 (SD) **(Table 4).**

Table 4 Gender distribution of cirrhotic patients with chronic HCV according to mean age

Mean Age	Male	%age	Female	%age
< 20	1	1.2	2	2.4
25	8	9.6	7	8.4
35	11	13.2	9	10.8
45	12	14.4	10	12.0
55	5	6.0	5	6.0
65	4	4.8	4	4.8
> 70	3	3.6	2	2.4
Total	44	53.01	39	46.99%

Mean Age for male patients ± SD =42.95 ± 14.24 years
Mean Age for female patients ± SD = 42.44 ± 14.55 years

Diabetes mellitus type 2 developed in 30 (30) out of 83 patients, ie 36% of patients **(Table 5).**

	Frequency	%age
Non diabetic	53	63.9
Diabetic	30	36.1

As seen **(Table 6)**, there were 17 male (56.66%) and 13 female (43.33%) HCV-related cirrhosis type 2 diabetes mellitus in these 30 patients.

Table 6 Gender distribution of diabetic patients in cirrhosis associated with chronic HCV (n=83)

Mean Age	Diabetic	Male	Female
< 20	2	1	1
25	3	2	1
35	4	2	2
45	6	4	2
55	5	3	2
65	6	3	3
> 70	4	2	2

Mean Age of Male Diabetic Patients in Cirrhosis Associated with HCV ± SD = 48.24 ± 16.20 years
Mean Age of Female Diabetic Patients in Cirrhosis Associated with HCV ± SD = 50 ± 17.20 years

The mean age of male diabetic patients in HCV-related cirrhosis was 48.24 ± 16.20 (SD), while the HCV-related cirrhosis in patients the mean age was 50 ± 17.20 years. The diabetes mellitus type 2 prevalence was higher in the 41-60 age group, in this specific age group there were 7 (23.33%) male patients and 4 (13.33%) female patients (Table 6). The age distribution of chronic HCV-related cirrhosis according to the sex of diabetic and non-diabetic
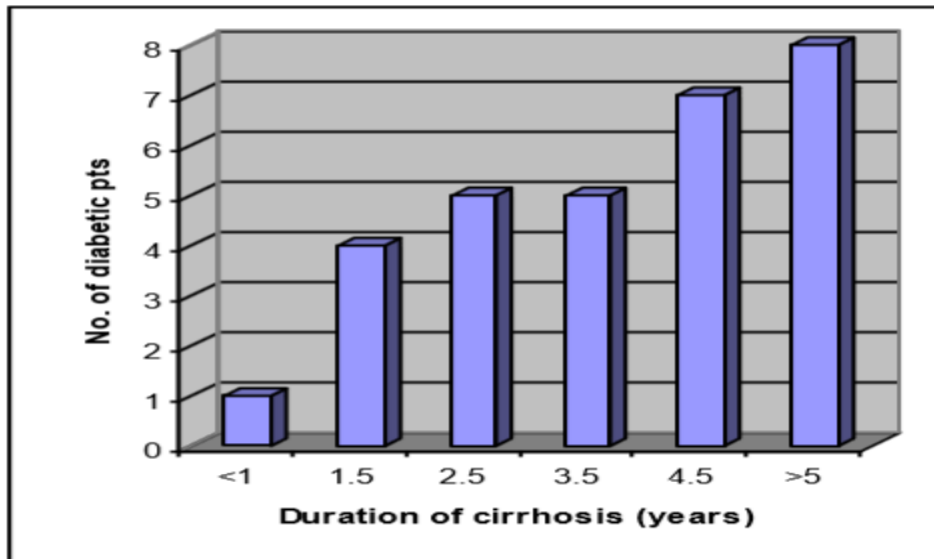
patients is shown in Table 6. Patients with (FBS)> 126 mg / dl and (RBS)> 180 mg / dl were labeled as type 2 diabetic in two separate cases (Table 7). According to the above criteria, 2 (6.67%) of these 30 type 2 diabetic patients were under 20 years of age; 7 patients (23.33%) were between 20 and 41 years old; 12 (35.07%) patients were between 41 and 60 years old; 6 (20%) patients in 61-70 years; Four patients (13.33%) were older than 70 years **(Table 7).**

Table 7: Identification of type 2 diabetes mellitus in HCV cirrhotic patients using fasting blood sugar and random blood sugar levels

Mean age of HCV cirrhotic patients	Fasting Blood Sugar (FBS)mg/dl		Random Blood Sugar (RBS)mg/dl	
	100–126	>126	160–180	>180
<20	1	2	1	2
20–40	28	7	28	7
40–60	21	11	21	11
60–70	2	6	2	6
>70	1	4	1	4

In addition, the relationship between the type 2 diabetes mellitus in HCV-associated cirrhosis patients and duration of cirrhosis was investigated. One (1) patient developed type 2 diabetes mellitus in less than 1 year; four (4) patients diagnosed with diabetes mellitus type 2 between 1 and 2 years; between 2 to 3 years five (5) patients diagnosed with diabetes mellitus type 2; Type 2 diabetes mellitus developed in 5 patients between 3-4 years; In 7 patients, Diabetes mellitus type 2 was detected and in eight patients after 5 years **(Figure 1).**

Fig.1: Association between Development of Type 2 Diabetes Mellitus in HCV Cirrhotic Patients and Duration of Cirrhosis (n = 30)

As the result of the study, age and cirrhosis duration increased, the incidence of type 2 diabetes mellitus was much higher in patients with chronic HCV-related cirrhosis. As shown in Table 6 and Figure 1, patients with cirrhosis at 41 to 60 years and more than 4 years are likely to be diabetic.

DISCUSSION:

In our study, thirty (30) of the 83 cirrhotic patients with HCV were diabetic, ie almost 36% of patients developed type 2 diabetes mellitus in cirrhosis associated with chronic HCV infection. In a study conducted in HCV-infected cirrhosis patients, the prevalence of type 2 diabetes was higher than that reported in patients with chronic hepatitis and ranged from 19.6% to 50%. In another US study, the prevalence of type 2 diabetes mellitus associated with

HCV infection is 21 to 23%. In two different studies, one in Korea and one in Egypt found that almost 25% of patients had chronic hepatitis C-related diabetes mellitus. Another study in Italy reported that 39% of HCV patients had diabetes. In another study conducted in Pakistan, the prevalence of type 2 diabetes mellitus in HCV-associated cirrhosis patients was 31.25%. In our study, we observed that patients between 41 and 60 years of age were more likely to be diabetic. This result is suitable for another study conducted in the United States. Mehta et al found that patients with chronic HCV infection ≥40 years of age were more than three times more likely to have type 2 diabetes mellitus than those without HCV infection. In our study, gender distribution was not significant in the development of type 2 diabetes mellitus in patients with cirrhosis associated with HCV infection. This is equal to the number of chronic HCV-related male and female diabetic cirrhosis patients, Khokhar et al also participates in another paper indicating that gender difference does not explain the increased risk of diabetes in patients with hepatitis C. In our study, we found that the duration of cirrhosis was directly proportional to the development of type 2 diabetes mellitus in HCV-related cirrhosis patients. More precisely, we found that patients who had cirrhosis for more than 4 years were more likely to be diabetic. This finding is consistent with Blanco et al, Which indicates that clinically manifested manifestations of diabetes as clinically worsening liver function, so diabetes mellitus type 2 can be considered as an indicator of advanced cirrhosis. Although this study is performed at regional level, it can be considered as an indicator of the prevalence of type 2 diabetes mellitus in cirrhotic patients with chronic HCV infection in other regions of Pakistan. In addition, the findings in this study are consistent with other studies conducted in different developed countries of the world.

CONCLUSION:

There have been many advances in the patients with cirrhosis clinical care and end-stage liver disease the complications. Many of them have focused on the treatment of complications and to combat the underlying cause of cirrhosis. This study of cirrhotic patients with hepatitis C having chronic infection showed a higher frequency of type 2 DM in cirrhotic patients with chronic HCV infection. It suggests that the persistent and / or active phase of HCV infection is linked with type 2 diabetes mellitus.

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