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ABSTRACT

Background: Hepatitis C virus is a blood-borne virus, and the vast majority of infections are the result of blood exposure from unsafe injection practices, poor health care, unscreened blood transfusions, injection drug use, and sexual practices that result in blood exposure. Chronic (CHC) infection is caused by the hepatitis C virus, and affected nearly 198 million people worldwide.

Objective: To determine whether there was a link between hepatitis C virus infection and Diabetes Mellitus.

Methodology: After receiving approval from the Hospital's Ethical Committee, this study was conducted over a one-year period (15-01-2018 to 16-01-2019) to investigate the relationship between HCV infection and D.M patient reports at the Diabetic Department of Diabetes and Endocrinology HMC Hospital in Peshawar. An enzyme-linked immunosorbent assay (ELISA) was used to measure anti-HCV antibody, as well as glycosylated hemoglobin (HbA1c) and fasting and random blood sugar levels. SPSS version 2.1 was used to analyses the data.

Results: average of all patients ages (n=238) was 51.3811.35 years. Patients were split evenly between males and females, with 128 (52%) males and 110 (48%) females. In the group of type 2 D.M patients who tested positive for hepatitis C by ELISA, 44 (18.8%) had diabetes and 194 (82.2%) did not.

Conclusion: Type 2 diabetes mellitus is more common Chronic Hepatitis C infection, increasing age, and a positive family history of Diabetes Mellitus according to the findings.

Keywords: *Association, type 2, Diabetes Mellitus, Chronic hepatitis C, hospital, Peshawar*

INTRODUCTION

Hepatitis C virus (HCV) is a blood-borne virus, and the majority of infectious diseases are induced by blood exposure from unsafe injection processes. The disease is the cause of chronic hepatitis C (CHC) infection, which affects approximately 250 million people. It is the most likely cause for a liver transplant in the established globe[1]. Six (6) HCV genes were described, however, it is believed that there are seven major genotypes and numerous sub-types. In Pakistan, genotypes 3a and 2a are far more common than other genotypes found elsewhere in the world[2]. According to one estimate, it affects one out of every 20 Pakistanis making it one of the most common diseases in the country[3]. According to a systematic review, 6.8% of the population in Pakistan has HCV infection, with the disease active in nearly 6% of the population. In Pakistan[4,5] contaminated syringes, contaminated barber razors, non-sterilized dental procedures, tattooing, and ear piercing are thought to have contributed to the high prevalence. Hepatocellular carcinoma, liver cirrhosis, cryoglobinemia, hypolipidemia, and metabolic syndrome, particularly diabetes mellitus (D.M), and are all possible complications. This is because HCV infection causes metabolic changes that lead to increased insulin resistance, which leads to the development of diabetes. Several studies have reported this. One found that 33% of HCV patients have diabetes, while another found that diabetes is present in 9.4% of HCV patients. Others have stated that the overall prevalence of D.M is increasing[6].

METHODOLOGY

After receiving approval from the hospital's Ethical Committee, this study was conducted for a year (15 January 2018 to 16 January 2019) to determine the association of HCV infection with D.M patients' reports at the Diabetic Department of Diabetes and Endocrinology HMC Hospital, Peshawar. Anti-HCV antibody was measured using an enzyme-linked immunosorbent assay (ELISA), as well as glycosylated haemoglobin (HbA1c), and fasting and random blood sugar levels. The collected data was analyzed using SPSS version 21. The sample size was 238 patients, selected using a methodology used in a previous study with some modifications[7]. The participants in this study were of both genders and ranged in age from 22 to 80 years old as well as those who tested positive for Hepatitis C using an ELISA test. Excluded were patients with a history of liver disease, cancer, pregnancy, or who were taking immunosuppressive drugs and have not given birth. The project also excluded those who did not give their informed consent. At the time of enrollment, all patients signed a written informed consent form.

DATA ANALAYSIS

SPSS version 21 was used to analyze the data. The mean S.D. for age (in years) was used. Sex, obesity, and people with type 2 D.M were all represented as frequency and percentages. To see the effect of modifications, the outcome variable was stratified by gender, obesity, and family history of diabetes. A post-stratification chi-square test with a significance level of 3.8 percent was used.

RESULTS

Table 1 shows the distribution of Hepatitis C Virus patients by sex, obesity, and diabetes family history. Table 2 shows how the age of 238 enrolled patients was divided into different age groups, which is based on whether they had type 2 Diabetes Mellitus are represented as mean S.D. Table 3 shows the p-value for the relationship between obesity and D.M in HCV patients. Table 4

summarizes the relationship between diabetes family history and incidence of D.M among the enrolled patients. In chronic HCV-seropositive populations in North America, Europe, the Middle East, and Asia, the prevalence of D.M (DM) ranges from 12 to 22 percent[6]. This study was conducted to determine the prevalence of type 2 D.M in C.H.C patients due to the increasing burden of HCV among diabetic patients and the lack of local data.

Table 1: Patients' general characteristics with frequency and percentage

Variables	Category	Frequency	Percentage
Gender	Males	138	57.98%
	Females	100	42.02%
Obesity	Yes	38	15.96%
	No	200	84.04%
Positive family	Yes	47	19.75%
history for diabetes	No	191	80.25%

Table 2: Frequency of patients' age groups vs whether they had Type 2 Diabetes Mellitus.

	Patient is having type 2 D.M	
Age group (years)	**Yes**	**No**
22 – 35	4 (1.76%)	24 (10.57%)
36 – 50	5 (2.20%)	82 (36.12%)
51- 65	8 (3.52%)	80 (35.24%)
> 65 - 80	5 (2.20%	19 (8.37%)
Mean ± SD	52.49 ± 12.465 years	
Range (years)	22 – 80	

P value 0.511 Statistically Insignificant

Table 3: Frequency of incidences between patients' obesity and D.M in HCV patients.

	Patient is having type 2 diabetes	
Obesity	**Yes**	**No**
Yes	6 (3.64%)	**15 (9.09%)**
No	41(9.8%)	**103 (62.42%)**
Total	**47 (28.48%)**	**118 (71.52%)**

P value 0.006**Statistically Significant

Table 4: Summary of the relationship between diabetes family history and incidence of D.M among the enrolled patients.

Positive family history for diabetes	Patient is having type 2 Diabetes	
	Yes	**No**
Yes	57 (13%)	**13 (6.2%)**
No	0 (0%)	**104 (80%)**
Total	**57 (13%)**	**121(86.2%)**

P value 0.000**Statistically Significant

DISCUSSION

This research sought determine whether diabetes and chronic HCV infection are linked among Pakistani patients. Diabetes is more common in patients with HCV-infected chronic liver disease than in those with HBV-infected chronic liver disease. Hepatitis C infection affects approximately 182 million people worldwide. According to a previous literature review, this virus still affects 5.1 percent of the Pakistani population today[4]. It's a disease that can be cured only by eradicating the virus but it requires long-term medication. The standard treatment for HCV is pegylated interferon alpha-2b, either alone or in combination with other antiviral drugs.

In this study, the average age (SD) of enrolled patients was 52.49 years as shown in table 2, which was consistent with a previous study in which the average age (SD) of enrolled HCV infected patients in the Dutch population was 51.38 years[7]. In this study, as in others before it, both males and females were recruited. Females were 100 while males were 138 as shown in table 1. This indicates that males are more likely than females to be infected with HCV in Pakistan, as well as globally[8]. The use of contaminated syringes and contaminated barber razors are the two most common causes of this disease in men.

In this study, 22 (9.69%) of type 2 D.M patients who tested positive for hepatitis C via ELISA had diabetes, while 205 (90.31%) did not. In this study, 38 patients (15.96%) were obese, while the remaining 200 (84.04%) were normal or underweight. The results of the study on diabetes C.H.C were almost identical to those of Hammers tad SS et al, who found that the overall prevalence of DM among chronic HCV patients ranges from 13-33 percent[6]. In this study, 47 of patients with a family history of type 2 D.M who tested positive for hepatitis C by ELISA had a diabetic family history, while 191 had no diabetic family history. The findings of this research into the family history of patients with type 2 D.M were stratified by age, with 4 (1.76%) in the age group of 22 to 35 years, 5(2.20%) in the age group of 36 to 50 years, 8(3.52%) in the age group of 51 to 65 years, and 5(2.20%) in the age group of above 65-80 years having an insignificant p-value (0.511)[9,10].

This study found that obese patients were 6 (3.64%) more likely than non-obese patients to have type 2 diabetes, while non-diabetic patients were 15 (9.09%) more likely to be obese. The study also showed that 118 (71.52%) were normal or underweight with a significant p-value (0.006)[11,12].

CONCLUSION

This research found a link between diabetes and chronic HCV infection. Diabetes is more common in patients with HCV-infected chronic liver disease than in those with HBV-infected chronic liver disease. Type 2 D.M occurs frequently in patients with chronic Hepatitis C infection, increasing age, and a positive family history of type-2 diabetes, according to our findings.

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