Frequency Of Hepatitis C Infection in Diabetes Mellitus

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Place and duration of study: The study was conducted at diabetic clinic B.V. Hospital/Q.A.M.C Bahawalpur from December1st, 2004 to March 15th, 2005. **Background**: Diabetes mellitus and hepatitis C infections are common and emerging problems of the society. Either diabetes mellitus is common in chronic hepatitis C patients as reported initially by Ellison and co-workers or hepatitis C infection is more frequent in diabetes mellitus. We want to study the frequency of hepatitis c infection in diabetes mellitus. **Objectives:** To study the frequency of hepatitis C infection in diabetic patients and to note any risk factors of diabetic patients predisposing to hepatitis C infection. **Designs:** A cross-sectional-Observational-descriptive analytic study. **Subjects and Methods:** A total of 250 consecutive diabetic patients of either sex were compared with 6574 blood donors for hepatitis c infection .They were evaluated for hepatitis C infection by using Enzyme Linked Immunosorbant Assay (ELISA-3) which is an anti-HCV antibody test. On basis of this test, the patients were divided into two groups, anti-HCV +ve and anti-HCV -ve. Different variables of these patients were studied and compared in these two groups Variables studied were as follows:- Age, Sex, BMI, Mode of therapy area of their residence(rural or urban) Duration of diabetes mellitus, Blood pressure, Nephropathy and Control of diabetes mellitus. **Results:** Among a total of 250 patients, 120 (48%) were male and 130 (52%) were female. Two hundred and forty-four (97.6%) patients were of type-II DM and 06 (2.4%) patients were of type-I DM. 22 (8.8%) patients were on insulin therapy while 228 (91.2%) were on oral hypoglycemic agents. Anti-HCV test was positive in 69 (27.6%) diabetic patients as compared to blood donors 41(0.62%). In anti-HCV positive group, longer duration of diabetic mellitus (<one yr 20.28%,1-15 yrs 63.76%,>15yrs 15.94%), poor control of diabetic mellitus(87%), insulin therapy(17.39%) hypertension(91.3%) and nephropathy(94.2%) were the significant variables while BMI, age, sex and whether they were belonging to either rural or urban area were not significant in both the groups. **Conclusion:** Hepatitis C infection is common in diabetic patients as compared to control group (27.6% vs 0.62%). Out of diabetic patients HCV infection is more common with longer duration of diabetic mellitus, poor control of diabetic mellitus, hypertension, nephropathy and insulin therapy.
Key Words: Anti-HCV. Diabetes Mellitus. Hepatitis C Infection. Nephropathy.

Hepatitis C infection has been recognized a major public health problem all over the world[1]. Worldwide prevalence is 3%, while the prevalence in Pakistan is 4-7%[2]. Hepatitis C infection is asymptomatic not only in chronic but also in acute stage[3]. It leads to chronic liver disease in 60% and leading to liver cirrhosis in 10-20 years[4] And hepatocellular carcinoma is an important complication of liver cirrhosis developing at the rate of 1-4% per year[5,6]. On the other hand, diabetes mellitus is also a major public health problem. Worldwide prevalence of diabetes is 4%, while in Pakistan prevalence of diabetes is 4.5-11% making Pakistan 6th in world ranking of diabetes mellitus prevalence[7,8]. The spectrum of liver disease in type-II diabetes ranges from nonalcoholic fatty liver disease to cirrhosis and hepatocellular carcinoma and liver disease is one of the leading causes of death in persons with type-II diabetes[9]. Nonalcoholic fatty liver disease is now considered part of the metabolic syndrome, and, with alcohol and hepatitis C, is the most common cause of chronic liver disease in the United States[9,10,11,12]. When two diseases are common in the community then chances of association are very high, many studies are in favour of association between diabetes mellitus and hepatitis C infection[13,14], Either diabetes mellitus is common in chronic hepatitis C patients or hepatitis C infection is more frequent in diabetes mellitus this controversy is still going on[15,16]. We have conducted a study to see frequency of hepatitis C infection in diabetes mellitus and to note any risk factor of diabetic patients predisposing to hepatitis C infection

Place and duration of study:
The study was conducted at diabetic clinic B.V. Hospital/Q.A.M.C Bahawalpur from December 1st, 2004 to March 15th, 2005.

Objectives:
To study the frequency of hepatitis C infection in diabetic patients and to note any risk factors of diabetic patients predisposing to hepatitis C infection.

Designs:
A cross-sectional-Observational descriptive study.

Subjects and Methods:
Two hundred and fifty known diabetic patients of either sex were evaluated for hepatitis C infection by hepatitis C Virus One Step Test Device This screening test was chromatographic immunoassay for the qualitative detection anti-HCV antibody in serum or plasma (relative sensitivity:96.8%, relative specificity: 99%,Accuracy:98.9%) Anti-HCV positive patients by this screening test were subjected to enzyme linked immunosorbant assay (ELISA-3) for confirmation, This test (ELISA-3) was performed with AXSYM HCV version 3.0 which was based on Micropartical Enzyme Immunoassay (MEIA) technology (relative sensitivity:

100%, relative specificity:99.8%). On basis of this test, the patients were divided into two groups, anti-HCV positive and anti-HCV negative. Different variables of these patients were studied and these two groups were compared for statistical significance. Chi-Square was applied to the asses the statistical significance and P value > 0.05 was considered as significant. Variables studied were as follows:- Age, Sex, BMI (normal < 25, overweight > 25), Rural / urban residents, Mode of therapy (oral therapy or insulin injection),duration of diabetes mellitus, Blood pressure (normotensive < 140 / 80 mmHg, hypertensive > 140/80 mmHg), Nephropathy (micro-albuminuria / macroalbuminuria), Control of diabetes mellitus(FBS < 7.8 mmol/l –optimal control, & FBS >7.8 mmol/l – poor control).

Results:

Among a total of 250 patients, 120 (48%) were male and 130 (52%) were female. Two hundred and forty-four (97.6%) patients were of type-II DM and 06 (2.4%) patients were of type-I DM table no.1. Twenty-two (8.8%) patients were on insulin therapy while 228 (91.2%) were on oral hypoglycemic agents.

Anti-HCV test is positive in 69 (27.6%) patients. The age distribution is from 22 to 100 years. The most of the patients are in age group > 50 years as shown in table no.2. There are 39 (56.5%) male and 30 (43.5%) female, thirty seven patients (53.62%) were either overweight, and majority of the patients are belonging to urban area. Duration of diabetes mellitus was < 1 year in 14 (20.28%) patients, 1-15 years in 44 (63.76%) patients and > 15 years in 11 (15.94%) patients, uncontrolled DM in 60 (87%) patients, nephropathy in 65 (94.20%), systemic hypertension in 63 (91.30%) patients and 12 (17.39%) patients were on insulin therapy.,

Comparison of patients with anti-HCV +ve and anti-HCV –ve group revealed that maximum no of patients in each group is in > 50 years as shown in table no.1, statistically insignificant difference are noted in each group. Male are comparatively more in anti-HCV +ve group but insignificant statistically. Similarly overweight patients are more common in anti-HCV +ve but again it is statistically insignificant. Similarity rural / urban background is also insignificant. Frequency of anti-HCV +ve patients is more with longer duration of diabetes mellitus which is statistically significant ($P < 0.5$). Control of diabetes mellitus is an important factor as Anti-HCV +ve patients are with poor control ($p < .001$). Insulin therapy is also significant statistically in anti-HCV +ve group ($P < .005$). Nephropathy and hypertension are also more common in anti-HCV +ve group ($P < .01$ in both).

Discussion:

In our study frequency of hepatitis C infection was 27.6% in diabetes mellitus (both type-I and type-II), which was very high as compared to the general population prevalence of hepatitis C infection[2]. Initially Ellison and co-workers reported that diabetes is more common in hepatitis C infection and the subsequent studies conducted worldwide, also supported this initial report[16,17,18,19,20]. While Simo Rafael pointed out first time that hepatitis C infection is more frequent in diabetes mellitus, which was again supported by various American and European studies[21] . If we compare our study with other studies then it shows similarity[22,23]. A very important data was analyzed from UKPDS trial which showed that hepatitis C was more prevalent in white Caucasian and Asian patients residing in Europe where prevalence is under 1%[24]. Hyperglycemia in people with chronic liver disease (hepatitis C) was attributed not only to insulin resistance but also to decreased insulin production[25,26]. But why hepatitis C infection is common in diabetes mellitus is still unknown.

Among many variables studied in our study, duration of diabetes, poor control of diabetes, insulin injection therapy, nephropathy, hypertension were significantly related with association with hepatitis C infection& diabetes mellitus longer.

Duration of diabetes mellitus was significantly related with hepatitis C infection may be due to the reason that these people are having decrease immunity and increased number of surgical interventions.

Uncontrolled diabetes mellitus was very significantly related with hepatitis C infection . Poorly controlled diabetes may predispose to hepatitis C infection and it is possible that HCV infection may serve as an additional risk factor for the development of diabetes, beyond that attributable to chronic liver disease alone[27,28]. Poor control of diabetes mellitus. Reasons may be due to insulin resistance, fibrosis of pancreas and fibrosis in liver[29,30,31].

There is significant relation between insulin and hepatitis C infection suggesting sharing of needles among diabetics. Hypertension and nephropathy are also significantly related with hepatitis C infection. Either diabetic type-II nephropathy is having high frequency of hepatitis C infection or hypertension is caused by hepatitis C induced glomerulonephritis[32,33,34].

Conclusion:

Hepatitis C infection is common in diabetic patients as compared to general population. Out of diabetic patients HCV infection is more common with longer duration of diabetic mellitus, poor control of diabetic mellitus, hypertension, nephropathy and insulin therapy

Table 1

Total patients	250
Male	120 (48%)
Female	130 (52%)
Type-I DM	06 (2.4%)
Type-II DM	244 (97.6%)

Table .2

Age	HCV +ve	HCV –ve
<30 years	06 (08.6%)	04 (02.20%)
30-39 years	14 (20.28%)	20 (11.04%)
40-49 years	15 (21.73%)	53 (29.28%)
>50 years	34 (49.27%)	104 (58.98%
BMI		
<24.9	32 (46.37%)	68 (37.56%)
>25	37 (53.62%)	113 (62.43%)
Sex		
Male	39 (56.5%)	81 (45%)
Female	30 (43.5%)	100 (55%)
Area		
Rural	22 (31.88%)	64 (35.35%)
Urban	47 (68.12%)	117 (64.64%)

P value not significant

Table 3

Duration of DM	HCV +ve	HCV –ve	P –Value
<one year	14 (20.28%)	80 (44.19%)	<0.05
1-15 years	44 (63.76%)	81 (44.75%)	
>15 years	11 (15.94%)	20 (11.04%)	
Uncontrolled DM	60 (87%)	75 (41.43%)	<0.001
Injection Insulin Therapy	12 (17.39%)	10 (5.52%)	<0.005
Nephropathy	65 (94.20%)	146 (80.66)	<0.01
Hypertension	63 (91.30%)	137 (75.69%)	<0.01

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