Original Research Paper

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Pulmonary Medicine

ANALYTICAL STUDY OF AETIOLOGICAL AND CLINICAL PROFILE OF PATIENTS WITH CHRONIC COR PULMONALE PRESENTING TO A TERTIARY CARE HOSPITAL

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ABSTRACT The term corpulmonale was first introduced into the medical literature by white (1931). Prior to that, it was generally known as emphysema heart, pulmonary heart disease Ayerzas disease and rather eloquently as 'Black cardiacs'9. Corpulmonale traditionally defined as the right ventricular failure secondary to disorders that affect either the structure or function of the lungs. Chronic cor pulmonale can be diagnosed clinically, radiologically, electrocardiographically, by Echocardiography and also by invasive techniques. Objectives of this study is To identify the peak age of onset of corpulmonle and to identify the risk factors for the development of corpulmonale ,Common symptomatic presentation of corpulmonale, Various chest x- ray findings of corpulmonale. Electrocardiographic changes of corpulmonale and to compare aetiological factors of the disease with risk factors and various clinical and radiological factors.

KEYWORDS :

INTRODUCTION

Corpulmonale traditionally defined as the right ventricular failure secondary to disorders that affect either the structure or function of the lungs.The association of heart failure with chest diseases was not recognised until the beginning of the 20th century. Osler did not mention it in his Text Book of Medicine published in 1904 but referred to it in later editions. The term cor pulmonale was first introduced into the medical literature by white (1931). Prior to that, it was generally known as emphysema heart, pulmonary heart disease Ayerzas disease and rather eloquently as 'Black cardiacs'9. Different terms have been used by different workers, pulmonary failure (Fulton 1953), pulmonary hypertensive heart disease with arterial desaturation (Hecht, 1956), pulmonary heart failure (Stuart Harries and Henley, 1957), secondary pulmonary hypertensive cardiovascular disease (Meltingly, 1962) and chronic pulmonary hypertensive heart disease (Calland, 1963) are some of the terms used for the condition known today as cor pulmonale. No satisfactory definition has been provided so far for this condition. Strong in 1947 defined cor pulmonale as right ventricular hypertrophy due to the disorder of pulmonary circulation from any cause.

The condition was obscured by the accompanying pulmonary manifestations on one hand, and was identified on the other hand as some other form of heart disease. It is only recently that the clinical physiologists have worked out physiological relationships between chronic pulmonary disease and corpulmonale and still more recently that adequate methods of diagnosis have been established. Physiologists have now simplified the principles and methods of diagnosis so that physicians can add them to their clinical analysis. The wide disparities in the reported incidence of the disease in different areas may simply reflect these inconsistencies in the diagnostic terminology and conventions. On the other hand, these reports do indicate real variations in disease experience and may give important clues to those differences in local environment or ways of life, which may underlie the geographical distribution of the disease. Chronic cor pulmonale can be diagnosed clinically, radiologically, electrocardiographically, by Echocardiography and also by invasive techniques.

PATIENTS AND METHODS:

PLACE OF STUDY: Department of Pulmonary Medicine Alluri sita rama raju academy of Medical Sciences Eluru.

STUDY DESIGN: Analytical Cross-sectional study.
PERIOD OF STUDY: Dec 2015 to June 2017

INCLUSION CRITERIA: Presence of right ventricular hypertrophy and / or dilatation in Echocardiography along with mean pulmonary arterial pressure of ≥ 25 mm hg.

exclusion criteria: underlying heart disease (eg Rheumatic, congenital, coronary heart disease) which could have led to right ventricular failure.

STUDY POPULATION

The subjects for the study were selected from patients admitted to the medical wards of asram medical college eluru during the period from December 2015 to June 2017 who fulfilled in the criteria described above. The diagnosis of chronic corpulmonale was made on the basis of history, physical findings and echocardiographic features.

METHODOLOGY

50 patients of chronic corpulmonale who fulfilled the criteria were selected. A detailed history was obtained from them and symptom analysis was done. A detailed clinical examination was also done. A 12 lead electrocardiogram which included right sided chest leads V3 R and V4 R was obtained and analysed. A chest radiograph which comprised of a postero anterior chest film was obtained. In selected cases computerised tomogram of the chest was done. Parenchymal lesions in the lung were analyzed for which would give a clue to the underlying lung disease which caused chronic corpulmonale. Presence of pulmonary artery dilatation and other features suggestive of corpulmonale were also looked for.

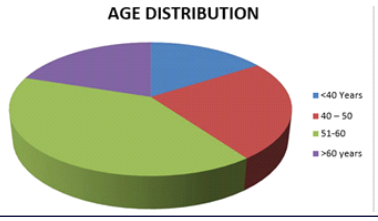
The clinical profile along with the probable etiology, radiological, electrocardiographic and Echocardiographic findings were summarised and compared between different variables.

RESULTS:

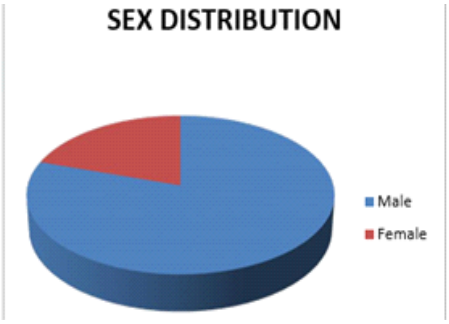
Out of these 50 patients 40 were male patients and 10 were females. The age of patients ranged from 35 to 80 years.

AGE DISTRIBUTION

In our present study the following age distribution was observed. The Distributions shows that the peak incidence was in the 5th and 6th decades. Reason for the peak Incidence in 5th and 6th decade could be most of the patients started smoking in 3rd decade. Damage to the lung occurs over a period of time which leads to peak incidence of corpulmonale in 5th and 6th decade.

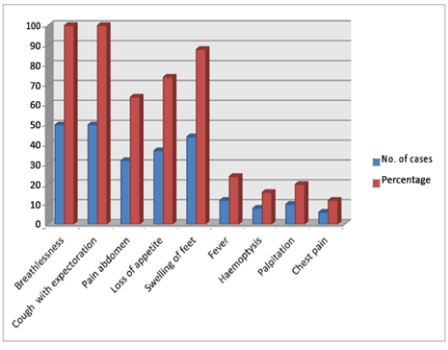


SEX:
In our study 40 patients were males and 10 patients were females. More number smokers found in male gender hence more number of corpulmonale cases were seen in male gender.

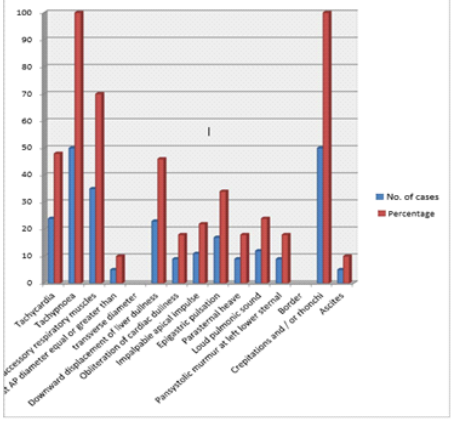


SMOKING HABITS:
In our study 38 male patients were smokers and used to smoke more than 10 cigarettes or beedies per day (ranging from 10 to 30 per day). The duration of smoking was more than 10 years in 33 cases where as in 5 cases it was less than 10 years. Incidence of corpulmonale is proportional to the amount of smoking.

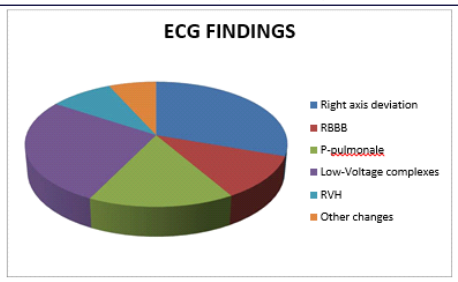
SYMPTOMATOLOGY:
All the patients with corpulmonale had breathlessness and cough. Most patients presented with pain abdomen and swelling of feet.Fever was present in 24% percent of patients whereas loss of appetite was in 74 percent; chest pain was noted in 12% and hemoptysis in 16 percent. 20 percent of patients presented with palpitation.



PHYSICAL FINDINGS:
All patients had right sided heart failure in the form of raised Jugular venous pressure, tender enlarged liver and bilateral pedal edema. Most commonly observed physical findings in our study are tachypnea, active accessory respiratory muscles, diminished chest expansion, epigastric heave, crepitations and rhonchi on auscultation and loud 2nd pulmonic sound.



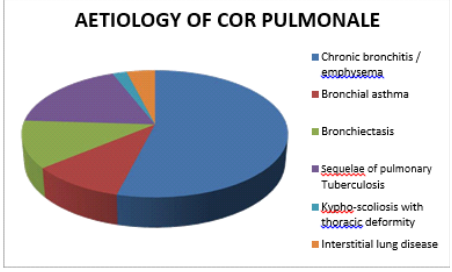
ELECTROCARDIOGRAM:
Among the 50 cases 27 (54%) cases showed evidence of right axis deviation, 24 (48%) cases showed low voltage complexes, 14 (28%) cases showed P-pulmonale and 10 (20%) cases showed right bundle branch block. Eight cases (16%) showed right ventricular hypertrophy. Six cases showed other ECG changes i.e. Ventricular ectopics (1 case), T inversion in II III AVF (4 cases), sinus tachycardia (1 case).



ECHO CARDIOGRAPHY FEATURES:
2d echocardiography in this present study showed dilated right atrium and right ventricle, Right ventricular systolic pressure and paradoxical interventricularseptal motion was taken in this study. In 50 patients' right ventricular systolic pressure of equal to or less than 40mmhg was observed in 17 patients in 33 patients right ventricular systolic pressure was greater than 40mmhg. Paradoxical interventricularseptal motion was observed in 16 patients absent in 34 Patients. Severity of right ventricular systolic pressure and paradoxical interventricular septum motion related to duration of smoking.

	Number of patients
Rvsp ≤ 40 mmhg	17
Rvsp≥ 40 mmhg	33
Paradoxical IVS present	16
Paradoxical IVS absent	34

CAUSES OF CHRONIC CORPULMONALE:
In our study the cause of chronic corpulmonale in majority of the cases was chronic bronchitis and emphysema 54%. In nine of the cases sequelae of pulmonary tuberculosis was the cause. Five cases had bronchial asthma, six cases bronchiectasis one case had kyphoscoliosis with thoracic deformity and two had interstitial lung diseases.



DISCUSSION:
Objectives of this study is To identify the peak age of onset of corpulmonle and to identify the risk factors for the development of corpulmonale ,Common symptomatic presentation of corpulmonale, Various chest x- ray findings of corpulmonale. Electrocardiographic changes of corpulmonale and to compare aetiological factors of the disease with risk factors and various clinical and radiological factors.

Among 50 patients in our study 20% were found to be females and the remaining males. Most of the study population in our present study were in the 40 to 60 year age group. The age and sex ratio in our study is comparable to the studies done previously. Shankar et al reported a similar age distribution in his study.

Mean Age of Distribution among Males is 54.2 years. Mean age of distribution among smokers (Male) is 53.55 years. Mean age of distribution among Non-Smokers (Male) 66.5 years. Mean age of distribution among Females is 47.1 years mean age of distribution among Non-Smokers is 50.33 years.

The mean age of distribution among non-smokers is higher when compared to that of smokers. Mean age distribution among females is lower when compared to that of males.

Age distribution in comparison with different studies: Most of the studies like basavaraju et al. Gupta et al and sunilbabu met,al showed peak incidence of age in the 6th decade. Reason for this could be due to cumulative damage to the lungs over decades of cigarette smoking. Most of the patients started smoking in 2nd to 3rd decade. Among other patients, diseases like bronchial asthma, bronchiectasis and interstitial lung diseases contributed to development of corpulmonale in 5th and

6th decade. One case had chest wall deformity and developed corpulmonale earlier.

SUMMARY:

1. The objective of the study was to know the etiology and clinical profile including radiological features and ECG changes in chronic corpulmonale.
2. 50 cases of chronic corpulmonale, of which 40 were males and 10 were female were included in the study.
3. Chronic corpulmonale was predominantly found to be a disease of middle and older age groups with a peak incidence in the fifth and sixth decades.
4. Smoking plays a significant role in precipitating and aggravating the primary lung disease and hence corpulmonale.
5. Thorough interrogation with reference to symptoms like breathlessness, cough with expectoration swelling of the feet etc, was done.
6. Detailed clinical examination was carried out to confirm the diagnosis of corpulmonale and to find out any associated evidence of lungparenchymallesions. Ninecaseshadsequelaeof pulmonary tuberculosis, Six cases had bilateral bronchiectasis and 5 cases had bronchial asthma 1 case had kyphoscoliosis and 2 had ILD. The remaining cases were chronic bronchitis with or without emphysema.
7. Chest X-ray was done in all cases. Chest X-ray showed details of relevant clinical profile. Thus the changes included chronic bronchitis with or without emphysema (54%), bronchiectasis (12%), Bilateral pulmonary tuberculosis with fibrosis with or without compensatory emphysema (18%). One case (2%) showed kyphoscolio sis with gross thoracic deformity. Two (4%) had reticulonodular pattern suggestive of ILD. CT scan was done in necessary cases.
8. In all the proved cases of corpulmonale by 2d echo, Electro cardiogram was recorded in all the 12 leads along with V3R, V4R. It was recorded at a speed of 25 mm/sec with standardization of 1 mv - 10 mm.
9. ECG varied between normal (only sinus tachycardia) to evidence of dominant right ventricular activity. The latter was evidenced by RVH (16%). Right Axis deviation (54%) RBBB (20%) and P – Pulmonale (28%). One case had ventricular ectopics.
10. It was observed that Response to treatment was better in patients with symptoms of lesser duration compared to patients with symptoms of longer duration.

CONCLUSION:

The major cause of chronic corpulmonale in our study was found to be Chronic Obstructive Pulmonary Disease followed by sequelae of pulmonary tuberculosis. Smoking formed the major and most important causal association in the present study.

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