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Respiratory distress in the emergency department of Mohamed V Military Hospital in Rabat: Epidemiological, Etiological, Therapeutic and Prognostic Profile

Mounir LEKHLIT, Hamza TOBI *, Said JIDANE, Ahmed BELKOUCH and Lahcen BELYAMANI

Department of Emergency, Mohammed V Military Training Hospital, Rabat, MOROCCO.

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Abstract

Acute respiratory distress is a common and life-threatening emergency requiring rapid diagnosis and management. Understanding its clinical patterns is essential to improving patient outcomes.

We conducted a prospective descriptive study over six months (Dec 2023–May 2024), including 89 patients admitted for acute respiratory distress. Data collected included demographics, clinical and paraclinical findings, treatments, and outcomes.

The prevalence of respiratory distress was 12.8% among 695 emergency admissions. The mean age was 69 ±11 years; 65.2% were male. The leading symptoms were dyspnea (100%) and tachypnea (87.7%). Etiologies were predominantly pulmonary (hypoxemic pneumonia 56.2%, pleural effusions 43.8%), followed by cardiogenic causes (pulmonary edema 23.6%). High-concentration oxygen was used in 43.8% of cases, non-invasive ventilation in 34.8%, and invasive ventilation in 12.3%. Overall, 56.2% received empiric antibiotics; 37.1% underwent pleural drainage.

Respiratory distress is frequent in our setting, mainly due to pulmonary and cardiac causes. Non-invasive ventilation played a central role in management. Early identification and targeted therapy are essential to improve prognosis.

Keywords: Respiratory distress; Dyspnea; Non-invasive ventilation; Invasive ventilation

1. Introduction

Respiratory distress is a frequent and critical reason for consultation in emergency departments. It is defined by the respiratory system's inability to ensure adequate tissue oxygenation and/or effective carbon dioxide elimination, thereby posing an immediate threat to life. International epidemiological data, as reported by Linko et al. [1] and Lewandowski [2], estimate the annual prevalence of respiratory distress between 88.6 and 149 cases per 100,000 inhabitants. The effective management of this emergency depends on the speed of diagnosis and the early implementation of appropriate therapeutic measures [3]. Within this context, we conducted a prospective descriptive study in the emergency department of Mohamed V Military Hospital in Rabat from December 2023 to May 2024, aiming to describe the epidemiological, diagnostic, etiological, therapeutic, and prognostic profiles of patients admitted for respiratory distress.

* Corresponding author: H. TOBI.

2. Methodology

The study included 89 patients presenting with dyspnea associated with signs of respiratory effort, desaturation (SpO2 < 93%), and an abnormal respiratory rate (< 12 or > 20 breaths/min). Patients with non-respiratory causes of dyspnea (Kussmaul breathing, hysteria, etc.) were excluded [4]. Data collection was conducted using a structured form encompassing clinical, biological, radiological, and therapeutic parameters. Statistical analysis was performed using SPSS version 23.

3. Results

Of the 695 admissions during the study period, 89 were for respiratory distress, representing a prevalence of 12.8%. The average age was 69 ± 11.18 years, with a clear male predominance (male-to-female ratio of 1.87). Clinically, all patients presented with dyspnea, and 14.6% reported chest pain. Tachypnea was observed in 87.7%, tachycardia in 78%, and signs of respiratory struggle in 47.2%. Congestive heart failure signs were found in 44.9%.

Table 1 Distribution of Patients by Etiology

Etiology	Frequency	Frequency
COPD-Pneumonia	16	17.98
COPD-Pleural effusion	3	3.37
COPD-Pneumothorax	1	1.12
COPD-Pulmonary embolism	1	1.12
COPD-Therapeutic non-compliance	2	2.24
Cardiogenic PE-Pneumonia	5	5.62
Cardiogenic PE-Atrial fibrillation	2	2.24
Cardiogenic PE-Pleural effusion	7	7.87
Cardiogenic PR-Therapeutic non-compliance	7	7.87
Nephrogenic pulmonary oedema	4	4.48
Severe acute asthma	2	2.24
Pneumonia(non COPD related)	29	32.59
Pleural effusion (non COPD related)	25	28.09
Pneumothorax (non COPD related)	1	1.12
OSAS	1	1.12
Restrictive syndrome- bowel obstruction	1	1.12

Paraclinical investigations showed acute respiratory failure in 62.9% of cases (PaO2/FiO2 ratio < 300), leukocytosis in 50.6%, elevated CRP in 83.1%, and elevated D-dimers in 67.4%. Chest X-rays revealed pleural syndromes in 43.8%, bronchial patterns in 24.7%, alveolar syndromes in 20.2%, and were normal in 6.7% of cases. Thoracic CT scans identified pulmonary embolisms, pneumonias, pleural effusions, and parenchymal consolidations. Transthoracic echocardiography was performed in 63 patients, with targeted pulmonary or cardiac assessment.

Pulmonary and pleural etiologies predominated, with hypoxemic pneumonias (56.2%) and pleural effusions (43.8%) leading [5], followed by acute exacerbations of COPD (17.9%) and cardiogenic pulmonary edema (23.6%) [6]. Less frequent causes included acute severe asthma, pulmonary embolism [7], and nephrogenic pulmonary edema.

Initial treatment was based on oxygen therapy via high-concentration mask (43.8%), non-invasive ventilation (34.83%), nasal cannula (8.99%), or intubation (12.36%) [8]. Etiologic treatment included empiric antibiotic therapy (56.18%), pleural drainage (37.08%), corticosteroids (24.72%), bronchodilators (22.5%), diuretics for cardiogenic

pulmonary edema, and hemodialysis in 3 patients. Favorable outcomes were observed in 58.4% of patients, 7.9% were transferred to the intensive care unit, and the mortality rate was 9%.

Table 2 Patient Distribution by Outcomes

Outcome	Frequency	Percentage (%)
discharged	52	58.4
death	8	9.0
Transferred-cardiology	4	4.5
Transferred-pulmonology	15	16.9
Transferred-thoracic surgery	1	1.1
Transferred-ICU	7	7.9
Transferred-nephrology	2	2.2

4. Discussion

The results of our study confirm that respiratory distress is a common and severe condition encountered in emergency settings. Its prevalence, in line with findings from Maad [9] and Linko [1], highlights the necessity of structured triage and rapid management protocols. The predominantly elderly and male population reflects a higher incidence of predisposing respiratory and cardiovascular risk factors [10]. Dyspnea was the principal symptom, emphasizing the need for a rigorous clinical evaluation [11], where respiratory rate, oxygen saturation, and signs of distress serve as essential severity markers. Associated chest pain warrants evaluation for cardiovascular causes, particularly pulmonary embolism and acute pulmonary edema [12]. Arterial blood gas analysis, especially the PaO2/FiO2 ratio, proved to be a reliable tool for identifying acute respiratory failure [13]. The high prevalence of inflammatory markers, notably CRP, supported the infectious nature of many etiologies, including pneumonias [14]. Elevated D-dimers led to the diagnosis of pulmonary embolism, corroborating findings by Monreal and Berliner [7, 15]. Thoracic imaging was indispensable: while chest radiography helped orient the diagnosis in most cases, CT scans provided definitive confirmation in more complex scenarios. Point-of-care ultrasound, particularly lung ultrasound, played a vital role in bedside diagnosis [16].

Symptomatic management relied heavily on oxygen therapy, primarily via high-concentration masks or non-invasive ventilation. The latter demonstrated significant efficacy in COPD exacerbations and cardiogenic pulmonary edema, as evidenced by Brochard, Keenan, and Peter [8, 17, 18]. Invasive intubation, although reserved for severe cases, remains associated with increased morbidity [19]. Etiologic treatments were tailored: antibiotics for pneumonias, pleural drainage, corticosteroids and bronchodilators for COPD, diuretics for pulmonary edema, and dialysis when necessary. The overall clinical evolution was favorable in most cases, with a 9% mortality rate, consistent with findings by Ray and Maaroufi [6, 20]. This study underscores the heterogeneity and complexity of respiratory distress syndromes and the need for a multidisciplinary, coordinated approach.

5. Conclusion

Respiratory distress represents a significant burden in emergency care, particularly among the elderly population. Prompt identification of etiology and appropriate treatment, supported by clinical acumen and diagnostic tools such as imaging and blood gas analysis, is crucial to reduce morbidity and mortality. The findings of this study support the implementation of structured emergency protocols and the reinforcement of multidisciplinary collaboration to optimize outcomes in patients presenting with acute respiratory distress.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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[17] La Respiration, Métabolisme, Système Respiratoire, Ventilation, Voies respiratoiresMots-clésДыхание, Дыхания, Физиология, Esprit, La-Respiration, Nouveau, R, Re-Spirare, Respiracioun, Respirare, Respiratio, Respiration (Cellulaire), Respirer, Souffle, Spirare'.

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