Original Research Article

Clinical profile of Acute Respiratory Distress Syndrome (ARDS) in ICU admitted patients

Sapkal Harish Barsu

Assistant Professor, Department of Medicine, Government Medical College, Nagpur, Maharashtra, INDIA.
Email: harishsapkal2012@gmail.com

Abstract

Background: There are so many critical cases of ARDS admitted in ICU. And there are various different causes of ARDS. There is a rising incidence of ARDS in ICU admitted patients. It is important to identify and control predisposing risk factors at an early stage to prevent the mortality. **Aim:** To study the clinical profile of Acute Respiratory Distress Syndrome admitted in ICU. **Material and Methods:** Patients aged 13 years or above admitted in ICU with a diagnosis of ARDS were studied for clinical presentations, risk factors and management outcome
Key Word: Acute Respiratory Distress Syndrome.

*Address for Correspondence:
Dr Sapkal Harish Barsu, Assistant Professor, Department of Medicine, Government Medical College, Nagpur, Maharashtra, INDIA.
Email: harishsapkal2012@gmail.com
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INTRODUCTION

In critically ill patients ARDS is a common cause of mortality due to respiratory failure, and is defined by the acute onset of noncardiogenic pulmonary edema, need for mechanical ventilation and hypoxemia. There are various causes of ARDS pneumonia, septisemia, aspiration of gastric, oral, or esophageal contents, major trauma, acute pancreatitis, transfusion associated acute lung injury (TRALI),drugs overdose, smoke inhalation, near drowning, shock, high altitude. ARDS is associated with several comorbidities including air pollution[1,2],alcohol abuse[3],hypoalbuminemia[4],and cigarette smoking[5].ARDS patients are a heterogenous group with variability in clinical presentation and outcome. To reduce this heterogeneity patients with ARDS are subclassified as with Direct ARDS (pulmonary), and Indirect ARDS (extrapulmonary).[6]

MATERIAL AND METHODS

This descriptive observational study was carried out in the Department of Medicine of a Tertiary Care Centre in Maharashtra over a period of one year.

Study population: Patients aged 13 years or older admitted to ICU with a diagnosis of Acute Respiratory Distress Syndrome.

Inclusion Criteria: All patients aged 13 years or older admitted with a diagnosis of Acute Respiratory Distress Syndrome. The final diagnosis of ARDS was based on two of the following criteria**.**

1. **Severity: Oxygenation**

Mild: 200 mmHg < PaO2 /FiO2 ≤ 300 mmHg
Moderate: 100 mmHg < PaO2 /FiO2 ≤ 200 mmHg
Severe: PaO2 /FiO2 ≤ 100 mmHg

2. **Onset :** Acute: Within 1 week of a clinical insult or new or worsening respiratory symptoms.
3. Chest radiographs : Bilateral opacities consistent with pulmonary edema not fully explained by effusions, lobar/lung collapse, or nodules.
4. Absence of left atrial hypertension : Hydrostatic edema is not the primary

cause of respiratory failure. If no ARDS risk factor is present, then some objective evaluation is required (e.g., echocardiography) to rule out hydrostatic edema.

Exclusion Criteria

- Patients aged < 13 years
- Those patients 13 years or older with ARDS who refused to give their written informed consent for the study.
- Patient who were not wished to continue in the study after giving the consent.

The patients were interviewed (or their relatives) who were eligible and given such written informed consent. The complete history was taken and the clinical examination was done.

Patients were managed accordingly.

Statistical analysis:

Statistical analysis was carried out with the help of SPSS (version 20) for Windows package (SPSS Science, Chicago, IL, USA).

RESULTS

Patients belonged to age groups varying from 20 years to 70 years. Majority of patients belonged to age group of 31-40 years. Majority were males (57.14%),and only 30 patients (42.85%) were females. There were 42 patients who had a direct ARDS (60%) and 28 patients had Indirect ARDS (40%). Out of 70 patients,40% of patients had DM, 25.71% patients had HTN, 51.42% of pts had CKD, 57.14% CLD, 15.71% were alcoholic males, 40% were smokers, 84.28% had shock.Total number of mild ARDS were 18.57% (13), moderate ARDS 67.14% (47), and 14.28% (10) Severe ARDS. Total deaths were 70% (49). Maximum deaths (80%) were from severe ARDS cases.

* Tables and charts:

Table 1: sex distribution of patients

Gender	No. of patients	Percentage (%)
Male	40	57.14%
Female	30	42.85%
Total	**70**	**100 %**

Table 2: % Direct and Indirect ARDS cases among males and females

	Males	Females
Direct ARDS	23 (57.5%)	19 (63.33%)
Indirect ARDS	17 (42.5%)	11 (36.66%)
Total	**40**	**30**

Table 3: Age wise distribution of no.of cases (%)

Age group	No. of cases	Percentage %
21- 30 years	15	21.42
31-40 years	36	51.42
41-50 years	09	12.85
51-60 years	04	5.71
61-70 years	06	8.57

Table 4: Clinical Outcome

	No. of cases	Percentage (%)
Recovered	21	30%
Died	49	70%
Total	70	100%

Table 5: Mortality rates among mild, moderate and severe ARDS

ARDS severity	Percentage Deaths
Mild ARDS	53.84%
Mod ARDS	72.34%
Sev ARDS	80%

Table 6: Severity of ARDS

Pao_2/Fio_2 (Severity)	No. of patients	Percentage (%)
200-300 (Mild ARDS)	13	18.57%
100-200 (Mod.ARDS)	47	67.14%
less than 100 (sev.ARDS)	10	14.28%
Total	**70**	**100 %**

Figure 7: Risk factors of ARDS

Risk factors	No. of cases	Percentage
CLD	40	57.14%
CKD	36	51.42%
CCF	53	75.71%
HTN	18	25.71%
DM	28	40%
Smoking	28	40%
Alcoholic	11	15.71%
Shock	59	84.28%

DISCUSSION

Old age is an independent risk factor for ARDS mortality.[7,8,9,10,11,12,13,14,15] In our study maximum mortality seen in middle aged people.Many studies shows that Dm is associate with a reduced risk of developing ARDS.[16,17,18,19] But some studies shows there is higher mortality of patients with ARDS and DM.[20] Some studies shown lower mortality of patients with DM and septic shock.[21] Some studies shown no significant association of ARDS mortality with DM.[22,23,24]Our study found no association of DM with ARDS mortality. One study reported that sepsis associated ARDS has increased mortality, severe disease, lower PaO2/FiO2 ratio.[25] Present study didn't reported such association. Smoking, alcoholism and Sex all are reported to be associated with mortality with ARDS.[26,27,28,29,30,31,32] Our study does not reported ARDS mortality association with smoking, alcoholism or sex. LUNG SAFE study reported 34.9% mortality in mild ARDS, 40% for those of moderate ARDS, and 46.1% of severe ARDS.[33] In our study mortality in mild ARDS was 54% , in moderate ARDS 72% , and in severe ARDS 80%.In our study most of the ARDS patients had some comorbidities rather than pulmonary infections. But in a study of Vigg *et al.* [35] shown maximum number of cases from pulmonary infections

With increasing age there were no statistically significant mortality increase seen in our study, though previous other studies had noted significant increase in mortality with increasing age. However a study conducted by Agarwal *et al.*.[34] found that there is no significant difference in outcome when compared between young patients and patients with age more than 50 years. Our study shows the corelation between PaO2/Fio2 ratio at the admission and survival. Patients with ratio 200-300 have better survival, and ratio less than 100 had more deaths. A study performed by P.Squara[36] shown similar association. Mortality in our study is 70%. A study performed by Agarwal *et al.*.[34] had mortality of 47.8%. There is no significant difference of mortality between Direct ARDS and Indirect ARDS.

CONCLUSIONS

Most of the patients with ARDS admitted in ICU were having some previous comorbidities like chronic kidney disease, chronic liver disease, HTN, DM, CCF. So, early intervensions to to control these comorbidities definitely will improve the outcome of ARDS patients. Majority of mortality among studied population in this study was from severe ARDS category. So, PaO2/FiO2 ratio is an important predictor of mortality in ARDS. It also shown than ventillatory management of ARDS patient is atmost important.

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