

Original Article

FREQUENCY OF TYPE-2 DIABETES MELLITUS IN PATIENTS WITH HEPATITIS C VIRUS GENOTYPE 3(A)

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Objective: To evaluate the frequency of type-2 diabetes mellitus in patients having hepatitis C virus genotype 3(a) infection, which is the most common type of genotype in our population.

Material and Methods: A total number of 200 were enrolled from outpatient department of services hospital Lahore which is a tertiary care hospital. This was a descriptive, cross sectional survey. Both male and female patients fulfilling the inclusion and exclusion criteria were included in the study. The patients having chronic hepatitis C infection with genotype 3(a) were screened for diabetes mellitus according to the operational definition.

Results: A total number of 200 patients including 114 males and 86 females were enrolled for study. Their ages ranged from 25 to 60 years. Type 2 diabetes mellitus was found in 54.42 % (n=80) male patients and 45.58 % (n=67) female patients. Out of 200 patients having HCV genotype 3(a) infection, 147(73.5%) had diabetes mellitus.

Conclusion: We concluded that frequency of type-2 diabetes mellitus is high among patients with hepatitis C virus genotype 3(a). So it is recommended that every patient who presents with hepatitis C virus genotype 3(a) infection should be screened for type-2 diabetes mellitus. Furthermore, it is also recommended that every setup should have close surveillance of their patients in order to know the frequency of the problem.

Keywords: Hepatitis C virus, hepatitis C virus genotype 3(a), type-2 diabetes mellitus.

Introduction

Hepatitis C virus (HCV) is a major cause of chronic liver disease affecting an estimated 170 million people worldwide.¹ In Pakistan more than 10 million people are living with Hepatitis C virus, with high morbidity and mortality.² Persistent chronic liver damage eventually progresses from chronic hepatitis to cirrhosis and hepatocellular carcinoma (HCC).³ Although the main target of HCV is liver but it has been associated with diseases of other organs as well. It has been reported that 38% of patients with HCV would manifest at least one extra hepatic manifestation during the course of illness.⁵

Type 2 diabetes mellitus is a common complication of all liver diseases, independent of the etiology especially at the advanced stage. However, clinical and experimental data has suggested a direct role of HCV in the alteration of glucose metabolism.⁴ The relationship between diabetes mellitus and HCV infection has been challenging in the recent decade in the world and has been studied from several aspects.⁵ Review of literature from different parts of the world illustrates that 23% to 62% of patients with chronic HCV infection have associated diabetes mellitus especially type 2 DM. However association of type 2 diabetes mellitus with specific

genotype of HCV has been less studied.

Genotype 3 (a) is the commonest type found in HCV infected patients in our setup. Although an epidemiologic link between hepatitis C and type 2 diabetes mellitus is an established fact but there are not many studies regarding frequency of type 2 diabetes mellitus in patients having genotype 3 (a) HCV infection which is the commonest genotype in Pakistan.⁶ Therefore, this study was planned to identify type 2 diabetes mellitus in patients having HCV infection with genotype - 3(a).

Furthermore among⁶ genotypes of HCV, genotype 3 (a) has highest sustained viral response,⁷ but diabetes mellitus is known to reduce the treatment response.⁸ Therefore identification of type 2 diabetes mellitus in specific genotype infection in our population will be beneficial in planning the treatment of HCV infection.

Material and Methods

This descriptive cross sectional survey with non probability purposive sampling technique was carried out on 200 patients in medical unit-I, SIMS/Services Hospital, Lahore. With following inclusion and Inclusion criteria.

- Age between 25-60 years

- Gender: male and female
- All diagnosed cases of Hepatitis C virus, genotype 3 (a).

Exclusion criteria:

- Patient with increased BMI, i.e. ≥ 28
- Family history of diabetes mellitus (History and medical record)
- Already diagnosed patients of type 2 diabetes mellitus (History and medical record)
- Patients who are on interferon and ribavirin treatment or have already completed treatment

Operational definitions:

Type 2 Diabetes mellitus: Two fasting or two random plasma glucose levels of more than 126mg/dl and 200 ml/dl respectively

Hepatitis C Genotype 3 (a):

Hepatitis C Virus infection confirmed on Elisa method and genotype done in the hospital laboratory.

Results

A total numbers of 200 patients, fulfilling the inclusion criteria were enrolled for study to determine the frequency of type 2 diabetes mellitus in patients with hepatitis C virus, genotype 3 (a) infection. Ninety

Table-1: Age distribution of the subjects (n=200).

Age (Years)	Frequency	Percentage
25 - 40	67	33.5%
41 - 50	93	46.5%
51- 60	40	20%
Total	200	100%
Mean and sd	43.65±3.47	

Table-2: Gender distribution of the subjects(n=200).

Gender	No. Of Patients	Percentage
Male	114	57%
Female	86	53%
Total	200	100%

Table-3: Frequency of type 2 diabetes mellitus in patients with hepatitis c virus genotype 3(a) (n=200).

Presence of Diabetes	No.of Patients	%	Male%	Female%
Yes	147	73.5%	80(54.42%)	67(45.58)
No	43	26.5%	34(64.15%)	19(35.85%)
Total	200	100%	114	86

three (46.5%) patients in our study were between the age of 41-50 years, 67 (33.5%) patients were between 25-40 years and 40 (20%) patients were between 51-60 years (**Table I**). In our study 114 (57%) patients were males and 86(43%) were females (**Table-2**). Out of these 200 patients with Hepatitis C virus, genotype 3(a) infection, type 2 diabetes mellitus was found in 147 (73.5%) patients. Out of these 147 patients having diabetes mellitus 80 (54.42%) were males and 67(45.58%) were females (**Table-3**).

Discussion

Hepatitis C virus infection is linked to many extrahepatic manifestations, which include renal, dermatological, cardiac and endocrinological. Except for vasculitic essential mixed cryoglobulinemia and membranous proliferative glomerulonephritis, other manifestation are poorly linked to HCV infection.⁹

The risk of developing T2 DM increases 2-3 times in the presence of HCV infection. The frequency of T2 DM in HCV infected patients is 19-62% as compared to 3-13% in the control group.¹⁰ There is increased incidence of T2 DM in liver and kidney transplant recipients receiving kidney and liver from HCV infected persons.¹¹ Successful interferon treatment improves control of T2 DM. Moreover, T2 DM is associated with rapid progression of liver disease and development of hepatocellular carcinoma in patients infected with HCV.¹¹

We planned this study to see the frequency of T2 DM in patients infected with HCV genotype 3(a), which is the commonest type detected in Pakistan.⁶

The prevalence recorded in our study was 73.5% (n=147) with 54.42% (n=80) males and 45.58%(n=67) females. These finding are consistent with the study conducted by Muzaffar Ali shah and colleagues¹² that showed T2 DM in 84% of patients with HCV genotype 3(a) infection.

Another study done by Amarapurkar and Co-workers,¹³ HCV genotype 3 was seen in 58% of patient suffering from T2 DM.

The data regarding frequency of T2 DM in HCV genotype 3(a) is limited especially in Pakistan. However, the results of our study may be considered a start and further studies should be conducted to determine the association of T2 DM with HCV infection.

Available data has suggested that an expression of the HCV core protein induces hepatic insulin resistance through alteration in signaling in the insulin receptor substrate-1 pathway. Insulin resistance causes hyperinsulinemia. When hyperinsulinemia reaches to

the extent of no longer compensated by the B-cells, insulin secretion declines and pancreatic beta cell failure ensues.¹⁴

Both, liver being the master of metabolism and pancreases for its dual function as endocrine and exocrine gland, play pivtol role in nutrient metabolism. So, the two diseases of study share many complications in their natural course. Therefore, indentifying T2 DM in specific genotype 3(a), which is prevalent genotype in our population, is beneficial in addressing these complications in anticipation for better quality of life. Concomitant presence of T2 DM and HCV has significant implications in clinical decision making for future treatment of the patients.

Conclusions

We concluded that frequency of T2 DM is high

among patients with Hepatitis C virus genotype 3(a). So, it recommended that every patient who present with hepatitis C virus genotype 3(a) should be screened for type 2 diabetes mellitus. Since there is high frequency of T2 DM in HCV patients, it is recommended that every setup should have their own close surveillance program to know the magnitude of the problem in that population group.

This study will form the basis of future research in multiple directions of two common diseases that share many complications of disordered nutrient metabolism that may include markers of disease identification and progress.

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