Original Article

Frequency of Coronary Artery Disease in Chronic Hepatitis C Infected Non Cirrhotic Patients

Coronary Artery Disease in Chronic Hepatitis C

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ABSTRACT

Objective: To determine the prevalence of coronary artery disease in individuals with chronic hepatitis C infection who are not cirrhotic.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Gastroenterology, Lahore General Hospital, Lahore from 29-5-2019 to 29-11-2019.

Methods: A total of 150 individuals who fulfilled the study's inclusion criteria were recruited. Participant demographics and permission forms were collected. The individuals were then tested for CAD symptoms. CAD was diagnosed based on the results of an exercise tolerance test and the clinical criteria. Data was analyzed using SPSS ver. 21.

Results: In this study, the mean age of individuals was 42.54±4.76 years; male to female ratio of 1.03:1. The history of smoking was found in 54(36%) individuals. Out of 150 hepatitis C individuals, the CAD was found in 82(54.67%) individuals.

Conclusion: According to this study, the frequency of CAD is 54.67% in chronic HCV infected non cirrhotic individuals.

Key Words: Chronic Hepatitis C, Coronary Artery Disease, Non-Cirrhotic, Hepatitis-C, diagnose

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INTRODUCTION

Worldwide, cardiovascular illnesses are among the leading causes of death and disability. Since the previous several decades, high-income nations have seen fewer fatalities from cardiovascular disease, while low- and middle-income countries have borne an increasing share of the burden.[1] More than a quarter of the world's population lives in a country with a low or middling income, and people in South Asian nations like Pakistan, Sri Lanka, Bangladesh, India, and Nepal have a greater risk of developing coronary heart disease than those in other parts of the world.[2]

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Coronary artery disease (CAD) is more common among South Asian individuals than in Chinese or Canadian individuals, according to a large population-based cohort research.[3]

Chronic hepatitis C is known to increase the risk of atherosclerosis and heart disease by contributing to insulin resistance and metabolic syndrome. Consequently, it may be assumed that the elevated risk of metabolic syndrome associated with chronic hepatitis C also applies to the risk of myocardial infarction.[4] It has been reported that the risk of CAD was OR: 1.382 (95% CI: 1.103, 1.732) is significantly associated with hepatitis C.[5] In a meta-analysis by a researcher found that in HCV-infected individuals 48.2% had CAD.[6] While another study reported prevalence of CAD in 69.8% individuals of HCV individuals.[7]

The purpose of this research is to determine the prevalence of CAD in people who have chronic hepatitis C. There is conflicting evidence in the medical literature about how often coronary artery disease (CAD) occurs in individuals with chronic Hepatitis C infection, and the literature that does exist tends to be either out of date or poorly done. However, there is a dearth of available data about the incidence of CAD in individuals with chronic hepatitis C. As a consequence, we propose this research to collect new information that may be used to improve future care protocols and to

begin screening for CAD in individuals with chronic hepatitis C.

METHODS

Study Design: It was cross sectional study was done at Department of Gastroenterology, Lahore general Hospital, Lahore during the time period from 29-5-2019 to 29-11-2019.

Sample Size: In this study the sample size was calculated as 150 cases. The calculation was done by keeping 95% confidence level, 5% margin of error with prevalence of CAD i.e. 48.2% in individuals with hepatitis C.[1] the sample calculation was method was used by following non-probability and consecutive methodology.

Selection of patients: Inclusion: Individuals of age 35-50 years from both genders (male and female), diagnosed with chronic hepatitis-C infection as per operational definition and are non-cirrhotic i.e. with Child-Turcotte-Pugh class A were enrolled in the study. Hepatitis-C infection was defined as presence of HCV RNA >10-cells in blood (positive serology) on ELISA method diagnosed at least from 6 months.

Exclusion: Individuals with Hepatitis-C related compensated or decompensated liver disease (Child-Pugh class B or C), CAD before diagnosis of hepatitis-C and already taking treatment, treated for Hepatitis C and achieved sustained viral response were excluded from the study.

Data Collection Procedure: 150 individuals meeting the inclusion and exclusion criteria were included in the study from outpatient department (OPD). Informed consent was obtained and demographics like name, age, gender, duration of hepatitis-C were recorded. Then individuals were evaluated for symptoms of coronary artery disease (CAD) i.e. chest pain on exertion relieving on rest or dyspnea on exertion with +/- electrocardiography changes (ST depressions, T wave inversions). (ST depressions, T wave inversions) are abnormal electrocardiogram (ECG) findings that indicate possible cardiac ischemia or injury. ST depressions refer to a downward displacement of the ST segment on an ECG, suggesting myocardial ischemia or reduced blood flow to the heart muscle. T wave inversions refer to an abnormal inversion of the T wave, which can also indicate myocardial ischemia, myocardial injury, or other cardiac abnormalities. These ECG changes are important markers of cardiac health and may warrant further evaluation and treatment by a healthcare professional.

CAD was labeled if patient have symptoms like chest pain on exertion (relives on rest) dyspnea on exertion, and positive exercise tolerance test (i.e. electrocardiography findings of ST segment depression or elevation of >1mm OR exercise induced hypotension OR exercise induced angina). All of the information was stored on custom-made Performa.

Data Analysis: IBM-SPSS version 21 was used to enter and analyses the data. For quantitative factors like age and Hepatitis C incubation period, the mean and standard deviation were reported. Qualitative characteristics such as sex and CAD presence were converted to frequency and percentage.

RESULTS

In this study, 76(50.67%) individuals were male while 74(49.33%) individuals were females with male-to-female ratio of 1.03:1. According to our study results, the history of smoking was observed in 54(36%) individuals. Out of 150 individuals the symptoms of the disease were found in 67(44.7%) individuals. According to our study results, the exercise tolerance test (ETT) positive findings were present in 83(55.3%) individuals. Out of 150 hepatitis C individuals, the CAD was found in 82(54.67%) individuals. The values are shown in Table 1.

In individuals with age ≤ 45 years the CAD was observed in 60 (51.3%) individuals while among individuals with age >45 years the CAD was observed in 22 (66.7%) individuals. Age had insignificant impact on occurrence of CAD in Hepatitis C individuals (p-value = 0.117). In male individuals, the CAD was observed in 43 (56.6%) individuals while among female individuals the CAD was observed in 39 (52.7%) individuals. Gender had no relationship with occurrence of CAD in Hepatitis C individuals (p-value = 0.634). In underweight individuals, the CAD was found in 5 (50%) individuals, among normal BMI individuals the CAD found in 46 (51.7%) individuals while among overweight & obese individuals the CAD was found in 31 (60.8%) individuals. BMI had no significant impact on occurrence of CAD in Hepatitis C individuals (p-value = 0.309).

Table No.1: Basic demographics information of enrolled individuals (n = 150)

Values		**Frequency**	**Percent**
Gender	Male	76	50.67
	Female	74	49.33
Smoking	Yes	54	36
	No	96	64
Symptoms	Present	67	44.7
	Absent	83	55.3
ETT	Present	83	55.3
	Absent	67	44.7
CAD among hepatitis C individuals	Present	82	54.67
	Absent	68	45.33

In individuals with history of smoking, the CAD was found in 31 (57.4%) individuals whereas among individuals without history of smoking the CAD was found in 51 (53.1%) individuals. Smoking also showed insignificant relationship with CAD in hepatitis C

individuals (p-value = 613). In CAD individuals, the presence of symptoms was found in 49 (73.1%) individuals while absence of symptoms was found in 33 (39.8%) individuals. This difference was observed as significant (p-value < 0.001). The numerical value are shown in Table 2.

Table No.2: Comparison of CAD in different groups

Values		CAD		p-value
		Present	Absent	
Age (Years)	≤ 45	60	57	0.117
		51.3%	48.7%	
	>45	22	11	
		66.7%	33.3%	
Gender	Male	43	33	0.634
		56.6%	43.4%	
	Female	39	35	
		52.7%	47.3%	
BMI	Under-weight	5	5	0.309
		50.0%	50.0%	
	Normal	46	43	
		51.7%	48.3%	
	Over-weight & obese	31	20	
		60.8%	39.2%	
Smoking	Yes	31	23	0.613
		57.4%	42.6%	
	No	51	45	
		53.1%	46.9%	
Symptoms	Present	49	18	<0.001
		73.1%	26.9%	
	Absent	33	50	
		39.8%	60.2%	

DISCUSSION

Hepatitis C virus (HCV) infection is widespread (2.5% prevalence globally), resulting in chronic liver damage in 170 million persons. Multifactorial in origin, atherosclerosis is the leading cause of coronary artery disease (CAD), which is the most prevalent type of heart disease. Despite medical advances, CAD remains the leading cause of mortality, as well as a significant contributor to disability and diminished quality of life. The economic burden of CAD is substantial, making it a major public health concern.[5]

Only 82 (54.67%) of the 150 hepatitis C individuals in this research had CAD. Below, we describe the findings of a few of these investigations.[8] The incidence and severity of CAD were shown to be significantly greater in HCV-infected individuals, according to a case control study. In other study, HCV-infected individuals had a higher prevalence of CAD (69.8% vs. 47.6%, p = 0.01), a higher modified Reardon's severity score (6.26 5.39 vs. 2.6 3.03, p 0.0005), and a higher prevalence of severe multivessel CAD (defined as >50% stenosis in 2 vessels involved; 57.1% vs. They found that almost half (48.1%) of those with HCV also suffered from CAD.[9-10]

Individuals with HCV infection are at an increased risk of CAD, as shown by researcher that due to the low quality of the bulk of published research on this subject, definitive findings are elusive.[11] According to another research, 69.8 percent of those with HCV also had CAD.[7] Hepatitis C has been linked to an increased risk of coronary artery disease, with an odds ratio (OR) of 1.382 (95% CI) of 1.103 to 1.732.[12]

In an other study, US veterans for 5 years, completed the biggest epidemiological research to date (including 82 083 HCV-infected and 89 582 HCV-uninfected individuals). While HCV-infected individuals tended to be younger and have a healthier cardiometabolic risk profile, the data indicated that they were also much more likely to suffer from cardiac illnesses such as myocardial infarction, congestive heart failure, and the need for coronary artery bypass grafting or coronary angioplasty.[13]

In also other study, which included 139 individuals who tested positive for HCV and 225 individuals who tested negative for HCV; they found that HCV infection was an independent predictor of greater coronary atherosclerosis, as evidenced by a higher Reardon severity score.[14] In a random effects model, an other researcher found that the overall RR of HCV infection for CAD was 1.25 (95% CI: 1.12-1.40). The pooled odds ratio (OR) for HCV infection and CAD was 1.94 (95% CI, 1.56-2.38), based on analyses of case-control and cross-sectional studies. This meta-analysis did not detect any publication bias. Infection with HCV was shown to increase the likelihood of developing CAD in this meta-analysis.[15]

According to the findings of the study conducted by an other author, the prevalence of HCV antibody positive individuals referred for coronary angiography was approximately 30.3%, and CAD individuals who are HCV antibody positive had more severe coronary lesions and less prevalence of diabetes and hypertension than HCV antibody negative individuals. It will be important for future research to validate this finding and to assess the strength of the correlation between the two variables. Careful management of confounders and accurate reporting should be at the forefront of future studies.[16-17]

CONCLUSION

According to this study the frequency of CAD is 54.67% in patient with chronic hepatitis C infected non cirrhotic individuals. The findings underscore the portent of heightened vigilance and potential early screening for cardiovascular risk factors in the patients.

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Author's Contribution:

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REFERENCES

1. Barolia R, Sayani AH. Risk factors of cardiovascular disease and its recommendations in Pakistani context. JPMA J Pak Med Assoc 2017; 67(11):1723.
2. Lee KK, Stelzle D, Bing R, Anwar M, Strachan F, Bashir S, et al. Global burden of atherosclerotic cardiovascular disease in people with hepatitis C virus infection: a systematic review, meta-analysis, and modelling study. lancet Gastroenterol Hepatol 2019;4(10):794-804.
3. Babiker A, Hassan M, Muhammed S, Taylor G, Poonia B, Shah A, Bagchi S. Inflammatory and cardiovascular diseases biomarkers in chronic hepatitis C virus infection: A review. Clin Cardiol 2020;43(3):222-34.
4. Li X, Wang L, Gao P. Chronic hepatitis C virus infection: Relationships between inflammatory marker levels and compensated liver cirrhosis. Med 2019;98(39):e17300.
5. Babiker A, Jeudy J, Kligerman S, Khambaty M, Shah A, Bagchi S. Risk of cardiovascular disease due to chronic hepatitis C infection: a review. J Clin Translational hepatol 2017;5(4):343.
6. Domont F, Cacoub P. Chronic hepatitis C virus infection, a new cardiovascular risk factor? Liver Int 2016;36(5):621-7.
7. Stockman LJ, Greer J, Holzmacher R, Dittmann B, Hoftiezer SA, Alsum LE, et al. Performance of risk-based and birth-cohort strategies for identifying hepatitis C virus infection among people entering prison, Wisconsin, 2014. Public Health Reports 2016;131(4):544-51.
8. Wu VC, Chen TH, Wu M, Cheng CW, Chen SW, Chang CW, et al. Comparison of cardiovascular outcomes and all-cause mortality in patients with chronic hepatitis B and C: a 13-year nationwide population-based study in Asia. Atherosclerosis 2018;269:178-84.
9. Randhawa VK, Grunau BE, Debicki DB, Zhou J, Hegazy AF, McPherson T, et al. Cardiac intensive care unit management of patients after cardiac arrest: now the real work begins. Canadian J Cardiol 2018;34(2):156-67.
10. Aliberti S, Rosti VD, Travierso C, Brambilla AM, Piffer F, Petrelli G, et al. A real life evaluation of non-invasive ventilation in acute cardiogenic pulmonary edema: a multicenter, perspective, observational study for the ACPE SIMEU study group. BMC Emerg Med 2018;18:1-5.
11. de Waha S, Eitel I, Desch S, Fuernau G, Pöss J, Schuler G, et al. Impact of multivessel coronary artery disease on reperfusion success in patients with ST-elevation myocardial infarction: A substudy of the AIDA STEMI trial. Eur Heart J : Acute Cardiovascular Care 2017;6(7):592-600.
12. Mastoor K. Effects of Interferon Alpha on Thyroid Functions During Treatment of Chronic Hepatitis C. Med Forum 2015;26(5):9-12.
13. Farooq HA, Dogar AS, Ijaz S. Hepcidin as a Marker of Anemia in Chronic Hepatitis C Infections. Med Forum 2019;30(9):92-96.
14. Daidano JK, Yousfani AH. Study on Presentations and Treatment Outcome of Plasmodium Falciparum Malaria. National Editorial Advisory Board 2017;28(11):69.
15. Rahman ud Din, Zeb S, Arshad M. Sofosbuvir Plus Daclatasvir in Chronic Hepatitis C Genotype 3 Naïve Patients. Med Forum 2019;20(1):7-9.
16. Kalhoro N, Zardari AA, Qureshi S, Sahito MR, Abbas A, Kumar G. Manifestation of Hepatitis C Virus Infection Positively Associated with Gallstones in Patients with Diabetes Mellitus. Med Forum 2021;32(5): 124-128.
17. Mujtaba SWA, Anwar A, Qaisar AM. Examine the Incidence of Liver Cancer in Patients Presented with Hepatitis B Virus and Hepatitis C Virus Infection. Med Forum 2020; 31(2):59-62.