Original Article

A study of echocardiographic changes in patients with chronic corpulmonance

Gnan Abhinesh M[1*], Chandrashekar[2]

[1,2]Department of Medicine, Vijayanagar Institute of Medical Sciences, Ballari, Karnataka, INDIA.
Email: abhinesh87@gmail.com

Abstract

Introduction: Corpulmonale is a synonym for pulmonary heart disease. It is traditionally defined as the right ventricular failure secondary to disorders that affect either the structure or function of the lungs. **Aims and Objectives:** To Study of Echocardiographic Changes In Patients with Chronic CorPulmonance. **Methodology:** The present study was conducted in Navodaya Medical College Hospital and Research Centre between January 2013 to December 2013, on patients selected from casesadmitted to medical wards. In the present study 50 patients selected from medical wards both male and female between 30 to 80 years suffering from chronic corpulmonale were evaluated with routine echo cardiography. All patients were subjected on admission to Two-dimensional echocardiography was done with ultrasound machine using 3.5 M Hz transducer. Recording was done in parasternal long axis view. **Result:** In the present study, majority of the patients were between 40 – 69 years and the mean age group was 55.3years.Male to female ratio observed was 11.5: 1.Right ventricular internal diameter at end systole (RVIDED) was in between the range of 3.4-4.0 cm in majority of the patients. The mean RVIDED is 3.7cm. **Conclusion:** On Echo the Right ventricular internal diameter at end systole (RVIDED) was found to be increased in Corpulmonale patients.

Keywords: Echocardiography, CorPulmonance**,** Right ventricular internal diameter at end systole (RVIDED).

[*]**Address for Correspondence:**
Dr. Gnan Abhinesh M, Department of Medicine, Vijayanagar institute of Medical Sciences, Ballari-583103, Karnataka, INDIA.
Email: abhinesh87@gmail.com

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INTRODUCTION

Corpulmonale is a synonym for pulmonary heart disease[1]. It is traditionally defined as the right ventricular failure secondary to disorders that affect either the structure or function of the lungs. Routine mortality statistics compiled according to the international classification of diseases cannot at present provide information on the frequency of corpulmonale as this condition is not properly identified there, being allocated to the residual category "434.4 unspecified disease of heart".[1] Chronic corpulmonale is recognized as a serious protracted, ultimately fatal human experience consuming frequently a large segment of the sufferer's life. This disease has remained so long unrecognized is due probably to a number of causes. For many years the diagnosis was not made. The condition was obscured in the accompanying pulmonary manifestations on the one hand, and was identified on the other hand as some other form of heart disease. Physiologists are only now in the process of simplifying these principles and methods of diagnosis so that physician can add them to this clinical analysis[11]. The wide disparities in the reported incidence of the disease in different areas may simply reflect these inconsistencies in the diagnostic terminology and conventions[4]. So far as hospital admissions are concerned, high figures for the incidence of corpulmonale among hospital admission for heart failure ranging from 16% to 38% have been reported from places such as Belgrade, Delhi, Prague and Sheffield. In most reported series more than 50% of cases are attributed to chronic bronchitis, asthma or emphysema, which constitute an ill-defined group of diseases at uncertain aetiology2. So it is apparent that chronic corpulmonale is of clinical significance of serious problem in public health and preventive indicence.[1,2,4]

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MATERIAL AND METHODS

The present study was conducted in Navodaya Medical College Hospital and Research Centre between January 2013 to December 2013, on patients selected from cases admitted to medical wards. In the present study 50 patients selected from medical wards both male and female between 30 to 80 years suffering from chronic corpulmonale were evaluated with routine echo cardiography. LV dysfunction, Valvular heart disease, Known coronary artery disease, Active pulmonary tuberculosis, Poor echogenic window were excluded from the study. An informed consent was taken from the patients and the college ethical committee approved the study. All patients were subjected on admission to Two-dimensional echocardiography was done with ultrasound machine using 3.5 M Hz transducer. Recording was done in parasternal long axis view. The right ventricular internal diameter in end diastole (RVIED) and presence or absence or attenuation of 'a' wave was studied. Depth of 'a' wave indicates the mean PAP. If depth of 'a' wave is less than 2 mm, the mean PAP is usually more than 20 mm Hg.

RESULTS

Table 1: Age distribution of chronic corpulmonale Patients

Age distribution (years)	Number of patients	Percentage
30 – 39	9	18
40 – 49	10	20
50 – 59	6	12
60 – 69	18	36
70 – 79	7	14

In the present study, 50 cases of chronic corpulmonale were studied. The observation made during the study is presented below with an analysis of the same. In the present study, majority of the patients were between 40 – 69 years and the mean age group was 55.3years.

Table 2: Sex Distribution of Chronic CorPulmonale

Sex	Number of Patients	Percentage
Male	46	92
Female	4	8

Thus, in the present study, male to female ratio observed was 11.5: 1.

Table 3: Echocardiogrpahy of chronic corpulmonale

RVIDED (cm)	Number of patients	Percentage
2.3-2.8	0	0
2.9-3.3	6	12
3.4-3.8	25	50
> 3.8	19	38

In the present study the Right ventricular internal diameter at end systole (RVIDED) was in between the range of 3.4-4.0 cm in majority of the patients. The mean RVIDED is 3.7cm.

DISCUSSION

In Echocardiography[12,13,14,15] Hyper inflation increases the retrosternal air space, which therefore transmits sound waves poorly, making echocardiography difficult in patients with COPD. It allows the measurement of thickness of RV wall and although volume changes cannot be measured, this technique can show enlargement of the RV cavity in relation to that of LV.[13,14] M-mode echocardiography can show abnormal motion of the pulmonary value. Delayed opening of the valve, mid systolic closure and an increase in the ratio of the pre-ejection time to total ejection time have been reported in patients with pulmonary hypertension. The interval between the onset of RV ejection and peak velocity known as the time to peak velocity, correlates fairly with mean pulmonary artery pressure in patients with COPD.[15] 2-D echocardiography is useful in excluding left sided heart disease as a cause of pulmonary hypertension and RV enlargement. Right ventricular dimension and wall thickness can be assessed by using left parasternal view or apical four-chamber view.[14] The increased right ventricular end diastolic diameter (RVIDED) and right ventricular anterior wall thickness (RVAWT) correlate well with raised pulmonary artery pressure as assessed by pulmonary artery catheterization.[13] Doppler echo cardiography can assess the velocity of tricuspid regurgitant blood flow, when used in Bernoulli's equation can be used to determine the right ventricular atrial pressure gradient. When this is added to the right atrial pressure, which is assessed clinically, the pulmonary artery systolic pressure can be determined.[12,13] In the present study, 50 cases of chronic corpulmonale were studied and important factors, which would have influenced the study otherwise, is mentioned below.5 Age: In the present study the mean age was 55.3 years whereas Padmavathi and Misra (1959) noticed maximum incidence between 40-49 years.[17] Guptha *et al*. (1989) reported a mean age of 50.2±12 years[18]. Sex: In the present study male accounted for 92% and male to female ratio was 11.5:1. Padmavathi (1959) [2] 54 % Male and 46**%** Female**.** In the present study on 2 D Echo, the Right ventricular internal diameter at end systole(RVIDED) was in between the range of 3.4-4.0 cm in majority of the patients. The mean RVIDED is 3.7cm.

CONCLUSION

On Echo the Right ventricular internal diameter at end systole (RVIDED) was found to be increased in Corpulmonale patients.

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