FREQUENCY OF HEPATITIS C VIRUS IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AT A TERTIARY CARE SETTING

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OBJECTIVE: To determine the frequency of hepatitis C virus infection in chronic obstructive pulmonary disease (COPD) at a tertiary care settings.

METHODS: This cross-sectional study was conducted at Liaquat University of Medical & Health Sciences Jamshoro form 10th April to 10th October 2013. Patients of either sex and ages form 30-65 years having COPD of at least three years who gave informed and written consent were enrolled. Blood samples of COPD patients were sent to hospital laboratory for detection of HCV antibodies via second generation ELISA. Patients having asthma, chronic liver disease, history of blood transfusion and surgical procedure in previous six months were excluded.

RESULTS: Mean age of enrolled participants was 44.41±3.5 years, ranging from 30-65 years. Male and female ratio was 1.8:1. Mean duration of illness was 3.55±0.222 years. Frequency of hepatitis C virus positivity in patients of COPD was 9(8.4%). Of 59 patients of <45 years of age, 3(5.1%) were positive for HCV and 6/48 (12.5%) patients of >45 years of age were positive for HCV (p=0.153). Of 69 male patients, 3(4.3%) were positive for HCV compared to 6/38(15.8%) female patients (p=0.05). Comparing analysis of HCV positivity with regard to duration of COPD, 1/53 (1.9%) patients with duration of illness up-to 3.5 years was positive for HCV compared to 8/58 (14.8%) patients with duration of illness of >3.5 years (p=0.0017).

CONCLUSION: Frequency of hepatitis C virus positivity in COPD patients was 8.4%. Earlier and prompts treatment should be initiated to minimize HCV related morbidity.

KEY WORDS: Hepatitis C (MeSH), Chronic Obstructive Pulmonary Disease (MeSH), Chronic Obstructive Airway Disease (MeSH)

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is estimated to affect 32 million peoples and fourth leading cause of death in United States. Patients typically have symptoms of chronic bronchitis and emphysema but classic triad also include asthma[1]. The global initiative for chronic obstructive lung disease (GOLD) guidelines define COPD as a disease state characterized by airflow limitation that is not fully reversible, usually progressive and associated with an abnormal inflammatory response in lungs to inhaled noxious particles or gases[2].

Hepatitis C virus (HCV) is a hepatotropic virus that causes hepatic and extra-hepatic disease including mixed cryoglobulinemia, lichen planus, porphyria cutanea tarda, B-cell non-Hodgkin's lymphoma NHL), monoclonal gammopathies etc[3]. A growing pile of evidence support that pulmonary involvement is one of the extrahepatic manifestations of chronic HCV infection[4].

In Pakistan, prevalence of HCV infection varies between 4-7%[5]. Several reports have suggested an important role for latent viral infections in particular adenovirus and human immunodeficiency virus, in etiology and/or progression of COPD[6]. Based on these reports, Kanazawa H hypothesized that chronic HCV infection might also function as a trigger for inflammation in the lungs hence either initiating or exacerbating the development of COPD.[7] Silva DR, performed a cross-sectional study to determine the prevalence of HCV infection in a sample of COPD patients and found prevalence of HCV infection in COPD was 7.5% (95% CI 6.52-8.48)[8]. Another study showed the HCV prevalence of 8.3%[9]. One Brazilian study also showed high prevalence of HCV in COPD patients and indicate more severity of the disease[8].

There are a few studies on frequency of hepatitis C virus infection among COPD patients in the world, and as far as we are aware, no previous study has focused on this topic in our setup, so we planned this study to determine the frequency of hepatitis C virus infection in chronic obstructive pulmonary disease (COPD) at a tertiary care settings. Hence strategies could be adopted to screen HCV infectivity in COPD patients and

therefore earlier treatment could be initiated in order to minimize HCV related morbidity.

METHODOLOGY

This descriptive, cross-sectional study was conducted in Medical Unit-I of Liaquat University of Medical & Health Sciences, Jamshoro from 10th April to 10th October 2013. The ethical committee of institute has given approval for study protocol.

Patients of either sex and ages form 30-65 years having COPD of at least three years were considered eligible for enrollment in the study. Written informed consent was taken from study patients. Sampling technique was non-probability purposive sampling. Diagnosed COPD patients were confirmed through spirometry by a consultant pulmonologist. Spirometer was used in sitting position with a nose clip after two to three slow expiratory vital capacity measurement at least three forced expirations. After confirmation of COPD, blood samples were sent to hospital laboratory for detection of HCV antibodies via second generation ELISA. Patients having asthma, chronic liver disease, history of blood transfusion and any surgical procedure in previous six months were excluded.

Data was collected and recorded in pre-designed proforma. It was analyzed on computer using SPSS version 18.0. Frequency and percentage were computed for qualitative variables like gender and frequency of HCV. Mean±SD was computed for continuous variables like age and duration of illness. Stratification was done with regards to age, sex and duration of disease in order to see effect of these variables on outcome via chi-square test and p-value <10.05 was considered significant.

RESULTS

A total of 107 patients of COPD were enrolled in this study. Mean age of participants was 44.41±13.5 years, ranging from 30-65 years (Graph I). There were 69 (64.5%) males and 38(35.5%) females. Male and female ratio was .8:1. Mean duration of illness was 3.55±0.222 years (Graph II).

Frequency of hepatitis C virus positivity in cases of COPD was 9/107 (8.4%). Stratified analysis of hepatitis C patients for bases of age, sex, and duration of illness were summarized in Tables I to III. Of 59 patients of less than 45 years of age, 3(5.%) were positive for HCV and 6/48 (12.5%) patients of more than 45 years of age were positive for HCV (p=0.153). Of 69 male patients, 3(4.3%) were positive for HCV compared to 6/38 (15.8%) female patients (p 0.05). Comparing analysis of HCV positivity with regard to duration of COPD, /53 (.9%) patients with duration of illness up to 3.5 years was positive for HCV compared to 8/58(14.8%) patients with duration of illness of >3.5 years (p. 0.0017).

DISCUSSION

Chronic HCV is an infection that is associated with the rapid decline of lung function in patients with COPD[7]. It is known that patients having HCV infection are at higher risk for development of some extra hepatic conditions, while

TABLE I: STRATIFICATION OF HCV IN PATIENTS WITH COPD BY AGE

		Age Group		Total	Chi Square test
		< 45 years	> 45 years		
HCV	Positive	3	6	9	p = 0.153
		5.1%	12.5%	8.4%	
	Negative	51	42	98	
		94.9%	87.5%	91.6%	
Total		59	48	107	
		100.0%	100.0%	100.0%	

TABLE II: STRATIFICATION OF HCV IN PATIENTS WITH COPD BY SEX

		Gender		Total	Chi Square test
		Male	Female		
HCV	Positive	3	6	9	p = 0.05
		4.3%	15.8%	8.4%	
	Negative	66	32	98	
		95.7%	84.2%	91.6%	
Total		69	38	107	
		100.0%	100.0%	100.0%	

TABLE III: STRATIFICATION OF HCV IN PATIENTS WITH COPD BY DURATION OF DISEASE

		Duration of Disease		Total	Chi Square test
		Up to 3.51 years	>1 3.51 years		
HCV	Positive	1	8	9	p = 0.05
		1.9%	14.8%	8.4%	
	Negative	52	46	98	
		98.1%	85.8%	91.6%	
Total		53	54	107	
		100.0%	100.0%	100.0%	

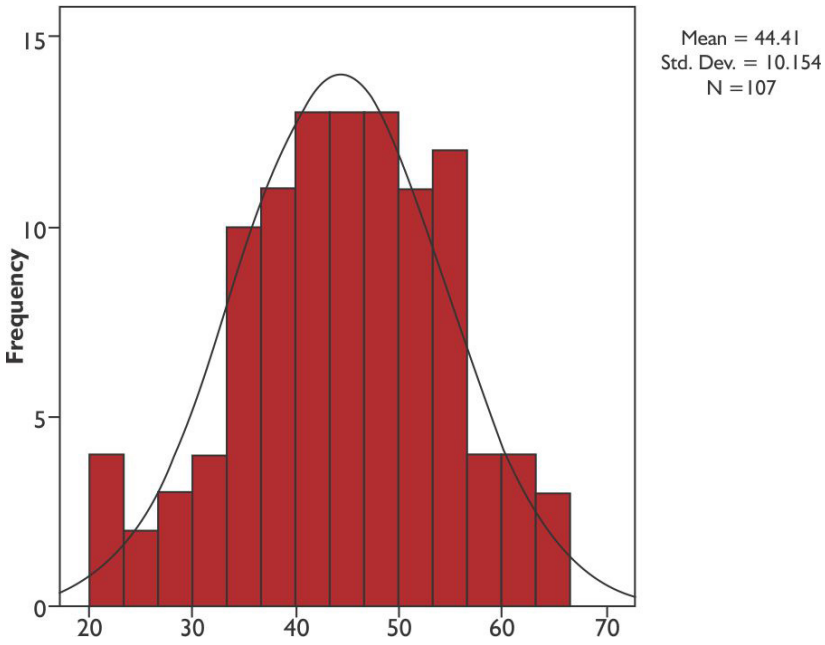

Figure 1: Age1 distribution1 of1 enrolled1 participants (n-107)

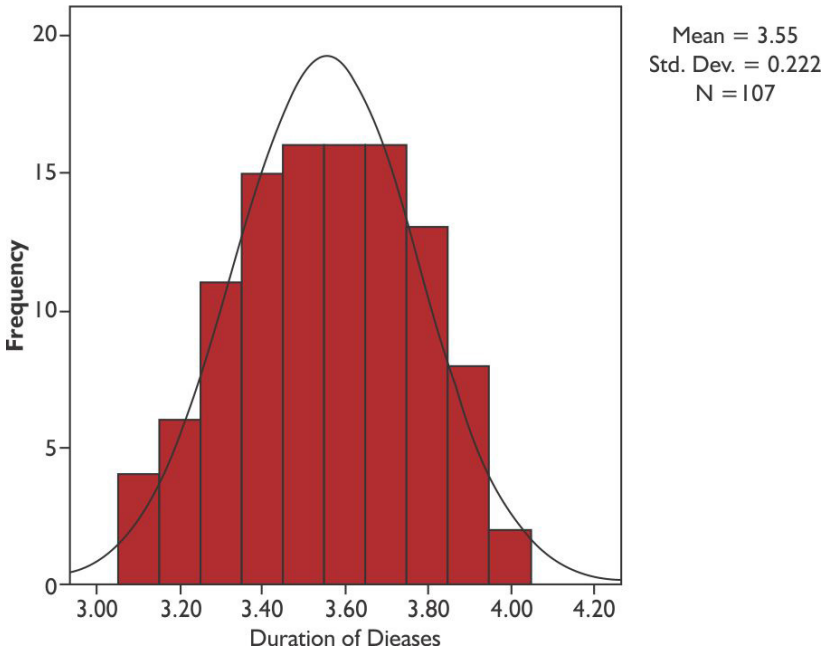

Figure 2: distribution1 of1 duration1 of1 disease (n-107)

the association of some extra hepatic conditions with HCV is quite clear, as for other conditions, the association is strongly suspected and is based only on some anecdotal data. In few disorders, associations with HCV have been defined on the basis of pathogenesis and higher prevalence of the disorder in patients than it controls (such as mixed cryoglobulinaemia, B-cell NHL, monoclonal gammopathies, porphyria cutanea tarda and lichen planus). Hepatitis C virus (HCV) infection is associated with wide series of extra hepatic manifestations including mixed cryoglobulinemia, lichen planus. Porphyria cutanea tarda, B-cell NHL, monoclonal gammopathies, etc[10]. There has been a growing number of evidence supporting the notion that pulmonary involvement is one of the extra hepatic manifestations of chronic HCV infection[4]. Within Pakistan prevalence of chronic HCV infection differs between 4- 7%[4]. There have been several reports suggesting the important role of latent virus within particular adenovirus and human immunodeficiency virus (HCV) in the etiology and progression of chronic obstructive disease (COPD)[6]. With accordance to these reports Kanzawa H, hypothized that chronic HCV infection might also be the cause of the trigger for inflammation in the lungs, hence either initiating or exacerbating the development of COPD[7]. In addition, some researchers suggest that airway disease may be related to the underlying chronic inflammatory disorders such as inflammatory bowel disease or autoimmune thyroid disease SILVA DR performed a cross sectional study to determine the prevalence of HCV infection in a sample of COPD patients and found prevalence of HCV infection in COPD was 7.5% (95% CI 6.52-8.48)[8]. Another study showed HCV prevalence of 8.3%[9]. Study from Brazil showed high prevalence of HCV in COPD patients and was indicative of more severity of disease[8]. A study investigating co-morbid medical and psychiatric illness and drug addiction in HCV infected and non-infected soldiers from USA suggested that HCV infected patients had higher incidence of diabetic, anemia, hypertension, COPD/asthma, cirrhosis due to hepatitis B and C[11]. While another study presented at least one pulmonary alteration evidenced either by pulmonary function tests, carbon monoxide diffusing capacity, or high resolution computed tomography in 75% of patients with chronic HCV infection[12]. In some cases, pulmonary interstitial involvement may be without evident respiratory symptoms[13]. However, the data on the prevalence of HCV infection among patients with COPD and *vice versa* is scanty. There are few studies on frequency of hepatitis C virus infection among patients with COPD at present time anywhere in the world and no previous study has focused in this topic in our set up.

Our study revealed that patients with COPD have a higher prevalence of HCV infection which is up to (8.4%). An argue

can be raised that patients with COPD have an increased risk of exposure to HCV infection because of chronic nature of their disease and frequent admission to hospital may increase risk of exposure.

The final result that the study showed that although there was no difference between age group. The mean age in HCV positive cases was 44.11± 3.8 years and in HCV negative cases was a 42.69±1 year. However sex and duration of COPD had higher prevalence of HCV. Female patient of COPD and duration of illness > 3.5 years was found to be significant in results. (p 0.05 & p 0.0017 respectively).

The role of gender in the development and progression of COPD is quite controversial, historically COPD has been for more frequent in males than in females related to pattern of smoking and occupational exposure[14]. Prevalence rate for HCV in our study was (4.3 in male and 15.8 in female overall 8.4%). Similarly, a study from Turkey suggested that the prevalence of HCV among the male subject was 15.4% while within the females it was 6%[11]. The higher frequency of positive HCV in patients with duration of COPD of 3.5 years can be explained that1 the longer duration of COPD have high chance of getting HCV and the lungs are more compromised because of long standing COPD.

Data suggest that COPD patients have increased prevalence of HCV infection. HCV infection may have some long term effect on pulmonary tissue as well as same as an additional risk factor for development of COPD.

CONCLUSION

This study concludes that frequency of hepatitis C virus positivity in COPD patients is around 8.4% in our set up, therefore an early and prompt treatment should be initiated to help in minimizing the HCV related morbidity.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

AHQ: Concept & study design, acquisition &analysis of data, drafting the manuscript, final approval of the version to be published

ASH: Drafting the manuscript, final approval of the version to be published

SMIS SMM: Acquisition of data, critical revision, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declare no conflict of interest

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NIL