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PULMONARY HYPERTENSION IN PATIENTS WITH IDIOPATHIC PULMONARY FIBROSIS BY USING ECHO CARDIOGRAPHY

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ABSTRACT

INTRODUCTION: Pulmonary hypertension has been linked to significantly worse outcomes in patients with idiopathic pulmonary fibrosis, who frequently experience confusion in their treatment. Idiopathic pulmonary fibrosis is a type of undiagnosed, progressive, chronic, fibrosing interstitial pneumonia that primarily affects older people. Right heart failure, reduced exercise capacity, and death are the outcomes of pulmonary hypertension, a group of destructive diseases. **OBJECTIVE:** Using a non-invasive technique called echocardiography, This study sought to determine the prevalence of pulmonary hypertension in idiopathic pulmonary fibrosis patients. **METHODOLOGY:** This descriptive cross-sectional study was conducted at the Jinnah Postgraduate Medical Center in Karachi's department of chest medicine, among 96 patients of aged 50-70 years. Patients with idiopathic pulmonary fibrosis of either gender were included. Patients were selected through non-probability purposive sampling. All the included patients were assessed for pulmonary hypertension echo cardiography under the supervision of consultant having > 5 years of experience. All the collected information was entered into the predesigned proforma. **RESULTS:** Mean age and duration of pulmonary hypertension were 62.36±6.16 years and 3.94±0.49 months respectively. Majority of the patients were female. The frequency of Pulmonary hypertension was found to be 38 (40%) in patients with idiopathic pulmonary fibrosis. **CONCLUSION:** It is concluded that frequency of pulmonary hypertension is moderate. Evaluation of the presence of PH in patients with IPF may be helpful in determining the progression and prognosis of the disease. Echocardiography is non-invasive and less expensive method to detect pulmonary hypertension. **KEYWORDS:** Pulmonary Hypertension; Idiopathic Pulmonary Fibrosis; Non-Invasive; Echocardiography.

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INTRODUCTION

The IPF (Idiopathic pulmonary fibrosis) also identified as CFA (cryptogenic fibrosing alveolitis) is a disorder of pulmonary diseases chronic in origin described by thick internal covering of lungs & interstitium fibrosis [1]. In patients with IPF, determining whether PH is present may be helpful. IPF is the most common type pneumonia of interstitial, according to the ATS (American Thoracic Society) & ERS (European Respiratory Society) , there were 13 cases per thousand people in the overall population [2]. Idiopathic pulmonary fibrosis (IPF) is a exact type of unrevealed, advanced, chronic, fibrosing interstitial pneumonia that frequently upsets older people and has a poor prognosis. It is observed that chronic respiratory diseases burden is growing globally. Including general respiratory disorders like COPD and asthma, less famous illnesses like pulmonary hypertension also add to the worldwide burden related to respiratory diseases.[3] A group of destructive diseases known as pulmonary hypertension (PH) causes right heart failure, loss of workout capability, & demise. IPF is frequently complicated by PH, and the worse outcomes are linked to PH[4-7]. Patients suffering from IPF were assessed for transplantation of lung 1 provided majority of the statistics about the incidence & importance of Pulmonary HTN. Due to differences in the capacity period of Pulmonary HTN throughout the development of illness, as well as in the diagnosis method & Pulmonary HTN definition criteria, prevalence of Pulmonary HTN in Idiopathic pulmonary fibrosis patients wide-ranging from 8.1% to 86.4%. In IPF patients, previous research has shown that reduced lung diffusing capacity for DLCO (carbon monoxide), additional O2 necessity, or reduced workout ability may enhanced reveal the co-occurrence of PH [4-6, 8.] According to Nathan et al.[9], there was a poor correlation between PH and pulmonary task para-meters like FVC (forced vital capacity) & TLC (total lung capacity).[10] In patients with IPF (idiopathic pulmonary fibrosis), PH (pulmonary hypertension) was found to be 23.5 percent 10 to 55% 8 in other studies. In addition, studies [11, 12] demonstrated a correlation between plasma BNP (brain natriuretic peptide) & SPAP (systolic pulmonary artery pressure) in IPF patients & suggested that BNP can be utilized as marker to evaluate the prediction of idiopathic pulmonary fibrosis, patients with pulmonary hypertension [13, 14.] It is known that for diagnosis of pulmonary hypertension among idiopathic pulmonary fibrosis), patients the right-heart catheterization (RHC) is the benchmark [15, 16]. Though, it is an invasive procedure with substantial chances of complications. The noninvasive techniques for diagnosing PH among IPF might advance the safety of patient and decrease cost. The capability to foresee which IPF patients have PH using noninvasive measures may steer the choice of patients for RHC for confirmation of its existence. When idiopathic pulmonary fibrosis patients have a high burden of pulmonary hypertension, it is a sign that their condition is getting worse. Because of this, they need to be treated quickly to avoid negative outcomes. This is especially important in developing nations, where a large number of people live in rural areas and have low socioeconomic status. Most of the time, patients don't report their condition until much later because they don't have access to medical facilities or don't have the money to pay for them. Therefore, it is the need of hour to treat the patient's effectively and to make the strategies for proper and timely management of pulmonary hypertension

and to improve the class of carefulness we provide to these patients. Using non-invasive technique called echocardiography, the purpose of present learning is to ascertain the occurrence of P HTN in subjects with IPF(idiopathic pulmonary fibrosis).

METHODOLOGY

96 patients from chest medicine department at JPMC (Jinnah Postgraduate Medical Center), Karachi, amongst the ages of 50 & 70 participated in presnt descriptive cross-sectional research. Both male and female idiopathic pulmonary fibrosis patients were included. Patients with history of drug toxicities due to chemotherapy drugs (bleomycin, methotrexate, cyclophosphamide), History of connective tissues disorder, History of obstructive pulmonary disease like asthma, Signs of respiratory or cardiac failure, Patients with history of pulmonary embolism and Chronic disorders like Chronic hepatitis C, HBV, Liver cirrhosis asses on U/S were omitted from this research. subjects were nominated through purposive sampling (non-probability). All the included patients were assessed for pulmonary hypertension echo cardiography under the supervision of consultant having > 5 years of experience. All the collected data were entered into the predesigned Performa by researcher. 20th version of SPSS was used to investigate the statistics. For weight, height, and BMI, age, duration of pulmonary fibrosis, , the mean SD was calculated. Gender and the outcome variable, pulmonary hypertension (yes/no), were analyzed for frequency and percentages. To determine their effect on the outcome variable, effect modifiers were controlled by stratifying by age, gender, duration of pulmonary fibrosis, and body mass index (BMI). Using the Chi-square test, a P-value of 0.05 or less was observed as statistically significant.

RESULTS

Table I:

	Mean	SD
Age (years)	62.3646	6.16291
Duration of Pulmonary Fibrosis (months)	3.9479	0.48925
Weight (kg)	60.3854	11.56435
Height(m)	1.7552	0.26817
BMI	24.1853	7.15693

The mean age of study participants was 62.36±6.16.Out of 96 patients 22 (23%) were male and 74 (77%) were female. The frequency of pulmonary hypertension was found to be 38 (40%) patients.

There were significant associations were obtained between status of patients (pulmonary hypertension yes/no) and the variables age, duration of pulmonary fibrosis, weight, height and BMI.

Table II:

		Pulmonary Fibrosis		
		Yes	**No**	**P-value**
Age	**50--62**	8	32	0.001*
	> 62	30	26	
Duration	**3--4**	5	19	0.033*
	> 4	33	39	
Gender	**Male**	13	9	0.033*
	Female	25	49	
Weight	**50--61**	10	27	0.046*
	> 61	28	31	
Height	**1.18--1.76**	13	32	0.044*

	> 1.76	25	26	
BMI	**16--24**	7	22	0.042*
	>24	31	36	

*p-value< 0.05 (chi-square test)

DISCUSSION

Idiopathic pulmonary fibrosis (IPF), is characterized by sustained worsening with advanced respiratory insufficiency tend to termination stage fibrosis. The occurrence of fibrosis result setup of pulmonary vasculature segments, which moreover directs toward the thrombosis and following fibrosis. This is compounded by hypoxia, which lead to pulmonary vasoconstriction, and results enduring structural variations in pulmonary blood vessels even far away from fibrosis areas [17]. Initial detection of pulmonary hypertension is identified as supportive among patients with chronic obstructive pulmonary disease, sing enduring oxygen therapy is related with improved survival [18]. Analogous approaches might be helpful for IPF even though there is a scarcity of such data. Echocardiography was indicative of pulmonary hypertension in 40% patients. Although noninvasive approaches for diagnosing pulmonary hypertension could not be as precise as invasive cardiac catheterization, they seem clinically pertinent from the point of management in extremely ill patients. Echocardiography is a substantial diagnostic move in any patient with doubt of pulmonary hypertension. It is noninvasive and permits a simple evaluation of right ventricular morphology, ejection flow dynamics and predict of pulmonary artery pressure. In the existence of tricuspid regurgitation, it provides an estimate of systolic pulmonary artery pressure, which is found to well correlate with pressure calculated through cardiac catheterization. There is a scarcity of literature on the subject of pulmonary hypertension among IPF patients. A study conducted among 13 patients, there was a correlation between development of pulmonary hypertension and hypoxemia [19]. In other research study, correlation was found between occurrance of pulmonary hypertension and lung volumes. Pulmonary hypertension was present when the FVC was less than 50% predicted [20]. In current research study out of 96 patients 22 (23%) were male and 74 (77%) were female. The frequency of pulmonary hypertension was found to be 40% in patients with IPF(idiopathic pulmonary fibrosis). In current study, there were significant associations obtained between age, duration of Pulmonary fibrosis, gender, weight, height and BMI with the advancement of pulmonary hypertension.

Pulmonary artery pressure is a vital estimator of survival in patients with interstitial lung disease [21]. Initial diagnosis of pulmonary hypertension could chose patients who might be approached with enduring domiciliary oxygen therapy [17].

For this research the data were obtained from hospital; hence the findings may not exhibit actual frequency and seriousness of the disease. Furthermore, the study was accomplished in single unit of hospital which also restrict its generality.

CONCLUSION

It is concluded that frequency of pulmonary hypertension is found to be moderate in our study. Hence, for IPF patients, assessing the occurrence of PHTN might be helpful in identifying illness prediction & development. Well-made, longitudinal, multiple center, prospective revisions using large sample size in Pakistan are essential to confirm the findings of the present study in the future.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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