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Clinical Profile of Pulmonary Arterial Hypertension Patients - A Tertiary Care Hospital Based Study

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Original Research Article

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Abstract: Pulmonary hypertension is one of the devastating disorders of the cardiovascular system. It is associated with poor survival and considerable morbidity. There is no single causative factor and it may represent the final common pathway for many systemic diseases. So it is of high importance to recognize the presentation of patients with symptoms suggestive of pulmonary hypertension and treat at the earliest. To study the epidemiological, clinical and echocardiographic profile of pulmonary hypertension. This was a prospective hospital based descriptive study. Patients presenting with symptoms suggestive of pulmonary hypertension were screened using detailed clinical proforma. Clinical examination was carried out in such patients followed by blood tests, chest radiography and ECG. Echocardiography was done in those patients and diagnosis was confirmed. The 52 cases, males constitute 65.4% and females constitute 34.6% (n=18). In our study, majority of cases presented with NYHA functional class 2, 3 and 4 symptoms. Dyspnoea on exertion was the most common presentation. Hypertension (42.3%) and Type 2 Diabetes mellitus (44.2%) were present in majority of cases. Of the personal habits, smoking (65.4%) was present in majority of cases. The common clinical findings were elevated JVP (88.5%), pitting pedal oedema (86.5%), palpable S2 (71.2%) and left parasternal heave (42.3%). Common auscultatory findings included loud P2 (98%), audible TR (50%), and RVS4 (50%). 63.5% cases had right ventricular systolic dysfunction and 8.1% had severe PAH (>60 mm Hg). This study provides information on the clinical, epidemiological and echocardiographic features of pulmonary hypertension in the subcontinent. Some findings are quite similar to the western data but some interesting observations have also emerged. There remains a need to spread awareness about pulmonary hypertension among the physicians since the diagnosis is usually missed in the early stages. The delayed diagnosis hampers the optimum management even in the current era of effective drug therapy.
Keywords: Pulmonary Hypertension; Echocardiography; clinical; Indian.

INTRODUCTION

Pulmonary hypertension (PH) is characterized by increase in pulmonary artery pressure and it is associated with significant morbidity and poor survival. The epidemiology of pulmonary hypertension in the Indian population is less well studied. The important causes of pulmonary hypertension also differ from that of the western population, where idiopathic pulmonary arterial hypertension (PAH) and PH due to left heart disease are common. In developing countries like India the prevalence of Rheumatic heart disease, coronary artery disease, congenital heart disease and COPD may contribute to majority of case burden of pulmonary hypertension [1]. Studies in the Indian population especially Kerala is limited. It is important to recognize the clinical presentations and the relative distribution of subcategories of PAH in our population. This study will generate more interest in the diagnosis of PAH and planning treatment strategies in our health care scenario.

MATERIALS AND METHODS

A Prospective hospital based descriptive study conducted in the department of General medicine of a tertiary teaching hospital in Kerala for a period of one year from the date of ethical clearance. All patients

diagnosed with pulmonary hypertension during the study period were included in the study. Patients were evaluated using a detailed clinical questionnaire. The patients were subjected to investigations such as blood tests, ECG and chest radiography. Patients who have findings suggestive of PAH were subjected to echocardiography. Patients who were found to have mild PAH were excluded from the study. The important parameters evaluated in echocardiography were chamber enlargement, left ventricular ejection fraction (LVEF), left ventricular diastolic dysfunction (LVDD), global hypokinesia / regional wall motion abnormality (RWMA), shunt lesions, valvular lesions, Tricuspid annular plane systolic excursion (TAPSE) and calculated RV systolic pressure (RVSP). Patients are classified into three categories of PAH by calculated RVSP[2] - 30-50 mm hg - mild PAH, 50-60 mm hg - moderate PAH, and >60 mm hg - severe PAH. All statistical calculations were analysed using SPSS software. Categorical variables were reported as frequencies with percentages. Unless otherwise indicated, continuous variables were expressed as mean+/-SD. When samples were normally distributed unpaired student t test was performed to compare 2 independent groups. Association of severity of TR with audible TR murmur was assessed using Fischer's exact test. Statistical significance was defined as p value <0.05.

RESULTS AND OBSERVATIONS

In the present study, a total of 52 patients were diagnosed as PAH on the basis of clinical and echocardiographic findings and were included for statistical analysis.

Table-1 - Age distribution of study subjects

Age (years)	Frequency	Percent
<30	1	1.9
31-40	5	9.6
41-50	17	32.7
51-60	14	26.9
61-70	12	23.1
>70	3	5.8

The age distribution of the study population is shown in table 1. About 32.7% of cases were of 30-40 years of age and 26.9% of cases were of 51-60 years of age. Of the 52 cases, males constitute 65.4% while females constitute 34.6% (Figure 1).

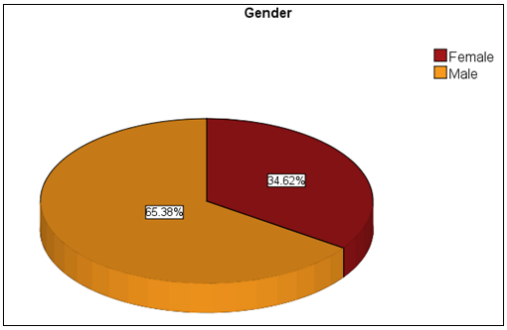

Fig-1: **Gender distribution of study subjects**

Education status and occupation of the study subjects are shown in table 2 and figure 2 respectively.

Table-2 -Education status of study subjects

Education	Frequency	Percent
Professional	2	3.8
Graduate	8	15.4
Diploma	9	17.3
Higher secondary	17	32.7
Basic school education	15	28.8
Illiterate	1	1.9

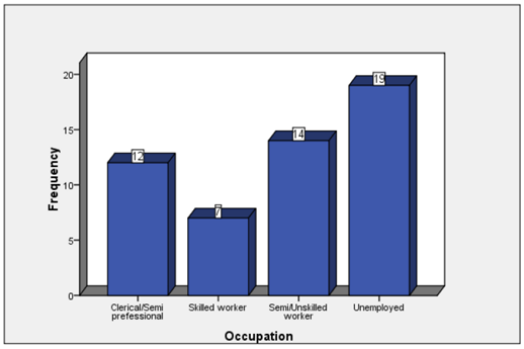

Fig-2: **Occupation of study subjects**

Table-3: NYHA functional class in study subjects

NYHA Functional Class	Frequency	Percent
2	17	32.7
3	27	51.9
4	8	15.4

In our study, majority of cases (51.9%) presented with NYHA functional class 3 symptoms. Class 1 symptoms were not found in any of the cases (Table-3). Of the personal habits, smoking (65.4%) and alcohol (3.8%) intake were present in the subjects. In the present study, significant family history of PAH was not found in any of the patients. Among the past medical history, hypertension (42.3%) and Type 2 Diabetes mellitus (44.2%) were present in majority of cases (Table 4).

Table-4: Past medical history of study subjects

Past history	No. of subjects	Percentage
Hypertension	22	42.3

Type 2 Diabetes mellitus	23	44.2
Coronary artery disease	7	13.5
Valvular heart disease	10	19.2
Patent ductus arteriosus	0	0
Atrial septal defect	4	7.7
Ventricular septal defect	0	0
Congestive cardiac failure	0	0
Cadiomyopathy	12	23.1
COPD	10	19.2
Interstitial lung disease	3	5.8
Connective tissue disorder	1	1.9
Chronic liver disease	2	3.8
Pulmonary thromboembolism	3	5.8
HIV	0	0
Malignancy	0	0
Haematological disorder	0	0

Table-5: Symptoms in study subjects

Symptom	No. of subjects	Percentage
Dyspnoea on exertion	52	100
Fatigue	18	34.6
Angina	11	21.2
Presyncope	23	44.2
Syncope	5	9.6
Edema of extremities	46	88.5
Abdominal dis tension	12	23.1
Orthopnoea	19	36.5
PND	19	36.5
Palpitation	10	19.2
Cough	15	28.8

Dyspnoea on exertion (100%) was the most common presentation. Other important symptoms were oedema of extremities (88.5%), presyncope (44.2%), fatigue (34.6%) and angina (21.2%) (Table 5). The common clinical findings were elevated JVP (88.5%), pitting pedal oedema (86.5) and palpable S2 (71.2%). (Table 6)

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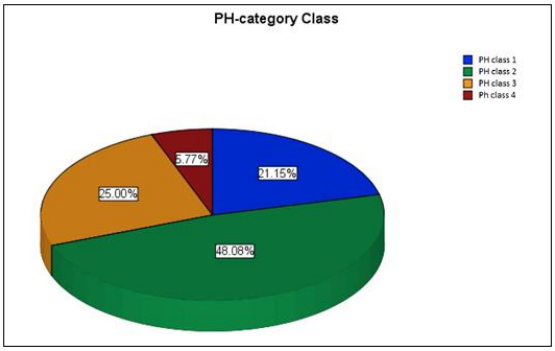
Table-6: Physical findings in study subjects

Examination findings	No. of subjects	Percentage
Elevated JVP	46	88 .5
Left parasternal heave	22	42 .3
Palpable S2	37	71 .2
Loud P2	51	98 .1
Audible tricuspid regurgitation murmur	26	50 .0
RVS3	17	32 .7
RVS4	26	50 .0
Peripheral oedema	45	86 .5
Tender hepatomegaly	10	19 .2

Echocardiographic findings

Right atrium and right ventricle were dilated in 75% and 71.2% cases respectively. About 63.5% cases were found to have right ventricular systolic dysfunction (TAPSE <16 mm). Right ventricular regional wall motion abnormality and hypertrophy were seen in 25% and 75% cases respectively. Severe, moderate and mild LV systolic dysfunction was diagnosed in 25%, 44.2% and 30.8% respectively. Global hypokinesia was documented in 26.9% cases. Grade 1, grade 2 and grade 3 LVDD was seen in 46.2%, 19.2% and 15.4% cases. Atrial septal defect was the only shunt lesion (17.7%) detected in the study. Among the mitral valvular lesions, mild to moderate mitral

stenosis was found in 9.6% cases. Mild to moderate and sever mitral regurgitation were documented in 46.2% and 3.8% cases respectively. MVP was detected in 1 case. Mild to moderate aortic stenosis was found in 13.5% and severe aortic stenosis was diagnosed in 1.9% cases. Mild to moderate aortic regurgitation was found in 11.5% cases and severe aortic regurgitation was detected in 5.8% cases. Severe, moderate and mild tricuspid regurgitation was found in 23.1%, 42.3% and 34.6% cases respectively. RVSP suggestive of severe PAH (i.e) >60 mm Hg was detected in 48.1% cases and moderate PAH in 51.9% cases.



In the present study, majority of cases belonged to class 2 (48.1%) followed by class 3 (25%).We did not find any case of class 5.

DISCUSSION

Our study was a single centre study carried out in the Department of General Medicine for a period of one year duration from 31 July 2015. Majority of cases fall between the ages of 41-70 years (82.7%). The age distribution was similar to data from the REVEAL registry [3] and French registry [4]. Of the 52 cases, males constitute 65.4% with a male-female ratio of 1.8:1. Females usually outnumber males in western studies such as REVEAL registry[3] and French registry [4]. However, Indian data showed a male predominance (male-female ratio is 1.5:1) [5]. Majority of patients had either basic school education (28.8%) or higher secondary education (32.7%). Majority of cases were unemployed (36.5%) and this may be attributed to the underlying PH which will affect the vocational status of the patient. Majority of cases presented with class 3 (51.9%) and class 2 (32.7%) symptoms. Class 4 symptoms were seen in (15.4%) of cases. REVEAL registry [3], French registry [4], Vaishali Patel *et al* [5] Pulmonary Hypertension Connection study [6], Rahul Mehrotra *et al* [7] show similar results. Dyspnoea on exertion was the most common presentation. Other important symptoms were oedema of extremities (88.5%), presyncope (44.2%) and fatigue (34.6%). Many studies such as Vaishali Patel *et al*,[5] Rahul Mehrotra *et al.* [7] showed similar findings.

Hypertension (42.3%) and Type 2 Diabetes mellitus (44.2%) were present in majority of cases. Other important specific etiological factors include cardiomyopathy (23.1%), valvular heart disease (19.2%) and chronic obstructive pulmonary disease (19.2%). An unusually high prevalence of diabetes mellitus was noted in the study. The higher prevalence of diabetes mellitus in this study may be due to the increased prevalence of diabetes mellitus in the Kerala population. This may be attributed to the Indians diet is different from that of the western diet in that it does not include complex carbohydrates. In the present study, significant family history of PAH was not found in any of the subjects. Since case reports of familial PAH were lacking, further studies have to be undertaken to address FPAH in India. Since the awareness of use of drugs causing PAH is lacking in our patients, we could not compile any data regarding this issue. Further studies are needed in future to add new information. The important clinical findings were elevated JVP (88.5%) and pitting pedal edema (86.5%). The common auscultatory findings were loud P2 (98%), audible TR (50%) and RVS4 (50%). Elevated JVP (77.8%), loud P2 (100%), audible murmur (44.4%) and central cyanosis (25.9%) were the most common clinical findings in a study by Rahul
Mehrotra *et al* [7].

In the present study, we found that majority of cases belong to group 2 (48.1%) followed by group 3 (25%), group 1 (21.2%) and group 4 (5.8). In their study group, Rahul Mehrotra *et al.* found that group 1 (72%) was the commonest type of PH followed by group 2 (16%), group 3 (7%) and group 4 (5%).There were no patients under group 5 and with familial PH [7].

The Pulmonary Hypertension Connection database included idiopathic (44%), familial (4%), connective tissue disorders (30%), congenital heart disease (11%), porto-pulmonary hypertension (7%), anorexigens (3%) and HIV (1%) in their study population [6, 8].

CONCLUSION

Pulmonary Hypertension remains under-diagnosed in developing countries like India despite recent advances made in the diagnosis and management of different groups of PH. Further studies were needed to understand the pathophysiology of group 4 and group 5 PH. Since our demographic and risk factor profile are different from of the western population, several registries for PH has to be set up across the country to study the clinical profile of different groups of PH in detail. Since there is no single causative factor for the development of PH and PH may represent the final common pathway for many systemic diseases, the

diagnosis of PH should be carried out in a systematic way as emphasized in our study.

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