

Original Research Article

Etiology and clinical profile in chronic cor pulmonale

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ABSTRACT

Background: Cor pulmonale is a synonym for pulmonary heart disease. The term “cor pulmonale” if broken into its constituents “cor” (heart) and “pulmo” (lungs), means cardiac involvement due to pulmonary diseases. Chronic cor pulmonale is not a single disease entity but resulting secondary to many bronchopulmonary vascular diseases and also from thoracic cage abnormalities. Cor pulmonale accounts for 5-10% of all heart diseases, 20-30% of all admissions for heart failure and 9.2% in the cardiac autopsies.

Methods: This was a hospital-based study carried among patients diagnosed with chronic cor pulmonale admitted to the medical wards of Karnataka institute of medical sciences, Hubli. during December 2011- November 2012 using simple random sampling method.

Results: The following observations were made in 50 representative cases the age group of patients was between 24 to 85 years. Chronic cor pulmonale was commonly seen in middle and elderly age groups. Incidence below 35 years is very less. Almost every patient of chronic cor pulmonale presented with breathlessness and cough. All patients in the study had Tachypnoea, Diminished chest movements, Prominent use of accessory muscles of respiration, Cyanosis, Clubbing (in some patients), Crepitations and rhonchi on chest auscultation, Loud P2 and pansystolic murmur in Tricuspid area on cardiac auscultation.

Conclusions: The peak incidence of chronic cor pulmonale was found to be in the middle and older age groups with high incidence during winter season. Smoking and dusty environment at the site of occupation were aggravating the primary lung disease. Breathlessness, cough and edema of the feet were the most common symptoms.

Keywords: Breathlessness, Chronic cor pulmonale, Clinical profile, Etiology

INTRODUCTION

Cor pulmonale is a synonym for pulmonary heart disease. The term “cor pulmonale” if broken into its constituents “cor” (heart) and “pulmo” (lungs), means cardiac involvement due to pulmonary diseases. Chronic cor pulmonale is not a single disease entity but resulting secondary to many bronchopulmonary vascular diseases and also from thoracic cage abnormalities. Cor pulmonale accounts for 5-10% of all heart diseases, 20-30% of all admissions for heart failure and 9.2% in the cardiac autopsies.¹ the association of heart failure with chest diseases was not recognized until the beginning of 20th

century. The term cor pulmonale was first introduced into the medical literature by White (1930). Prior to that it was generally known as emphysema heart, pulmonary heart disease, Ayerzas disease and rather eloquently ‘Black Cardiacs’.² According to Emmanuel et al, best definition of cor pulmonale is pulmonary artery hypertension resulting from diseases affecting the structure and/or function of lungs. Clinically cor pulmonale is classified depending on the onset of the disease into - Acute, Sub acute and Chronic.

The most important nonmalignant lung disease caused by cigarette smoke is chronic obstructive lung disease, a

globally escalating problem that mirrors the extent of cigarette smoking in the community.³ Odds ratio for COPD was higher for men, elderly individuals, lower socio-economic status and urban or mixed residence. Environmental Tobacco Smoke (ETS) exposure among non-smokers had an odds ratio of 1.4. Combined exposure to both ETS and solid fuel combustion had higher odds ratio than for ETS exposure alone.⁴

The incidence of COPD is higher in heavily industrialized urban areas. Episodes of exacerbation of COPD correlate with periods of heavy pollution with Sulphur dioxide and particulate matter. In India, indoor pollution caused by burning of cow dung cakes and use of wood for cooking is an important contributory factor. Increased pulmonary vascular resistance and pulmonary hypertension are central mechanisms in all cases of cor pulmonale.⁵

Hence the present study was undertaken with the objective of studying the etiology and clinical profile of patients with Chronic Cor Pulmonale.

METHODS

The subjects for the study were selected from the cases admitted to the medical wards of Karnataka institute of medical sciences, Hubli. during the time period December 2011-November 2012. Fifty representative cases were selected by simple random sampling method for the study. On the basis of patient’s history, physical findings, the diagnosis of chronic cor pulmonale was made. Each case taken for the study was subjected to echocardiography.

Inclusion criteria

- All patients were included in the study with chronic cor pulmonale of both the genders as cases. The diagnosis of chronic cor pulmonale was established by Clinical history with cough with sputum, paroxysmal cough, dyspnea, fluid retention with edema and sometimes ascites, recurrent chest infections, cyanosis, fatigue, chest pain, near syncope, palpitation. General physical examination suggesting signs of Right ventricular failure.

Exclusion criteria

- Patients with primary involvement of left side of the heart, valvular or myocardial disease, arterial occlusive disease from emboli, primary pulmonary hypertension, congenital heart disease, congenital heart diseases with reversal of shunt.

RESULTS

The following observations were made in 50 representative cases of chronic cor pulmonale. The age group ranged between 24 to 85 years in the study group.

Chronic cor pulmonale is commonly seen in middle and elderly age groups. Incidence below 35 years is very less. In the present study 31 patients were male and 18 patients were females. Majority of patients were Agriculturist, 29 patients were smokers, and all were males, who used to smoke at least 10-12 beedis per Day. The duration of smoking was more than 10 years in 27 cases and less than 10 years in 2 cases. Almost every patient of chronic cor pulmonale presented with breathlessness and cough. Many patients had pedal edema and distension of abdomen (Table 1).

Table1: Etiological factors for chronic cor pulmonale.

Etiological Factors	Variable	%
Smoking duration	< 10 yrs	4
	11-20 yrs	32
	21-30 yrs	8
	>30 yrs	14
Cause	Chronic bronchitis and emphysema	60
	Pulmonary TB	22
	Bronchiectasis	6
	Bronchial asthma	8
	ILD	2
	Left lung collapse	2

Table 2: Signs and symptoms of chronic cor pulmonale.

Characteristics	Variable	%
Symptoms	Breathlessness	100
	Cough with expectoration	90
	Peripheral edema	100
	Distension of abdomen	38
	Chest pain	30
	Haemoptysis	4
	Fever	16
Signs	Tachypnoea	100
	Tachycardia	20
	Cyanosis	40
	Clubbing	8
	Diminished chest movements	36
	Prominent use of accessory muscles	84
	Barrel shaped chest	36
	Crepitations and rhonchi	100
	Parasternal heave	26
	Loud P2	42
	Signs of TR	38
	Obliteration of cardiac dullnes	14
	Obliteration of liver dullness	30
Ascites	40	

All patients in the study had features suggestive of right heart failure the physical findings noticed in this study were Tachypnoea, Diminished chest movements,

Prominent use of accessory muscles of respiration, Cyanosis, Clubbing (in some patients), Crepitations and rhonchi on chest auscultation, Loud P2 and pansystolic murmur in Tricuspid area on cardiac auscultation. In this study, causes of chronic cor pulmonale in majority of cases were chronic bronchitis and emphysema which was 60%, pulmonary tuberculosis was the cause in 22% of cases, bronchial asthma in 8%, bronchiectasis 6%, left lung collapse was seen in 2% of cases (Table 2).

DISCUSSION

The present study on chronic cor pulmonale can be discussed and compared under the following criteria. In the present study the peak incidence was found to be in the 4th, 5th and 6th and 7th decades of life and the age distribution is very well comparable with that of cases studied by Shankar et al, and K.Vishwanathan.^{6,7} In the present study we also found that the incidence of cor pulmonale below the age of 40 was also increasing. This can be attributed due to environmental pollution, Tuberculosis as well as smoking habit earlier in life.

In this study, among 50 cases, 31 were males and 19 were females. In the present study 29 were smokers and all were males. Various statistical studies have shown that chronic cor pulmonale is more common in males than in females. A study done by R Vishwanathan showed cor pulmonale was more common in males compared to females.⁸ In study done by J C Banerjee out of 75 cases, 60 were males and 15 were females.⁹ This difference in sex distribution is mainly due to smoking in males.

Bronchial asthma and chronic bronchitis are the main causes for the development of chronic cor pulmonale which were closely related to the patient's occupation. In the present study majority of the patients were agriculturists (21%) and coolie workers (6%). A study conducted by R Vishwanathan showed that 66 patients out of 130 patients had exposure to smoke from fireplaces in which cow dung cake along with firewood or coal were burnt. Smoke is no doubt a possible source of atmospheric pollution which can produce bronchial irritation in susceptible individuals.

Indoor air pollution as a cause for COPD should also be considered.¹⁰ Smoking takes the credit as one of the major causative factor for COPD which results in chronic cor pulmonale. In the present study, 29 (58%) male patients were smokers who used to smoke at least 10-12 beedis per day. The importance of smoking as a causative factor is well established in all the studies and various surveys conducted in United States and Great Britain Majority of patients in the study group presented during the winter months of the year.

The exacerbations especially chronic bronchitis occurs in winter months and they precipitate the onset of heart failure in cases which have developed chronic cor pulmonale.¹⁰

In the present study all the patients presented with breathlessness and 95% presented with cough. All the patients had peripheral edema and 40% had distension of the abdomen.

According to Padmavathi, Stuart and Kamath series breathlessness, cough, abdominal distension and peripheral edema were the chief presenting complaints.¹⁰ Whereas K Vishwanathan study showed cough and edema were the predominant symptoms.⁸ Signs of right heart failure was present in all the patients in the study, suggesting the presence of chronic cor pulmonale .

In this study, chronic bronchitis and emphysema was leading cause for chronic cor pulmonale. In the study by K Vishwanathan, 76.9% of patients had chronic bronchitis with emphysema. Study done by Banerjee showed 60.6% of the patients had chronic cor pulmonale and emphysema as the cause for cor pulmonale. Study done by Kamath showed 62% had chronic bronchitis with or without emphysema.

Study by Padmavathi showed that 50.8% patients had chronic bronchitis with or without emphysema. In the present study chronic bronchitis with emphysema was the cause in 60% of cases thus correlating with other studies.

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