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Clinical Profile of Patients Presented with Dyspnea in Medical Emergency Ward

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ABSTRACT

Acute dyspnea is one of the major causes of consultation in emergency departments and is the cardinal symptom of most cardiac and respiratory diseases The aims of this study were therefore to study etiological, clinical biochemical and radiological profile of patients presenting with dyspnea at Guru Govindsingh Hospital Jamnagar and to find out risk factors associated with adverse outcomes of these patients that will guide treating physician to early diagnosis and treatment and to reduce complications.

KEYWORDS: Low output dyspnea, gas exchanger, ARDS

INTRODUCTION:

Dyspnea is the chief complaint for about eight percent calls to the ambulance service, and is the third most common type of emergency calls.[1]

A better understanding of the mechanisms, assessment, and treatment of dyspnea is necessary if clinicians are to improve their ability to monitor and treat patients with shortness of breath. Scoring tools have been developed to assist the clinician in the assessment.[2,3] It should be noted that while hyperventilation and dyspnea frequently coexist, this relationship is not absolute.[4] There is scanty knowledge of the presentation, clinical characteristics and outcomes of acute dyspnea.

Furthermore, two studies suggested that prognosis was improved when early diagnostic and treatments were accurate[5,6] Behavioral aspects and emotional state also impact important influences on the expression of respiratory sensations. Further studies are necessary to better delineate and clarify the physiologic and psychologic components underlying dyspnea of confirm a justified approach to the treatment of this symptom. Which approach for managing dyspnea should be used? The solution to this question is nothing but individualization.

MATERIALS & METHODS

This prospective cross sectional observational study was carried out to know the pattern of patients presenting with complaint of dyspnea.

Aims and Objective :

A] To study etiological, clinical, biochemical and radiological profile of patients Presenting with dyspnea in medical emergency ward.

B] To find out risk factors associated with adverse outcomes of these patients

Sample size and method – All Consecutive number of patients presenting with dyspnea in the study duration with inclusion criteria.

A) Inclusion criteria:

Dyspnea of < 1week in patients of both sex with age>12 with any one of the following…..
Respiratory rate >22,
Spo2 less than 94% in breathing room air,
Hemodynamic instability,
Finding of wheezing on auscultation.

B) Exclusion criteria:

Those patients who did not require admission or who were not ready for admission, hence has outpatient basis treatment and those of admitted in hospital who expired is less than 4 hours for whom there was no time period for laboratory evaluation.

RESULTS:

In the study duration 25,540 patients visited ED of which 2420(9.47%) came for breathlessness of which 231 (9.54%) patients satisfied the inclusion criteria, and 192 patients were pursued till discharge. Out of that 110(57.29%) had respiratory rate>22 per minute, 136 (70.83%) has spo2<94% at room air,114 (59.37%) has homodynamic instability, 60 (31.25%) had metabolic acidosis on ABG, 34 (17.70%) has wheezing on auscultation, 23 (11.97%) has Pco2>50..

107 (55.72%) were males and 85 (44.27%) were females, the M:F ratio being 1.25:1.

Fever (38.02%) was the commonest symptom followed by cough (37.5%), chest pain (30.2%), oliguria (15.62%), orthopnea (15.10%) and altered senses(11.97%).

Fever, chest pain, hemoptysis & bleeding altered senses jaundice and headache were related to outcome ($p<0.05$)

Smoking (17.7%) was largest comorbidity followed by hypertension (15.62%), tobacco chewing (15.10%) and alcoholism (11.45%).

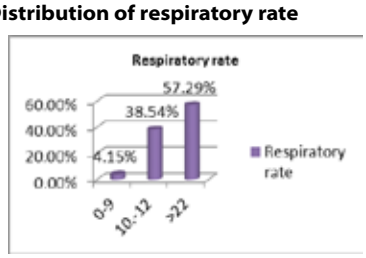
Only chronic kidney disease was related to mortality significantly ($p=0.008$).

Largest etiological subgroup was congestive heart failure (20.83%), followed by pneumonia (19.27%), metabolic acidosis (17.7%), myocardial ischemia (15.10%) and COPD (11.97%), severe anemia(9.89%)

Anemia (53.12%) was the commonest other system abnormality, followed by leucocytosis / leucopenia (34.37%) followed by hypertension (24.47%). 37 (19.27%) patients has no other system abnormality.

Bradypnea was present in 8 patients(4.16%), tachypnea in 110 patients (57.29%); while normal respiratory rate in 74 patients (38.54%) .

Figure 1: Distribution of respiratory rate



On chest x-ray, 56 (29.16%) patients had normal appearance, fallowed by cardiomegaly (39 patients, 20.31) consolidation (29 patients, 15.10%) On ECG commonest finding was normal electrocardiogram(58 patients, 30.20%), sinus tachycardia (57 patients, 29.68%), ST segment depression (46 patients, 23.95%) .

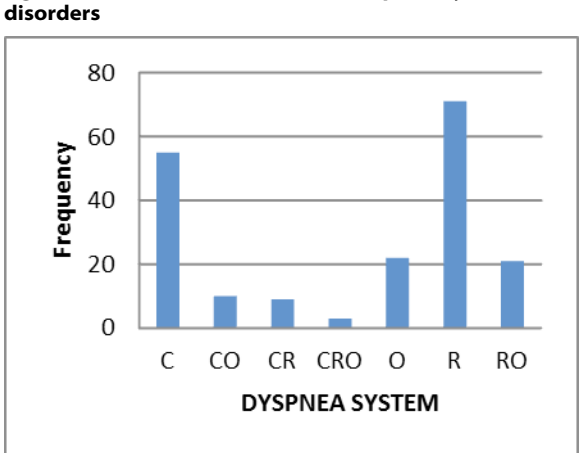
Largest etiological group was CHF (20.83), pneumonia(19.27), COPD(11.97), Severe anemia(9.89%), pleural effusion (9.89%), ARDS (6.25%), acute asthma (5.72%), aspiration (3.64%). Mortality percentages were higher for pulmonary hemorrhage (100%), ARDS (58.3%), metabolic acidosis (38.2%), obesity (36.4%), pulmonary embolism (33.3%), pericardial disease (33.3%), alcoholic liver disease (33.3%), severe anemia (31.6%).

Table – 1 : Etiological diagnoses and outcome

Diagnosis	Total %	Mortality %	Outcome of diagnosis (significance)
Pulm. Embolism	1.56	33.3	0.31
Pneumonia	19.27	16.2	0.5
ILD	0.52	0	0.69
COPD	11.97	13	0.94
Asthma	5.72	18	0.64
Kyphoscoliosis	0.52	0	0.69
Pregnancy	0.52	0	0.69
metabolic acidsis	17.70	38.2	0.00
CHF	20.83	5	0.076
Myocardial ischemia	15.10	3.4	0.85
Pericardial disease	3.12	33.3	0.15
Severe Anemia	9.89	31.6	0.015
ARDS	6.25	58.2	0.00
Pleural Effusion	9.89	0	0.69
Pulm. Vascular Disease	0.52	0	0.69
Psychogenic	0.52	0	0.69
Alcoholic liver disease	1.56	33.3	0.31
Aspiration	3.64	28.6	0.23
Obesity	5.72	36.4	0.023

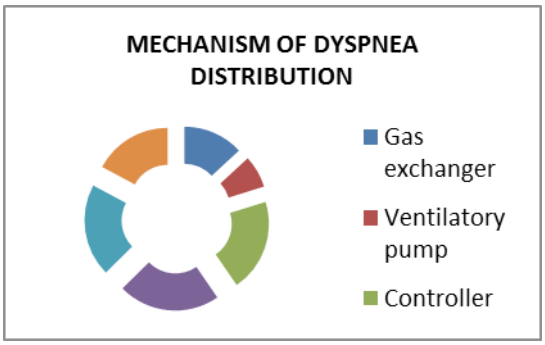
Out of 192 patients, 55 (28.65%) patients has pure cardiac cause, 72(37.5%) patients has pure respiratory disease and 22 (11.46%) has other than cardiorespiratory cause for dyspnea. Out of rest 9 (4.69%) had cardiorespiratory overlap; 10 (5.21%) patients had cardiac and other systems overlaps; 22 (11.46%) patients has respiratory other systems overlap; and 2 (1.04%) patients has all cardiorespiratory and other causes with overlap.

Figure 2: Distribution of cardiac, respiratory and other disorders



Overall low output dyspnea was commonest mechanism of dyspnea, Gas exchanger and controller has statistically significant correlation with outcome i.e. mortality (p=0.001 and 0.00 respectively).

Figure 3 distribution of various mechanisms dyspnea.



Age group wise gas exchanger decreased with increasing age (p=0.000)& low output increased with increasing age (p=0.00). while rest ventilator pump (p=0.44), controller (0.66), normal output (p=0.12), high output (0.36) did not have statistically significant correlation with age.

Heart rate and respiratory are were not statistically related to outcome (p=0.08 & 0.98 respectively).
Out of lab parameters total leucocyte count was not related statistically with outcome but platelet count, creatinine, total bilirubin, glass gow coma scale, spo2, bicarbonate level, pH, and pco2 was related statistically with outcome. (p=0.00)

Table 2 : Frequency distribution of organ failures and their outcomes.

Total	Valid cases	expired	Pvalue
Platelet<0.5 lakh	17(8.85%)	7	0.00
HB <7 gm/dl	19(9.89%)	6	0.15
Creat>5 mg/dl	26(23.54%)	13	0.00
GCS<8	17(8.85%)	14	0.00
T.Bill.>10mg/dl	11(5.72%)	9	0.00

DISCUSSION:

There is very limited resource in this context. Similar study conducted by Ray et al[7] included patients with acute dyspnea of upto two weeks duration with age at least 65 years. The age groups of this study and inclusion criteria are different. Also they aimed different outcomes; therefore comparison of variables is liable to have disparities

Table 3 Comparison of two studies in relation to presence of dyspnea

Correlation	Result of this study	Eriksson et al[225]
Equivalents	61-70 years age group has maximum number of patients i.e. 40(20.83%)	The prevalence of dyspnea grade 2 or more was increased with age from 3% at age 50 to 10% at age 67.
Disparities	Scoring of grades was not done due to subjective variations in perception of dyspnea.	Dyspnea grade 1 was less age dependent

Due to possibility of observer bias in detection of clinical signs and more easy availability of laboratory service this study did not considered the signs for analysis. Early diagnosis can be made by the physician who retains a high index of suspicion and who is aware of the clinical situation in which respiratory failure is likely to be a complication. It is important to remember that respiratory failure can exist without the presence of cyanosis. X-ray chest is one of the most useful diagnostic investigations in emergency care. Some conditions like ARDS, sequelies of previous diseases like pulmonary Koch's Early findings of other entities like pulmonary edema can be picked up by trained eyes.

Electrocardiogram is useful, easily available investigations which directly points out lethal diseases like myocardial infarction, arrhythmias.

Our study demonstrated an in-hospital mortality of 13.54%,with a higher mortality in patients with pulmonary hemorrhage (100%) ARDS (58.3%), metabolic acidosis (38.2%), alcoholic liver disease (33.3%),

severe anemia (31.6%).which had significant relation to mortality ($p<0.05$).

Finally the significant observations were that acute dyspnea is presenting symptom of various etiologies.

- Having co morbidity of chronic kidney disease was related to mortality significant.
- Out of symptoms other than dyspnea, Fever, chest pain, hemoptysis and bleeding other than hemoptysis, altered senses, jaundice and headache were related to outcome.
- Number of patients having basal dyspnea increased with the age groups in decade; Hemodynamic instability was present in majority of patients.
- Overall creat>5 was commonest organ failure; 13.54% patients were expired; Outcome was independent of age, age groups, sex, duration of dyspnea but systolic and diastolic blood pressure was related to outcome; Heart rate and respiratory rate were not statistically related to outcome. Within all lab parameters total leucocyte count was not related statistically with outcome but, platelet count, creatinine, total bilirubin, glass gow coma scale, spo2, bicarbonate level, pH, and pco2 was related statistically with outcome;
- Largest etiological subgroup was congestive heart failure, followed by pneumonia, metabolic acidosis, myocardial ischemia and COPD; only metabolic acidosis, ARDS, pulmonary hemorrhage, severe anemia and obesity had significant relation to mortality;
- Also prevalence of pneumonia decreased with age and that of COPD, congestive heart failure, myocardial ischemia increased with age while ARDS was prevalent in young age group; Sex was not related to diagnosis
- Respiratory component was (54.16%) most common; Cardiac and respiratory systems contributing to dyspnea varied with; out of systems contributing to dyspnea, Cardiac and respiratory systems contributing to dyspnea has no relation with outcome i.e. mortality, but other systems has significant relation to outcome;
- Overall low output dyspnea was largest mechanism of dyspnea; Gas exchanger and controller has statistically significant correlation with outcome i.e. mortality; Gas exchanger and low output has statistically significant ($p<0.05$) correlation with age groups in decades; Age group wise gas exchanger mechanism decreased with increased age and low output increased with increased age; Sex did not have statistically significant correlation with any of the mechanisms of dyspnea. Amongst different mechanisms / pathophysiologies of dyspnea, Gas exchanger and controller mechanism had statistically significant correlation with outcome;
- Out of other organ failures platelet count less than 0.5 lakh, creatinine greater than 5 mg%; glass gow coma scale less than 8, total bilirubin greater than 10mg% were related with outcome, haemoglobin less than 7 gm% was not related with outcome.

CONCLUSION:

In triage of patients with acute dyspnea, physicians should individualize patients and take into account following risk factors associated with higher mortality:

- Co-morbidity of chronic kidney disease.
- Symptoms Fever, chest pain, hemoptysis and, altered senses, jaundice..
- Tachycardia, Low systolic or diastolic blood pressures
- Anemia, thrombocytopenia, deranged glass gow coma scale, low spo2, low bicarbonate, low pH, high creatinine, high bilirubin and hypercapnia
- Diagnosis of metabolic acidosis, ARDS, pulmonary hemorrhage, severe anemia and obesity.

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