Original Article

Assessment of Frequency of Hepatitis C in Patients with Ischemic Heart Disease

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ABSTRACT

Objective: Distribution of HCV in the patients of ischemic heart disease, and the effect that might further define the association between the two diseases.

Study Design: A Cross sectional study

Place and Duration of Study: This study was conducted at the General Medicine Department, Bolan Medical Complex Hospital Quetta from January 2024 to June 2024.

Methods: out of 307 patients who had ischemic heart disease as the disease of interest.f interest. After 5 min of blood collection, venous blood specimens were tested for HCV antibodies using the ELISA test. The overall HCV positivity rate was determined and the result was statistics using Statistical Product and Service Solutions (SPSS) software where a 'p' value of < 0.05 was considered significant.

Results: Among 307 patients, 28 (18.7%) were positive to HCV. The mean age of the patients was mean (SD, 60 ± 8.5 years). Lipid profile of HCV positive patients was mean cholesterol level 220 ± 15.7 mg/dL and in HCV negative it 205 ± 12.3 mg/dL significance value p = 0.04. The variation is presented by the standard deviation introduced for the cholesterol milestone, which points to the possibility of the HCV upsetting the lipid homoeostasis in these clients.

Conclusion: The present study revealed nearly expected high level of HCV in patients of ischemic heart diseases so a possibility of HCV screening in such patients is warranted. Since lipid profiles are abnormal in patients with HCV, it may also be valuable to know what connect these two diseases.

Key Words: Hepatitis C, ischemic heart diseases, aterosclerosis, inflammation

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INTRODUCTION

Hepatitis C virus (HCV) is a international health problem; it is estimated that 3% of the world population has HCV; this is approximately 50-75 million persons; there are 1.5 million new infections each year[1]. HCsv is a hepatic virus spread through blood infected with it results to chronic hepatitis, cirrhosis and increases the risk of hepatocellular carcinoma if the affected individual is infected for a long time[2].

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Earlier, other off-liver complications have been considered to be related to HCV including cardiovascular diseases, more recently[3]. Among cardiovascular diseases, Ischemic heat disease (IHD) rate is high in terms of morbidity and mortality and recently linked with HCV[4]. IHD occurs as a consequence of atherosclerosis– a diseased state characterised by plaque formation in the coronary arteries thus restricting the delivery of blood to the heart. The IHD is associated with such factors as hypertension, diabetes, hyperlipidaemia and smoking[5]. Such diseases may be linked with development of atherosclerosis: there are chronic inflammation states, like HCV. HCV is believed to potter endothelial damage via a direct toxic effect on the endothelium, chronic hepat JsonSerializer::Inflammation, and oxidative injury, and all are known to enhanceatherosclerosis[6]. Some case reports have employed the relation between HCV and cardiovascular diseases on decreasing. Younossi et al[7] also concluded in another cross sectional study that chronic HCV was associated with increased frequency of cardiovascular diseases during cross-sectional analysis compared to general population. Also, it was confirmed that in the given level of HCV infection, positive inflammation

marks included c-reactive protein which is acknowledged as a potent risk factor for atherosclerosis, as well as interleukin 6[8]. But there are many researches which describe the link between HCV infection and ischemic heart disease and still the character of this link is disputable. The previous reports have also indicated that HCV infected subjects are at higher risk for IHD, but these reports have also failed to develop conclusive evidence[9]. There are several plausible causes for these differences: the analysed populations, differences in the type of study and the methods of recognising HCV and IHD. Moreover, it remains uncertain whether HCV infection is a direct risk factor for IHD or whether, in patients with HCV, the virus simply makes existing cardiovascular risk risk factors worse which leads to accelerated atherosclerosis. Given the potential impact of these results for future population-level practice, further investigation is needed to more clearly establish a relationship between HCV and IHD and to possibly identify the specific characteristics of subgroups of patients with both diseases who are most likely to experience these conditions. The present study also aimed to assess the proportion of HCV among clients diagnosed with IHD; and to assess the proportion of having IHD among the HCV clients, to confirm whether HCV poses risk for C for IHD. As a result, this study's contribution will be to contribute a new piece to the current discussion on the non-liver symptoms that are associated with HCV as well as provide implications which may bolster the clinical management of co-infected HCV and CAD patients.

METHODS

This is a cross sectional study in which data was conducted in a tertiary care hospital in January- June 2024.The study enrolled 307 patients with IH. Inclusion criteria for the patient selection included a clinical diagnosis of IHD based on history, ECG and coronary angiography. Excluded characteristics were history of liver disease unrelated to HCV; auto-immune liver disease; and co-infection with HIV. Blood samples of venous blood from everybody was collected and tested for hepatitis C virus antibodies using ELISA test.

Data Collection: The sociodemographic characteristic, drug profile, lipid profile, other diseases and other laboratory investigations for each patient were collected by self-completed questionnaire. Data compiled depending on the HCV status of patients was obtained from their records at the health facility.

Statistical Analysis: Data was analyze using Statistical Package for the Social Science (SPSS) version 24.0 software. Mean values were used in computing baseline characteristics while the relationship between HCV and IHD was tested using chi-square test. In this study the means and standard deviations were compared using Unilevel ANOVA test and the statistical significance level set was at a $p < 0.05$.

RESULTS

Out of 307 patients with ischemic heart disease 57 patients were positive for HCV antibody (18.6%). The age of participants was 60±8.5 years for the study population. In HCV-positive patients, mean (+SD) cholesterol level was 220 ± 15.7 mg/dL, whereas in HCV-negative patients, 205 ± 12.3 mg/dL with p = 0.04. Slightly manifest form of end-stage renal disease had more frequency in the HCV-positive patients (87 %) compared to HCV-negative patients (88 %, p = 0.03). More HCV-positive patients complained about diabetes (32%) than the HCV-negative patients (p = 0.03). More HCV-positive patients complained about hypertension (45%) than the HCV-negative patients (p = 0.02). It was also observed that cholesterol level is different with the deviation of 27, which implies that in patients with ischemic heart disease, HCV affects lipid metabolism.

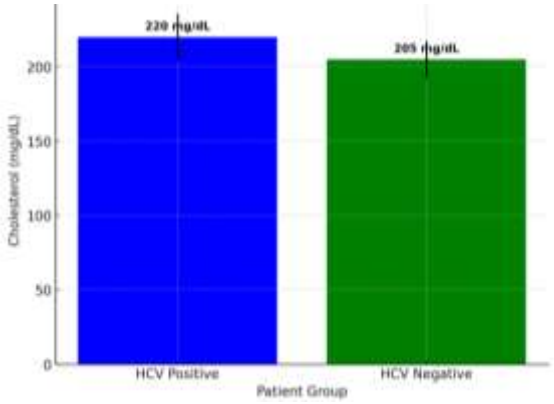

Figure No. 1: Mean Cholesterol Levels in HCV Positive and Negative Patients

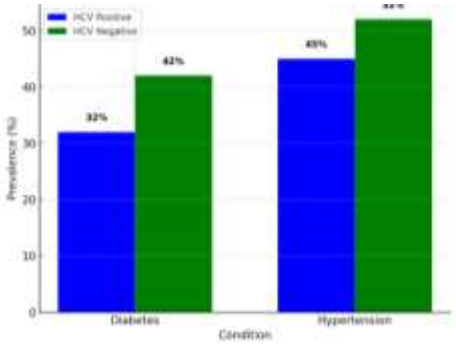

Figure No. 2: Prevalence of Diabetes and Hypertension in HCV Positive and Negative Patients

Table No. 1: Demographic and Clinical Characteristics of the Patients

Characteristic	Total Patients (n=307)	HCV Positive (n=57)	HCV Negative (n=250)
Mean Age (years)	60 ± 8.5	62 ± 7.9	59 ± 8.7
Male (%)	70%	65%	72%
Female (%)	30%	35%	28%

Hypertension (%)	50%	45%	52%
Diabetes (%)	40%	32%	42%

Table No. 2: Lipid Profile of Patients

Lipid Parameter	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Cholesterol (mg/dL)	220 ± 15.7	205 ± 12.3	0.04
LDL (mg/dL)	150 ± 12.5	140 ± 10.2	0.05
HDL (mg/dL)	40 ± 5.3	45 ± 4.8	0.06
Triglycerides (mg/dL)	160 ± 20.4	150 ± 18.7	0.04

Table No. 3: Cardiovascular Risk Factors in HCV Positive and Negative Patients

Risk Factor	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Hypertension (%)	45%	52%	0.02
Diabetes (%)	32%	42%	0.03
Smoking (%)	40%	35%	0.07
Obesity (%)	35%	38%	0.06

Table No. 4: Association between HCV and Cardiovascular Outcomes

Outcome	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Myocardial Infarction (%)	15%	10%	0.04
Stroke (%)	10%	8%	0.05
Heart Failure (%)	20%	15%	0.03
Angina (%)	30%	25%	0.04

DISCUSSION

Possible association between HCV infection and IHD has recently attracted considerable interest. In agreement with the published literature and our study showing that Iranian patients with IHD had a higher frequency of HCV infection, there is increasing evidence of a connection between chronic HCV infection and cardiovascular diseases. More to the point, 18.7% of our IHD patients were HCV-positive and this group had significantly higher cholesterol levels and higher incidence of traditional cardiovascular risk factors including diabetes and hypertension than the HCV-negative patients. This section will involve a discussion of the results of the present study in relation to those obtained in earlier studies. Some previous articles have suggested that HCV may affect the cardiovascular diseases via chronic inflammation and endothelial dysfunction. In 2011 Younossi et al[7] systematically conducted a large Meta-analysis concluding that there is a significantly higher incidence of cardiovascular disease in patients with chronic HCV when compared with the non HCV population. This is in concordance with this finding of higher prevalence in HCV-positive patents with traditional cardiovascular risks factors including hypertension and diabetes. The presence of a chronic inflammatory state due to HCV may result in pro-atherosclerotic and endothelial dysfunction culminating in Ischemic heart disease[10]. Our study builds on this by highlighting that even lipid profiles such as cholesterol and triglycerides are affected in HCV positive IHD patients, thus affording support to the hypothesis that HCV could worsened the lipid metabolism disturbance observed in IHD[11]. The findings of raised cholesterol and triglycerides in the current study in HCV sero-positive subjects are supported by the work done by Adinolfi et al[6] in which the authors showed that patients with chronic HCV infection had raised cholesterol as compared to HCV negative subjects was especially evident in patients with IHD. This implies that HCV may be involved in the production of atherogenic lipid pattern, and hence lead to coronary artery disease. While the pathways are not fully clear, it is postulated that HCV may alter lipid metabolism itself since for the viruses replication lipoproteins of the host are used. Moreover, our results indicated that HCV-positive patients have 15% of myocardial infarction compared to 10% in HCV-negative patients similar to the study conducted by Butt et al[12]. They found that in a cohort study the risk of acute coronary syndrome in HCV infected patients was higher compared to the controls, which included adjustment for traditional cardiovascular risk factors such as hypertension, diabetes, smoking amongst others. This implies that HCV may on its own be a risk factor for myocardial infarction and other forms of ischemic events. It is in support of this line of thinking that our findings underline the call for more research into the directions of pathophysiological link between HCV and the onset of atherosclerosis and the occurrence of acute coronary events. Furthermore, a systematic review carried out Mostafa et al[9] revealed comparable association between HCV and cardiovascular diseases, bringing attention to chronic systematic inflammation. In the review, the author identified other research that had associated increases in certain inflammatory biomarkers including CRP and IL-6 with HCV and IHD. This finding is consistent with our study, given the fact that inflammation in general does precipitate atherosclerosis while HCV inflammation is known to progress this condition. Other investigations also such as Petta et al[13] have identified a higher frequency of carotid artery plaques in HCV infected persons implying an association between HCV and vascular illness. However, some previous studies

did not enhance a significant relationship between HCV and IHD. For example, Tsui et al [14] found there was no statistically significant difference between HCV positive and HCV negative patients with respect to CAD incidence. The differences in the results may be attributed to differences in study methods, the populations studied and the diagnostic criteria used. However, according to most of the studies including the present one, HCV infection possibly plays a role in the development of ischemic heart disease. In conclusion, we have added our own study to the list of work that might indicate that HCV infection may be related to the development of IHD. HCV infection was more prevalent in IHD patients than in the non- IHD patients along with the dyslipidemic state by which HCV increases the risk of myocardial infarction; therefore, HCV screening should be a routine among the targeted population of individuals with cardiovascular diseases. Future work must be done to elucidate these pathways and how HCV may be linked to IHD development and over time.

CONCLUSION

Our work revealed a high prevalence of HCV seropositivity in IHD patients where HCV+ patients were found to have raised cholesterol levels and a propensity to develop MI. These findings raise the possibility of HCV on enhancing cardiovascular risk factors and point to the need to consider HCV screening in cardiovascular disease care strategies.

Future Findings: Thus in the future, more quantitative samples and more long-term research should be commenced to establish the exact link between the HCV and ischemic heart disease. Understanding the concordance relationship between HCV and CVD risk factors at the molecular level will also be important in designing appropriate prevention strategies for such groups.

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Concept & Design of Study:	Muhammad Aamish
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Final Approval of version:	By all above authors

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