

METABOLIC SYNDROME AMONG PATIENTS OF HEPATITIS C PRESENTING TO A TERTIARY CARE HOSPITAL

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Abstract

Background and objectives: Hepatitis C has evolved to become a global pandemic, equally affecting Pakistan as well. According to one WHO report the estimated prevalence of chronic hepatitis C is 1% worldwide (71 million people) while Pakistan alone contributes more than 12 million people to this figure, with Punjab reporting the highest prevalence of 6.7%. This infection does not only affect the Liver but also produces extrahepatic manifestations in various organs like skin, blood, and gastrointestinal tract as well as leads to many autoimmune conditions. There are many more linked to hepatitis but still remains unclear hence in this study we aim to assess the frequency of metabolic syndrome and the distribution of its features among patients of hepatitis C.

Methods: Conducted from 01.08.2019 to 02.01.2020 at Sheikh Zayed Hospital Lahore this cross-sectional study enrolled a total of 110 patients with hepatitis C presenting to the Outpatient Medicine Department. After informed consent, the demographic profile was noted in the proforma. The blood pressure and BMI of the patients were assessed using a standard protocol. A sample of 3ml of blood was taken for fasting lipid profile. Information regarding the study variable was recorded in the proforma and confidentiality of the data was ensured. SPSS was used to analyze the data.

Results: Of the total 110 hepatitis C patients enrolled, 54.5% were male, the mean age was 41.06 ± 14.78 years and the mean duration of having hepatitis C was 6.76 ± 3.27 months. Metabolic syndrome was present in 31.8% of the total study participants. Further analysis revealed that metabolic syndrome was not significantly associated with age (p -value = 0.955), gender (p -value = 0.970), or duration of hepatitis C (p -value = 0.125).

Conclusion: Metabolic syndrome affects 1 in every 3 patients of Hepatitis C presenting to the tertiary care hospital. Hence screening for metabolic syndrome must be performed among all patients suffering from hepatitis C from an early disease period and all such patients must be educated regarding prevention and control of this syndrome.

How to cite: Arif A, Saeed MA, Qureshi AA, Arif S, Arif Adeeba, Abbasi S, Afzal A. Metabolic syndrome among patients of Hepatitis C presenting to a tertiary care hospital. JAIMC 2023; 21(3): 190-193

Hepatitis C has evolved to become a pandemic globally, equally affecting Pakistan as well. According to one WHO report the estimated prevalence of chronic hepatitis C is 1% worldwide (71 million

people).¹ Using the data published between 2010-2015 a systematic review revealed that the seroprevalence of hepatitis C infection among adult Pakistanis was 6.8% while an estimated 6% of the population had an active infection.² To add more, approximately 399,000 people die each year due to this chronic disease.³

The Hepatitis C virus not only affects the liver but also produces extrahepatic autoimmune conditions and conditions of skin, blood and kidneys as well. To this date at least 30 different conditions have been found to be linked with chronic hepatitis C infection.⁴ For many of them clear association has been established however for the others a shred of good quality evidence needs to be found. Hence, in the present study we aim

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Submission Date: 26-07-2023
1st Revision Date: 05-08-2023
Acceptance Date: 15-08-2023

to assess the frequency of one such condition i.e. metabolic syndrome as the extrahepatic manifestation, not thoroughly studied.

A Patient is labeled as having metabolic syndrome if he/ she has any THREE OR MORE of the following features according to the WHO criteria i.e. Fasting Plasma glucose level of >110 mg/dl, Serum triglyceride level of >150 mg/dl or on the triglyceride-lowering drug, serum high-density lipoprotein levels of <40 mg/dl in males and <50 mg/dl in females or on a cholesterol-lowering drug, Blood pressure $>130/85$ mm of Hg and Central obesity: waist >102 cm in men and >88 cm in women.

Past literature suggests that there is a close relationship between the two conditions.⁵ It has been suggested that Hepatitis C infection affects the liver in a way that results in fatty liver and steatosis which are one of the features of metabolic syndrome.⁶ Each specific component of the metabolic syndrome itself is a mortality predictor independently among patients dealing with chronic liver disease, including individuals with an HCV.⁷ However, none of these studies have evaluated the role of age, gender, or duration of hepatitis C moreover recent data is missing for our population i.e. Pakistan, hence we aim to assess the frequency of metabolic syndrome among hepatitis C patients presenting at tertiary care hospitals.

METHODS

This descriptive cross-sectional study was conducted at Sheikh Zayed Hospital Lahore during a period of 6 months from 01.08.2019 to 02.01.2020. Non-probability consecutive sampling was used to select 110 patients of hepatitis C presenting to the Outpatient Medicine Department of Sheikh Zayed Hospital Lahore and this sample size was calculated with a 95% confidence level while keeping the margin of error at 8 % and taking expected frequency of 21.6%. All naïve patients with hepatitis C determined on history and lab investigations, of either gender, aged 15 to 65 years were included while all those hepatitis C patients already taking anti-HCV treatment or patients suffering from chronic kidney disease, decompensated liver

disease, SLE, or ischemic heart disease as well as hepatitis C patients co-infected with hepatitis B as determined on medical record and laboratory investigations were excluded from the study. Informed consent was taken from the participants who fulfilled selection criteria and Information regarding demographic profile was recorded in the proforma. Blood pressure was obtained from the brachial artery in the sitting position, two readings 20 minutes apart were taken and mean systolic and diastolic reading was taken as the average of two. Central obesity was measured midway at the level of umbilicus by taking waist circumference at the end of full expiration measured in centimeters. Over-night fasting was ensured and early morning fasting blood sample of about 5 ml was taken by venipuncture using aseptic technique for measurement of serum triglyceride, serum HDL cholesterol and serum fasting blood sugar by the phlebotomist. The sample was sent in a serum vial to the pathology laboratory of the hospital and results were collected the next day by the researcher. Metabolic syndrome was labeled as per operational definition of WHO. All information regarding the study was recorded in the proforma. Confidentiality of the data was ensured. SPSS 22.0 was used to analyze the data and chi-square test was applied to check statistical significance using p value <0.05 as significant.

RESULTS

Among 110 patients of hepatitis C included in the study, majority 60 (54.5%) of them were male while the mean age of all the participants were 41.06 ± 14.78 years which ranged from 15 to 65 years. The average duration of having hepatitis C was 6.76 ± 3.27 months.

Analysis also revealed that metabolic syndrome was found in one third i.e. 35 (31.8%) of the participants among which 19 (54%) were males while 16 (46%) were females. Metabolic syndrome was more common in patients 40 years of age or above 18 (51.4%). When data was stratified for gender, age and duration of the disease it was found that Metabolic syndrome was not significantly associated with age (p-value = 0.955),

gender (p-value = 0.970) or duration of hepatitis C (p-value = 0.125).

Table 1: Characteristics of Participants

Characteristics (n=110)		f (%)
Gender	Male	60 (54.5%)
	Female	50 (45.5%)
Metabolic syndrome	Present	35 (31.8%)
	Absent	75 (68.2%)
(n=110)		mean $\pm$ SD
Age (years)		41.1 $\pm$ 14.8
Duration of hepatitis C (months)		6.76 $\pm$ 3.3

Table 2: Metabolic Syndrome and Socio-Demography

Characteristics (n=110)		Metabolic syndrome		total	P-value
		yes	no		
Gender	Male	19	41	60	0.970
	Female	16	34	50	
Age (year)	<40	17	36	53	0.955
	$\geq$ 40	18	39	57	
Duration of Hepatitis C (months)	< 6	18	27	45	0.125
	$\geq$ 6	17	48	65	
Total		35	75	110	

DISCUSSION

The aim of this cross-sectional study was to assess the frequency of metabolic syndrome among the patients suffering from Hepatitis C, presenting at a tertiary care hospital. We enrolled 110 hepatitis C patients and the frequency of metabolic syndrome was assessed among them. Analysis revealed that roughly one-third (31.8%) of hepatitis C patients suffer from Metabolic syndrome and its presence is not related to gender, age, or duration of hepatitis C disease.

The findings of our study are consistent with a study that revealed the prevalence of metabolic syndrome in chronic HCV patients to be 37.9%, similarly, it also revealed that the co-existence of metabolic syndrome with hepatitis C was common in old age groups as revealed by our study. However, analysis regarding gender, revealed that the metabolic syndrome was more prevalent among females as compared to males (43.9 vs. 28.8%, $P=0.005$).⁸

Another piece of existing literature also shows

that Metabolic syndrome is significantly associated with HCV infection with an interaction of age. Metabolic syndrome was found to be significantly associated with HCV among non-obese and younger adults of age less than 60 years (PR 1.67, 95% CI 1.21–2.30, $p=0.002$). Frequent presence of metabolic syndrome in young age groups.⁹

Despite similarities of results with existing literature, our study highlights some limitations that accounts for differences stated above. This includes relatively small sample size and limited population diversity that limits the study of other variables affecting the outcome when generalized to a larger target population i.e. external validity of the study. Moreover, reliance on a single center for data collection, as well as cross-sectional design, may introduce biases inherent to such approaches.

Nonetheless, our study possesses several noteworthy strengths that deserve recognition. Firstly, despite not having a large representative sample size, our study effectively utilizes the data to draw relevant meaningful conclusions demonstrating the study's cost-effectiveness. Furthermore, cross-sectional design although limited in obtaining causal relationship allows for a snapshot of data at a specific time which helps capture broad overview and provide base for further evidence exploration. Thus, such strengths and limitations remind us to interpret the findings in their light and also emphasize the need for further research with larger, more diverse samples preferably through multi-center approach and analytical study designs to enhance the generalizability of our conclusion as well as to provide solid evidence to improve our management skills and practices.

CONCLUSION

Metabolic syndrome affects 1 in every 3 patients of Hepatitis C presenting to the tertiary care hospital. Hence screening for metabolic syndrome must be performed among all patients suffering from hepatitis C from an early disease period and all such patients must be educated regarding prevention and control of this syndrome.

REFERENCES

1. Viral hepatitis in the world. Available from: <https://www.who.int/multi-media/details/viral-hepatitis-in-the-world-map>
2. Umer M, Iqbal M. Hepatitis C virus prevalence and genotype distribution in Pakistan: Comprehensive review of recent data. *World J Gastroenterol*. 2016 Jan 28;22(4):1684-700. Available from: <https://pubmed.ncbi.nlm.nih.gov/26819533/>
3. Hepatitis C: Practice Essentials, Background, Pathophysiology. Available from: <https://emedicine.medscape.com/article/177792-overview>
4. Jukić LV, Kralj D, Jukić LV, Kralj D. Extrahepatic Manifestations of Hepatitis C Virus Infection. Update on Hepatitis C. 2017 Oct 4; Available from: <https://www.intechopen.com/chapters/56912>
5. Negro F, Alaei M. Hepatitis C virus and type 2 diabetes. *World J Gastroenterol* 2009 Apr 7;15(13):1537-47. Available from: <https://pubmed.ncbi.nlm.nih.gov/19340895/>
6. Kotronen A, Yki-Järvinen H. Fatty liver: a novel component of the metabolic syndrome. *Arterioscler Thromb Vasc Biol*. 2008 Jan;28(1):27-38. Available from: <https://pubmed.ncbi.nlm.nih.gov/17690317/>
7. Stepanova M, Rafiq N, Younossi ZM. Components of metabolic syndrome are independent predictors of mortality in patients with chronic liver disease: a population-based study. *Gut* 2010 ;59(10):1416-3. Available from: <https://pubmed.ncbi.nlm.nih.gov/20660697/>
8. Aziz H, Gill U, Raza A, Gill ML. Metabolic syndrome is associated with poor treatment response to antiviral therapy in chronic hepatitis C genotype 3 patients. *Eur J Gastroenterol Hepatol*. 2014;26(5):538-43. Available from: <https://pubmed.ncbi.nlm.nih.gov/24642690/>
9. Rajkumar P, Dwivedi AK, Dodoo CA, Shokar NK, Salinas J, Lakshmanaswamy R. The association between metabolic syndrome and Hepatitis C virus infection in the United States. *Cancer Causes Control*. 2020 Jan 1;31(6):569-81. Available from: <https://pubmed.ncbi.nlm.nih.gov/32300943/>