

ORIGINAL ARTICLE

Assess Restricted Pulmonary Function in Chronic Hepatitis C Patients at Various PhasesFAISAL RAHMAN¹, ZAINAB RIZWAN², HUMA HAMEED³, SOHAIL HUSSAIN⁴, MUHAMMAD SAQIB HABIB⁵, TALAL SAFDAR⁶¹Assistant Professor of Medicine, University College of Medicine & Dentistry Lahore, Senior Consultant Physician Social Security Teaching Hospital Ferozepure Road Lahore²Assistant Professor Medicine, Fazaia Medical College Islamabad³Classified Radiologist, PAF Hospital Faisal, Fazaia Ruth PFAU Medical College, Karachi⁴Consultant Gastroenterologist and Hepatologist, Clinical Coordinator for Postgraduate Studies, Ziauddin University Karachi.⁵Assistant Professor of Medicine, Islamic International Medical College and Trust, Islamabad⁶Assistant Professor of Medicine, Fauji Foundation Hospital RawalpindiCorresponding author: Faisal Rahman, Email: faiz9r@gmail.com**ABSTRACT****Background:** Chronic hepatitis C infection has both hepatic and extra-hepatic symptoms, both of which are influenced by the inflammatory response triggered by HCV. Chronic HCV induces inflammation that manifests itself in the liver and beyond. Persistent HCV infection may be associated with reduced pulmonary functions especially in patients with high viremia levels.**Objective:** The objective of study was to examine restricted pulmonary function in chronic hepatitis C patients during different phases.**Study Design:** Cross-sectional study**Place and Duration:** Department of Medicine Social Security Teaching Hospital Ferozepure Road Lahore. From 01.02.2022 to 30.08.2022.**Methods:** There were 94 cases of chronic hepatitis included in this study. After gaining the participants' informed consent, we documented their age, sex, BMI, and smoking status in detail. Patients underwent for abdominal ultrasound. The anti-HCV antibody test was run with a third-generation ELISA (Ortho HCV ELISA) kit using 3 ml of blood and pulmonary function test were performed to evaluate restrictive lung disease. Data was entered and analyzed in SPSS 24.0 and presented as frequency and percentages.**Results:** Among 94 cases, 57 (60.6%) were males and 37 (39.4%) were females. Mean age of the patients was 46.9±4.53 years and mean BMI was 25.4±6.29 kg/m². Majority of the cases 51 (54.3%) had rural residency. There were 64 (68.1%) cases had smoking history. We found that 17 (18.1%) cases had severe HCV, 45 (47.9%) cases had moderate and 32 (34.04%) patients had mild HCV. There were 37 (39.4%) cases had restrictive pulmonary function among all cases. Among 37 cases of pulmonary disease, majority had severe HCV infection.**Conclusion:** We concluded in this study that the patient with HCV infection had higher incidence of restrictive pulmonary disease. Majority of the patients were males and had smoking history. Severe cases of HCV mostly had restrictive disease.**Keywords:** HCV, Restrictive Pulmonary Disease, Males, Smoking**INTRODUCTION**

Hepatitis C virus (HCV) mainly affects the liver, but can also present with extra hepatic manifestations.¹ One of the most important extrahepatic manifestations of HCV is pulmonary involvement. In chronic hepatitis C (CHC) patients, pulmonary involvement may emerge as interstitial pneumonitis and fibrosis, initiation/exacerbation of pre-existing chronic obstructive pulmonary disease (COPD) and asthma.²

There is increasing evidence suggesting that chronic hepatitis C infection can play an important role in interstitial pneumonitis, pulmonary fibrosis, the initiation/exacerbation of pre-existing asthma and COPD.² Previous research has demonstrated that HCV-related pulmonary disorders are mostly asymptomatic, which means that these disorders are mostly underdiagnosed or delayed.^{3,8} On the other hand, pulmonary fibrosis causes a progressive and devastating loss of pulmonary functions.⁴ Therefore, diagnosis of pulmonary involvement in the early stages is of great importance. To examine all HCV infected patients for lung function would not be cost-effective, so it is important to identify HCV-infected patients who are at increased risk of pulmonary involvement. As, the prognostic relevance of baseline HCV RNA levels is known, whether or not there was a causal relationship between viral load levels and pulmonary involvement was investigated in this study.⁹

The pulmonary involvements of HCV infection is mostly asymptomatic and progressive.^{3,4} Therefore, the clinical progression of HCV-related pulmonary disorders might contribute to increased mortality and morbidity of CHC infection, which indicates the importance of early diagnosis of HCV-related pulmonary disorders. However, there is no consensus in the literature as to whether routine screening with pulmonary function tests (PFTs) would be beneficial in these patients. In addition, there is no data to identify those at high-risk of lung involvement.

The aim of this study was to evaluate pulmonary function among patients with chronic hepatitis C infection of varying severity in our population that may contribute to literature about whether routine screening for lung functions is necessary in CHC patients. In this study, we aimed to limiting pulmonary function across all stages of chronic hepatitis C infection.

MATERIAL AND METHODS

This cross-sectional study was conducted at Department of Medicine Social Security Teaching Hospital Ferozepure Road Lahore. From 01.02.2022 to 30.08.2022. and comprised of 94 cases of chronic hepatitis C patients diagnosed by anti-HCV antibody and confirmed by HCV RNA. Patients between 25 – 60 years of age of either gender were included in the study. After an informed consent and approval of ethical review board a detailed demographic and clinical profile including age, sex, BMI, and smoking status was taken in detail. Patients with bronchial asthma, history of unstable angina or myocardial infarction within the previous month, heart failure, morbid obesity, diagnosed cases of lung infections, acute respiratory problems, liver cirrhosis and severe anaemia (HB < 7 mg /dl) corrected with blood transfusion within the previous 6 months, previous surgical procedure, acute exacerbation of pulmonary disease, and patients on hemodialysis were excluded. To rule out cirrhosis, a Radiologist with at least five years of experience scanned the abdomens of the selected participants, for a fatty liver, shrunken & irregular liver surface and capsule, splenomegaly, enlarged portal vein diameter, gastric varices, oesophageal varices and splenic varices & ascites. Hepatitis C severity was assessed by viral load.

Patients were given a printed dyspnea scale to rate their level of dyspnea before the test; after 10 minutes of rest, blood pressure, pulse rate, and oxygen saturation were recorded; patients were then instructed to walk, rather than run or jog, and

were given the option to stop the test and return to it when they felt more comfortable. Blood samples (3ml) were collected in vacutainers by a skilled phlebotomist following a clinical and spirometric evaluation for COPD was done; The severity of reductions in the forced vital capacity (FVC) was graded as Mild: 70–79% of predicted, Moderate: 60–69% of predicted and Severe: 35–49% of predicted. Data was entered and analyzed in SPSS 24.0 and was presented as frequency and percentages for demographic and clinical variables. Restrictive pulmonary function was cross tabulated with HCV classified infection (mild, moderate and severe) and statistical significance was evaluated using Chi square with $p < .05$.

RESULTS

Among 94 cases, 57 (60.6%) were males and 37 (39.4%) were females. Mean age of the patients was 46.9 ± 4.53 years and mean BMI was 25.4 ± 6.29 kg/m². Majority of the cases 51 (54.3%) had rural residency. There were 64 (68.1%) cases had smoking history. (table 1)

Table-1: Demographically details of enrolled cases

Variables	Frequency	Percentage
Gender		
Male	57	60.6
Female	37	39.4
Mean age (years)	46.9±4.53	
Mean BMI (kg/m ²)	25.4±6.29	
Residency		
Rural	51	54.3
Urban	42	45.7
Smoking history		
Yes	64	68.1
No	30	31.9

We found that 17 (18.1%) cases had severe HCV, 45 (47.9%) cases had moderate and 32 (34.04%) patients had mild HCV. (figure 1)

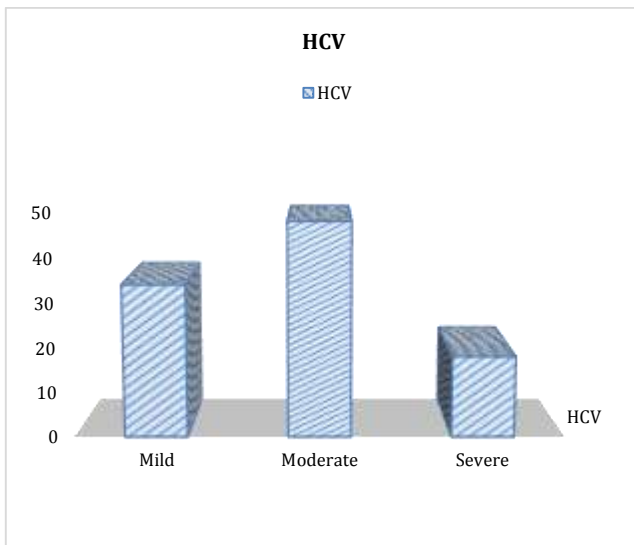


Figure-1: Stages of HCV

There were 37 (39.4%) cases who had restrictive pulmonary function among all cases. (table 2)

Table-2: Frequency of restrictive pulmonary disease among all cases

Variables	Frequency	Percentage
Restrictive pulmonary disease		
Yes	37	39.4
No	57	60.6

Among 37 cases of pulmonary disease, majority were had severe HCV infection. (table 3)

Table-3: Association of disease with severity of HCV

Variables	Frequency	Percentage
Restrictive pulmonary disease		
Severe HCV	15	40.5
Mild HCV	10	27.03
Moderate HCV	12	32.4

DISCUSSION

There has been a significant increase in the number of studies linking chronic viral hepatitis C to respiratory illnesses. Also, the existence of a link between chronic HCV infection and the aetiology of ILDs is now supported by investigations of an immunological response to CD8+ T cells and inflammatory cytokines. [11,12]

In current study 94 patients of HCV infection were presented. Among 94 cases, 57 (60.6%) were males and 37 (39.4%) were females. Mean age of the patients was 46.9 ± 4.53 years and mean BMI was 25.4 ± 6.29 kg/m². Majority of the cases 51 (54.3%) had rural residency. There were 64 (68.1%) cases had smoking history. These findings were comparable to the previous studies. [13,14] There appears to be a plethora of extrahepatic symptoms of chronic HCV infection, including those in the lung. Symptoms of increasing liver disease and the use of HCV drugs can have secondary consequences on lung function. Because of lung inflammation, the presence of viremia is also linked to an aberrant spirometric reading. [14] In our study 17 (18.1%) cases had severe HCV, 45 (47.9%) cases had moderate and 32 (34.04%) patients had mild HCV.

The results of this study suggest that COPD is becoming an important cause of illness and death among people with HCV. COPD in HCV patients can be detected early through screening of high-risk populations. A decreased FEV1 can serve as a prognostic sign for the identification of HCV infection. Findings confirm a higher frequency of HCV in patients with more advanced COPD. There were 37 (39.4%) cases had restrictive pulmonary function among all cases. Among 37 cases of pulmonary disease, majority had severe HCV infection. Results were in line with the previous study.[15] Similarly, the study by Mahmoud M. El-Habashy et al. found that patients with COPD who also had chronic HCV infection had significantly lower lung function than those who did not have HCV. These results imply that persistent HCV infection contributes to the rapid decrease of pulmonary function seen in COPD patients. [16]

Patients with COPD should be screened for anti-HCV antibodies, and if diagnosed as HCV+ve and chosen for treatment with antiviral drugs, appropriate inquiry concerning the lung involvement of HCV should be undertaken to avoid future loss in respiratory capacity. The walk test may be a valuable screening tool for individuals at risk of developing issues owing to the transplant, and it should be administered to all patients receiving liver transplantation.

CONCLUSION

We concluded in this study that the patient with HCV infection had higher incidence of restrictive pulmonary disease. Majority of the patients were males and had smoking history. Severe cases of HCV mostly had restrictive disease.

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