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Echocardiographical Evaluation and Cardiovascular Changes in Patients Admitted in ICU with Acute Respiratory Failure of Various Etiology in Tertiary Care Hospital

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Abstract
Introduction: *Acute respiratory failure is a life-threatening condition characterized by an inability to maintain normal levels of oxygen and/or carbon dioxide due to dysfunction of the respiratory system. Cardiac and respiratory systems are dependent. The study aimed to assess the prevalence of echocardiographic abnormalities in patients presented with Acute Respiratory Failure of various Etiology.*
Materials and Methods: *A total of 108 patients of Acute Respiratory Failure of various Lung diseases were enrolled in the present study. All patients were subjected to full medical history and clinical examination, chest radiography, ABG, complete blood count, 2D-echocardiography.*
Results: *108 patients included in our study, 64(59.3%) were male and 44(40.7%) were female. Mean age was 61.28 ± 11.30 years. Out of 108 patients studied, 77 patients(71.3%) belongs to Chronic Obstructive Pulmonary Disease(COPD) group, followed by 17 patients(15.7%) of pneumonia, followed by 4 patients(3.7%) of Obstructive Sleep Apnea(OSA), followed by 3 patients(2.8%) of Interstitial Lung Disease (ILD), followed by 2 patients(1.9%) of Acute Respiratory Distress Syndrome(ARDS) and 5 patients(4.6%) of other category, which includes case of bronchial asthma, bronchiectasis, fibrocavitatory disease and Rheumatic Heart Disease(RHD).*
Out of 108 patients studied, Cor pulmonale was the most common cardiac abnormality present in 39 patients(36.1%), followed by Coronary Artery Disease(CAD) was present in 3 patients(2.8%), followed by Dilated Cardiomyopathy(DCMP) and Mild Pulmonary Artery Hypertention (PAH) was present in 2 patients(1.9%) each and one patient(0.9%) had RHD.
Conclusion: *Echocardiography is helpful in early detection of cardiac complications and Cardiac disease in Patients presented with Aute Respiratory Failure.*
Key Words: *COPD, cor pulmonale, CAD, DCMP.*

INTRODUCTION

Acute respiratory failure is a life-threatening condition characterized by an inability to maintain normal levels of oxygen and/or carbon dioxide due to dysfunction of the respiratory system. Cardiac and respiratory systems are dependent. For example, [1] a bout of pneumonia is sufficient to trigger an acute exacerbation of heart failure, [2] a reduction in cardiac output accompanying septic shock is a cause of ARF caused by diaphragm hypoperfusion leading to alveolar hypoventilation, and respiratory arrest.

In this study most patients belongs to COPD group which admitted to ICU with AE of COPD and most common cardiovascular change in COPD is Cor pulmonale.

The cardiovascular sequelae of chronic obstructive pulmonary disease (COPD) have been recognized for decades.[1]

Pulmonary vascular disease associated with COPD increases morbidity and worsens survival.[2,3,4,5,6,7]

The study aimed to assess the prevalence of echocardiographic abnormalities in patients presented with Acute Respiratory Failure of various Etiology.

MATERIAL AND METHODS

A total of 108 patients of Acute Respiratory Failure of various Lung diseases were enrolled in the present study. The study was conducted in Deparment of Respiratory Medicine, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, U.P.

All patients were subjected to full medical history and clinical examination, chest radiography, ABG, complete blood count,2D-echocardiography.

RESULT

The study was carried out on 108 subjects who were admitted in ICU/HDU with Acute Respiratory Failure.

Table 1: Distribution of patients according to Age

Age Groups	Frequency	%
<=40 yrs	3	2.8%
41 - 50 yrs	16	14.8%
51 - 60 yrs	32	29.6%
61 - 70 yrs	34	31.5%
>70 yrs	23	21.3%
Total	108	100%
Mean ± SD	61.28 ± 11.30	
Min - Max	18 – 85	

The table shows the frequency and percentage distribution according to age. It was observed that 31.5% of the patients were under the age group 61-70 years followed by 29.6% of the patients in 51-60 years, 21.3% in >70 years, 14.8% in 41-50 years of age group and 2.8% in <=40 years. It was observed that the mean age of the group was 61.28 ± 11.30 years.

Table 2: Distribution of patients according to disease

Diagnosis	Frequency	%
COPD	77	71.3%
Pneumonia	17	15.7%
OSA	4	3.7%
ILD	3	2.8%
ARDS	2	1.9%
Others	5	4.6%
Total	108	100%

The table shows the frequency and percentage distribution according to disease. Out of 108 patients studied, 77 patients(71.3%) belongs to COPD group, followed by 17 patients(15.7%) of pneumonia, followed by 4 patients(3.7%) of OSA, followed by 3 patients(2.8%) of ILD, followed by 2 patients(1.9%) of ARDS, and 5 patients(4.6%) of other category.

Table 3: Distribution of patients according to 2D-Echo finding

2D ECHO	Frequency	%
None	61	56.4%
Corpulmonale	39	36.1%
CAD	3	2.8%
DCMP	2	1.9%
Mild PAH	2	1.9%
RHD/SEVERE MR/TR	1	0.9%

The table shows the frequency and percentage distribution of 2D-Echo finding. Out of 108

patients studied 61 patients (56.4%) had normal 2D-Echo finding, followed by Corpulmonale seen in 39 patients (36.1%), followed by CAD seen in 3 patients(2.8%), followed by DCMP and Mild PAH in 2 patients(1.9%), and RHD was present in 1 patient(0.9%).

DISCUSSION

The study was carried out on 108 subjects who were admitted in ICU/HDU with Acute Respiratory Failure.

Out of 108 patients, 64(59.3%) were male and 44(40.7%) were female. Mean age was 61.28 ± 11.30 years.

Out of 108 patients studied, 77 patients(71.3%) belongs to COPD group, followed by 17 patients (15.7%) of pneumonia, followed by 4 patients (3.7%) of OSA, followed by 3 patients(2.8%) of ILD, followed by 2 patients(1.9%) of ARDS and 5 patients (4.6%) of other category, which includes case of bronchial asthma, bronchiectasis, fibrocavitatory disease and Rheumatic Heart Disease.

Out of 108 patients studied, Corpulmonale was the most common cardiac abnormality present in 39 patients(36.1%), followed by CAD was present in 3 patients(2.8%), followed by DCMP and Mild PAH was present in 2 patients(1.9%) each and one patient(0.9%) had RHD.

CONCLUSION

To conclude, Echocardiography is helpful in early detection of cardiac complications and Cardiac disease in Patients presented with Aute Respiratory Failure.

High prevalence of Cardiac disorders mainly Cor pulmonale complicating Respiratory diseases, more so with COPD. The screening must to be done in all patients to rule out cardiac complications. This would contribute to the assessment of prognosis in these patients and assist in identifying individuals likely to suffer increased mortality and morbidity warranting close monitoring and intense treatment.

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