The Frequency of Type 2 Diabetes Mellitus in Chronic Hepatitis C Patients

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ABSTRACT

Background: Hepatitis C virus is the causative agent for chronic hepatitis C (CHC) infection victimizing around 200 million people globally.

Aim: To determine the association of HCV infection with diabetes mellitus (DM).

Methodology: This descriptive cross sectional study with chronic HCV infection was carried out in the Department of Gastroenterology of Ayub Teaching Hospital Abbottabad from February to July 2019 after the Hospital's Ethical Committee approval. Blood sampling for anti HCV antibody by enzyme-linked immunosorbent assay (ELISA), glycosylated hemoglobin (HbA1c), and Fasting and Random blood sugar was used. SPSS version, 20 analyzed the collected data.

Results: All patients (n=139) had a mean age of 52.49±12.465 years. In frequency of gender of patients there were 75(54%) male and 64(46%) female. In frequency of type 2 diabetes mellitus patients who were hepatitis C positive by ELISA, 22(15.8%) had diabetes and 117(84.2%) had no diabetes.

Conclusion: We concluded that the Type 2 Diabetes Mellitus occur frequently in patients with chronic Hepatitis C infection, growing age and positive family history of diabetes mellitus.

Keywords: Hepatitis C, Type 2 diabetes mellitus and Obesity.

INTRODUCTION

Hepatitis C virus is the causative agent for chronic hepatitis C (CHC) infection victimizing around 200 million people globally. It is the most common cause of hepatoma, and the most common reason for liver transplantation in the civilized world[1].

Previously, 6 genotypes of HCV of were identified; however, now, it is believed that there are 7 major genotypes with numerous subtypes. In Pakistan, genotype 3a and 2a are far more prevalent with other genotypes found in other parts of the world[2].

According to one estimate, it is found in every 20th Pakistani, thus making it one of the most prevalent disease in Pakistan[3]. A systematic review revealed that 6.8% of all population in Pakistan has HCV infection whereas the disease being active in almost 6% of all population. Use of contaminated syringes, contaminated barber razor, non-sterilized dental procedures, tattooing and ear piercing is considered to have caused such high prevalence in Pakistan[4,5].

It can cause a number of complications that include hepatocellular carcinoma, liver cirrhosis, cryoglobinemia, hypolipidemia, metabolic syndrome especially diabetes mellitus. This is because HCV infection leads to certain metabolic alterations causing an increased insulin resistance leading to the development of diabetes. This has been reported by several studies; according to one, 33% of patients with HCV have diabetes while another reported the prevalence of diabetes in HCV to be 9.4%. Still others have reported that the overall prevalence of diabetes mellitus

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(DM) among chronic HCV-seropositive populations in North America, Europe, the Middle East, and Asia ranges from 13-33%[6].

In the light of increasing burden of HCV among diabetic patients and due to the lack of local data available, We carried out this study to see to find out the frequency of type 2 diabetes mellitus in chronic hepatitis C patients.

METHODOLOGY

This descriptive cross sectional study with chronic HCV infection was carried out in the Department of Gastroenterology of Ayub Teaching Hospital Abbottabad from February to July 2019 after the Hospital's Ethical Committee approval. Blood sampling for anti HCV antibody by enzyme-linked immunosorbent assay (ELISA), glycosylated hemoglobin (HbA1c), and Fasting and Random blood sugar were used. The calculated sample size was 139 following the methodology adopted in one previous study with modification.[7] The current study included both genders with age range (20-70 years) and those who were positive on ELISA for Hepatitis C. Patients with pre-existing liver diseases, any malignancy, pregnancy, taking immune-suppressant drugs and who failed to give informed consent were excluded from the project. All patients gave written informed consent at enrollment time.

Data analysis: Data was analyzed by SPSS version 20. Age (in years) was presented as mean± S.D. Parameters like sex, obesity and individuals suffering type 2 diabetes mellitus were presented as frequency and percentages. Outcome variable was stratified among gender, obesity and family history for diabetes to see the effect modifications.

Post stratification chi-square test at 5% level of significance was used.

RESULTS

The distribution of patients depending on sex, obesity and family history for diabetes was shown in table-1. Among 139 enrolled patients, age was divided into different age groups represented as mean±S.D in table 2. The relationship between obesity and diabetes mellitus among patients of HCV was shown in table-3 with p-value. The relationship of family history for diabetes and its incidence was summarized in table-4.

Table 1: General characteristics of patients as frequency & percentage

Variables	Categories	Frequency	%age
Gender	Males	75	54
	Females	64	46
Obesity	Yes	19	13.7
	No	120	86.3
Positive family history for diabetes	Yes	25	18
	No	114	82

Table 2: Different age groups among enrolled patients with mean±S.D

Age (Years)	Patient is having type 2 Diabetes	
	Yes	No
20 – 35	4 (2.9%)	12 (8.6%)
36 – 50	5 (3.6%)	42 (30.2%)
51- 65	8 (5.8%)	42 (30.2%)
> 65	5 (3.6%)	21(15.1%)
Mean± SD	52.49±12.465 years	
Range (years)	2 0 – 7 0	

P value 0.534

Table 3: Relationship between obesity and diabetes mellitus among patients of HCV

Obesity	Patient is having type 2 Diabetes	
	Yes	No
Yes	7 (5%)	12 (8.6%)
No	15(10.8%)	105 (75.5%)
Total	22 (15.8%)	117(84.2%)

P value 0.007*,   *Statistically Significant

Table 4: Family history for diabetes and its incidence among enrolled patients

Positive family history for diabetes	Patient is having type 2 Diabetes	
	Yes	No
Yes	22 (15.8%)	3 (2.2%)
No	0 (0%)	114 (82%)
Total	22 (15.8%)	117(84.2%)

P value 0.000*   *Statistically Significant

DISCUSSION

Hepatitis C infection approximately target 200 million people globally. One previous literature review revealed that 5.3% Pakistani population was affected by this virus even today[4]. It's a curable disease only by viral eradication but that needs proper medication for long duration of time. Treatment with pegylated interferon alpha-2b or its combination with other antiviral drugs is the standard option for HCV management.

Age (mean ± SD) of enrolled patients in our study was 52.49±12.465 years (Table-2) in conformity with the previous study where age (mean ± SD) of enrolled HCV infected patients among Dutch population was 46.5±9.6 years.[7]

Both males and females were recruited in our work as in other previous studies. Females were 64(46%) while males were 75 (54%) (table-1) depicting the fact that males suffer more from HCV infection than females across Pakistani population respectively as well as globally[8]. Use of contaminated syringes and contaminated barber razors are the major contributing factors among males for this disease.

In our study the frequency of type 2 diabetes mellitus patients who were hepatitis C positive by ELISA, 22(15.8%) had diabetes and 117(84.2%) had no diabetes. In this study the frequency of obese patients there were 19(13.7%) had obesity while remaining 120(86.3%) had normal or underweight. As in the study of Hammerstad SS et.al revealed that the overall prevalence of DM among chronic HCV population ranges from 13-33% almost the results of our study regarding diabetes among chronic hepatitis C were the same[6].

In this study the frequency of patients with family history of type 2 diabetes mellitus who were hepatitis C positive by ELISA, 25(18%) had diabetic family history and 114(82%) had no diabetic history. The results of this study regarding family history of diabetes with regard to HCV were around the study conducted by Zein NN et al[7].

In our study the stratification of age with respect to patient having type 2 diabetes mellitus were 4(2.9%) in age group of 20 to 35 years, 5(3.6%) in age group of 36 to 50 years, 8(5.8%) in age group of 51 to 65 years and 5(3.6%) were in age group of above 65 years with insignificant p-value (0.534)[9,10].

This study showed that the frequency of obese patients distribution with respect to diabetic patients were 7(5%) had obesity while and 12(8.6%) non-diabetic had obesity while remaining 117(84.2%) had normal or underweight with significant p-value (0.007*)[11,12].

CONCLUSION

We concluded that the Type 2 Diabetes Mellitus occur frequently in patients with chronic Hepatitis C infection, growing age and positive family history of diabetes mellitus.

Limitations: It was a single center study carried with small sample size as well as limited resources and time constrain.

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