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Original Article

Incidence of the Atrial Fibrillation in Patients with Chronic Obstructive Pulmonary Disease (COPD) in Sindh, Pakistan

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a major public health problem and leading cause of death globally. COPD fails to receive adequate attention from the health care community and government officials, with these concerns in mind we designed our study. **Objective:** To find out the incidence of atrial fibrillation in patients with COPD. **Methods**: A cross-sectional study was conducted from 12th February 2019 to August, 2020 at the Department of Pulmonology, Ghulam Muhammad Maher Medical College teaching Hospital, Sukkur. N=150 patients with chronic obstructive lung disease were involved in this study. The Criterion for the selection of patients for the study was those patients who was a diagnosed case of COPD. The exclusion criteria were known asthmatic patients and the case of restrictive lung diseases; history of ischemic heart disease, already on cardiac medication, patients with hyperthyroidism whereas the percentages, mean and Standard deviation were computed for study variables. **Results:** During One year and six months phase, patients who had COPD for > 3-Year duration were explored and study. The mean, SD for age (years) of citizens of Sindh Rural and Urban was 59.52 ± 7.81. Regarding gender, male 64 % and female 36 % individuals whereas the Atrial Fibrillation (AF) was identified in 62 % patients of COPD. **Conclusions**: High risk of AF has been identified among the COPD patients in Pakistani Populace. Hypertension and CHF among the COPD patients were notable as self-sufficient hazard features for new beginning of AF.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is the key cause of dying globally. COPD is currently ranked the 4th maximum common exact base of death worldwide and predicated to be the 1/3 through way of 2030 [1, 2]. COPD is characterized by using slowly progressive development of airflow trouble that is poorly reversible, in sharp contrast to asthma in which there's variable airflow obstruction this is normally reversible spontaneously or with remedy [3]. Atrial Fibrillation (AF) is a distinctive arrhythmia seen in clinical practice. AF is additionally a significant vulnerability issue for stroke, and the threat of AF augmentation with grows old, climbing on or after 15% at an age of 50 to 59 years to 23.5% at an age of 80 to 89 years [3]. AF in patients with Chronic Obstructive Pulmonary Disease is a principal origin of morbidity and death globally [3]. The broad incidence in elderly men, 30 years or above is more than 14 % as compared to women, it's far considerably higher [4, 5]. In women the prevalence of Atrial Fibrillation in patients with COPD is estimated from 7 % to 8.2 % in different studies [6]. Chronic Obstructive Pulmonary disease is at current rate the exclusively frequent particular purpose of casualty globally and it's predicated

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that it becomes the third most common cause of death in patients of Atrial fibrillation with chronic obstructive pulmonary disease by the 2030 [7, 8]. In COPD patients the occurrence of AF impairs diagnosis, while presence of COPD in Atrial fibrillation patients additionally seems to have a unique effect on atrial fibrillation progression [9-11]. The Patients with COPD had an advanced risk for developing AF among the Pakistani populace. COPD patients, hypertension and CHF were eminent autonomous risk factor for resurgence AF, and a mount up evidences indicated that COPD is associated with AF [12]. Many studies reported that the abridged enforced expiratory quantity in one 2nd (FEVI) is an impartial predicator for traditional cardiovascular danger elements, height and Threat ratios of AF inspect the lacking with the most quartile of FEV1 [13, 14]. From 1985 to 1999, hospitalizations for Atrial Fibrillation all gone triple, and the high occurrence of Atrial Fibrillation bring about more remarkable curative consumption [15, 16]. A past report practiced stable electrocardiography to display arrhythmias in patients with COPD and established the frequency of Atrial Fibrillation become first and fundamental more prominent in COPD patients [17, 18]. A study demonstrated that during hospitalization for AF, COPD patients have an expended span of emergency clinic remain and expended medical clinic death [19, 20]. COPD has been independently related to AF however the correct pathophysiological mechanisms are complex and yet to be completely understood. There is a scarcity of information on atrial fibrillation incident and exposure elements in sufferers with COPD in most of the research studies, and they require evidences with regard to populace in Pakistan [21-23]. The point of present study was to examine the rate of atrial Fibrillation in Pakistan with COPD and look into the sovereign risk factors for AF in this population. Investigating the effects of hypoxia on atrial electrophysiology of the study acquiesce divergent results. In affected person with COPD who developed AF, management of the basic pulmonary disorder and the corrections in acid-base unevenness and hypoxia are of most important and symbolize first line treatment.

METHODS

This was a cross-sectional study conducted from 12th February, 2019 to August, 2020. A total of one hundred and fifty patients with chronic obstructive lung disease were included in this study. This study was carried out at the Department of Pulmonology, Ghulam Muhammad Mahar Medical College teaching Hospital, Sukkur. The inclusion criterion for the study was those patients who were diagnosed case of COPD. The exclusion criteria were known asthmatic patients and the case of restrictive lung disease; history of ischemic heart disease, already on cardiac medications, patients with hyperthyroidism. After having selected cases for the study, careful history & examination was carried out in each patient in particular relation to respiratory and cardiovascular examination. The demographical and clinical profile of subjects was also noted. The co-morbidities were also explored through clinical history, physical examination and specific investigations (ECG and echocardiography) whereas the data were composed in pre-intended proforma. SPSS 16.0 version had been used to show Statistical analysis. Categorical data were presented as frequencies and percentages and the percentages, mean and Standard deviation were computed for study variables.

RESULTS

Total 150 patients with COPD have been studied during the period of 1.5 years in current study. The baseline characteristic of the all patients in the Figure 1 shows the total percentage of Selective parameters which is also included in Table 1.

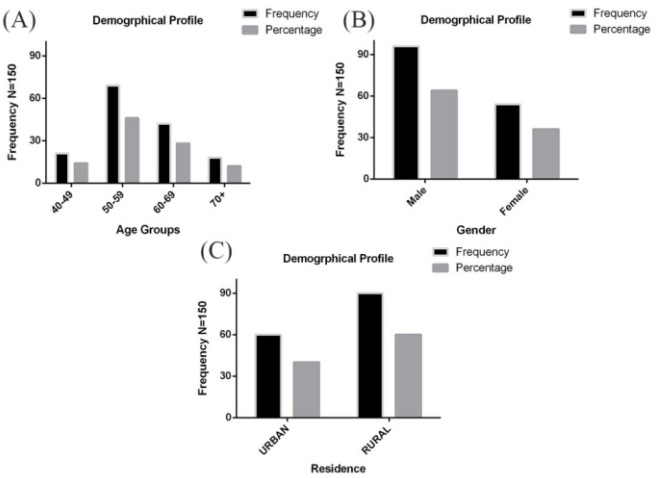

Figure 1: (A) shows the total percentage of each age group from the total frequency of COPD patients, 40-49 shows 14%, 50-59 (46%), 60-69 (28%) and 70+ (12%) correspondingly. (B) Gender group shows total percentage of Male (64%) and Female (36%) from the total COPD patients and (C) Residence group shows 40% for urban and 60% from rural areas from entire frequency of patients respectively Table 1 shows the total percentages vs. all parameters from the total 150 COPD Patients, Body mass index of the patients shows 27.5%, Female Gender shows 36%, Angina Class IV 30.2%, Previous wave myocardial infarction (MI) 21.9%, Q-wave MI within previous 30 days 15.9% and left ventricular ejection fraction <30% shows 17.2% among the total 150 COPD patients.

Parameter	COPD (n=150)
Body Mass index (BMI)	27.5 %*
Female gender	36 %
Angina class IV	30.2 %*
Previous Q-wave myocardial infarction (MI)	21.9 %*

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Q-wave MI within previous 30 days	15.9 %*
Left ventricular ejection fraction <30%	17.2 %*

*p < 0.05

Table 1: Patients Characteristics profile of study population

The demographical profile of study population shown in Figure 2. Demographical profile has been categorized in three parts, Age group, Gender and Residence. Furthermore, age groups were further divided into 4 groups, 40-49, 50-59, 60-69 and 70+ respectively. Gender group divided into two groups, Male and Female and Residence group have been divided into two groups, Urban and Rural.

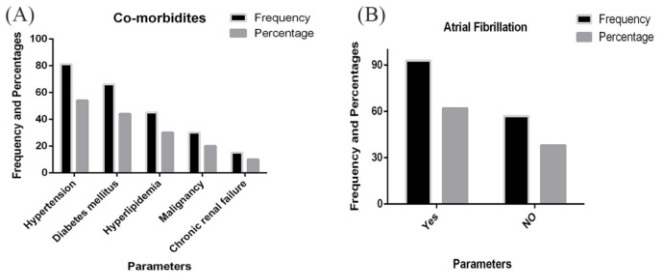

Figure 2: (A) Co-morbidity parameters like Hypertension, Diabetes mellitus, Hyperlipidemia, Malignancy and Chronic renal failure showed 54%, 44%, 30%, 20%, and 10% respectively in overall COPD frequency. (B) Atrial fibrillation diagnosed patients were 62% and un diagnosed 38%.

The demographical profile of study population shown in Table 2; In which mostly patients were male (64%) and female were 36 %. Among 150 patients 60% was belong to the rural area of the Sindh.

Parameter	Frequency (%) (N =150)
Age Groups	
40-49	21 (14%)
50-59	69 (46%)
60-69	42 (28%)
70+	18 (12%)
Gender	
Male	96 (64%)
Female	54 (36%)
Residence	
Urban	60 (40%)
Rural	90 (60%)

Table 2: The demographical profile of study population

The clinical profile of study population shown in Table 3. The mean ± SD for age (years) of population was 59.52 ± 7.81, whereas the atrial Fibrillation was identified in 62 % patients of COPD. Co-morbidities conditions have been found out through using different parameter for instance Hypertension, Diabetes mellitus, Hyperlipidemia, Malignancy and Chronic renal failure. The given parameters showed that highest frequency (81) of patients had hypertension accounts for 54%, second highest frequency (66) of the patients had Diabetes mellitus which accounts for 44%, Hyperlipidemia showed 30% in 45 patients, 30 out of 150 patients had malignancy which accounts for 20% and Chronic renal failure showed only 10% in 15 patients out of 150 COPD frequency. Moreover 93 patients had Atrial fibrillation which accounts for 62% and 57 patients doesn't diagnose with atrial fibrillation which accounts only 38% from total frequency of COPD.

Co-Morbidities	
Parameter	**Frequency (%) (N =150)**
Age Groups	
Hypertension	81 (54%)
Diabetes mellitus	66 (44%)
Hyperlipidemia	45 (30%)
Malignancy	30 (20%)
Chronic renal failure	15 (10%)
Atrial fibrillation	
Yes	93 (62%)
No	57 (38%)

Table 3: The Clinical profile of study population

DISCUSSION

Our Study promised few discoveries during our work on the rate of new-beginning of AF in COPD patients. In the first place, COPD was related to the danger of AF [24]. Chronic patients with COPD with male patients leading. The ARIC study, demonstrated that lower pneumonic capacity was correlated per a higher frequency of AF [14]. Our study indicated that COPD associations with AF which increased the mass of evidences. The incidence of AF in COPD has major influence on mortality, whilst the presence of COPD in AF has a particular effect on AF development. There are numerous studies of AF in COPD were conducted globally, the major constituent includes inflammation, in previous study [15]. CHF, hypertension, chronic kidney infection and inflammation were threat elements for AF in the elderly population [13]. Our present study showed that CHF and hypertension were likewise altogether associated by new-beginning AF in the COPD population. Related discoveries have been reported by who miscarried to uncover and influence of hypoxia on either atrial refractoriness or atrial condition [23]. COPD is an initial inflammable disease; the elevated levels of serum C-responsive protein (CRP) are hard to control in these patients. In addition, CRP is concomitant with lung vocation, age and O_2 immersion [23]. The subsequent component includes medicine [25, 26]. COPD patients are recommended respiratory medications, including β-agonists, anticholinergic medications. Meanwhile the β-receptors and adenylate cyclase is initiated via aminophylline and theophylline and β-agonists that prompting the mechanism of cyclic adenosine monophosphate (cAMP) and protein kinase A, which causes the phosphorylation of target proteins and prompts a compression of myocytes [27-29]. The chronotropic and depolarization impacts lead an

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arrhythmogenicity [30, 31]. Different variables that actuate AF in the COPD populace incorporate more established age, hypoxia, smoking, and cardiovascular parameters [32]. Our Current research showed that CHF and hypertension were similarly altogether concomitant by new-beginning AF in the COPD population but there are some boundaries to the present study.

CONCLUSIONS

The Patients with COPD had an advanced risk for developing AF among the Pakistani populace. Amin COPD patients, hypertension and CHF were eminent autonomous risk factor for resurgence AF. In this approach the outcomes similarly endorse that doctors could do with to expand examination and early mediation for COPD patients during examination.

Conflicts of Interest

The authors declare no conflict of interest.

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