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Desvendando o edema agudo de pulmão na UPA: experiências de um estudante de medicina

Unraveling acute pulmonary edema in the UPA: experiences of a medical student

Desentrañando el edema agudo de pulmón en la UPA: experiencias de un estudiante de medicina

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RESUMO

Objetivo: este estudo relata uma experiência educacional sobre o manejo do EAP, enfatizando a importância da abordagem interdisciplinar, multidisciplinar e da aplicação de diretrizes clínicas atualizadas. **Métodos:** descrição da vivência de um estudante de medicina em uma UPA do Rio de Janeiro, integrado em uma equipe multidisciplinar, focando no diagnóstico, tratamento e controle de fatores de riscos do EAP. **Resultados:** a experiência ressaltou o EAP como causa comum de dispneia aguda, destacando a necessidade de estratégias integradas que combinem tratamento imediato, controle de fatores de risco e suporte ventilatório, sob a orientação de uma equipe interdisciplinar. **Conclusão:** o relato sublinha o valor educacional de experiências práticas no manejo do EAP para estudantes de medicina.

DESCRITORES: Edema pulmonar; Educação médica; Serviço médico de emergência; Dispneia; Insuficiência respiratória.

ABSTRACT

Objective: this study reports an educational experience on the management of acute pulmonary edema (APE), emphasizing the importance of an interdisciplinary and multidisciplinary approach and the application of updated clinical guidelines. **Methods:** Description of a medical student's experience in an Emergency Care Unit (UPA) in Rio de Janeiro, integrated into a multidisciplinary team, focusing on the diagnosis, treatment, and control of risk factors for APE. **Results:** the experience highlighted APE as a common cause of acute dyspnea, underscoring the need for integrated strategies that combine immediate treatment, risk factor control, and ventilatory support under the guidance of an interdisciplinary team. **Conclusion:** the account underlines the educational value of practical experiences in managing APE for medical students.

DESCRIPTORS: Pulmonary edema; Medical education; Emergency medical service; Disnea; Respiratory failure.

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RESUMEN

Objetivo: este estudio relata una experiencia educativa sobre el manejo del EAP, enfatizando la importancia del enfoque interdisciplinario y multidisciplinario y la aplicación de directrices clínicas actualizadas. **Métodos:** Descripción de la experiencia de un estudiante de medicina en una Unidad de Pronta Atención (UPA) en Río de Janeiro, integrado en un equipo multidisciplinario, centrándose en el diagnóstico, tratamiento y control de los factores de riesgo del EAP. **Resultados:** la experiencia resaltó el EAP como una causa común de disnea aguda, destacando la necesidad de estrategias integradas que combinen tratamiento inmediato, control de factores de riesgo y soporte ventilatorio, bajo la orientación de un equipo interdisciplinario. **Conclusión:** el relato subraya el valor educativo de experiencias prácticas en el manejo del EAP para estudiantes de medicina.

DESCRIPTORES: Edema pulmonar; Educación médica; Servicio médico de emergencia; Disnea; Insuficiencia respiratoria.

INTRODUCTION

Acute pulmonary edema (APE) is a common cause of dyspnea, potentially lethal, in Emergency Care Units (UPA). It has as its "etiological substrate" several diseases that require specific treatment (Cabral et al., 2020). Mortality from cardiogenic PAE reaches 12% and noncardiogenic 30% (Filho et al., 2022).Rapid assessment of patients with PAE and appropriate treatment reduces mortality and morbidity(Cabral et al., 2020).

In this context, UPAs are health establishments of intermediate complexity, articulated with basic care, Mobile Emergency Care Service, Home Care, and Hospital Care, which favor the effective and efficient functioning of the Urgency and Emergency Care Network (RUE) (Goldstein; Antoine; Ray, 2021). For the most part, it deals with acute conditions or acute, performs the initial diagnostic investigation and stabilization, of the population to which it was inserted(Goldstein; Antoine; Ray, 2021).

However, a significant portion of the care is susceptible to the arrival of a more serious patient, with acute conditions, such as AP. Therefore, the importance of pathophysiological knowledge and therapeutic measures for this disease is clear.(Goldstein; Antoine; Ray, 2021).

PAE is understood as a clinical syndrome that has modifiable and nonmodifiable risk factors. Among the modifiable ones, we have: a) Healthy eating and physical activity practices, b) regular monitoring and good adherence to cardiovascular risk factor management programs, c) Prevention and control of infectious processes. All these events culminate in the permeability of the blood-air

barrier and extravasation of liquid into the interstitium and alveolar space, which deteriorate hematosis and generate acute respiratory failure (Cabral et al., 2020).

Therefore, the correct definition for everyone on the team in relation to their role as an emergency and urgent network in the management of the EAP is essential, seeking its reversal and stabilization. This management, which is essential multidisciplinary, must encompass all involved agents, from reception, risk classification, to the medical team (Reis et al., 2019). Treatment does not just include the medications applied, but rather the attention given. Not every patient with PAE arrives in critical condition. Therefore, speed in diagnosis, as well as attention to risk factors, can define evolution (Reis et al., 2019; Cabral et al., 2020).

In this context, this study reports on an educational experience in the management of AP, emphasizing the importance of an interdisciplinary and multidisciplinary approach and the application of updated clinical guidelines.

METHODOLOGY

This is an experience report that describes a narrative of the experience of a medical student at a private institution in Rio de Janeiro. During his participation as a scholarship holder in the academic program of the Municipal Secretariat of Rio de Janeiro (SMS-RJ), the student was assigned to carry out an internship at an Emergency Care Unit (UPA) located in the city of Rio de Janeiro.

The Medical Scholars program aims to offer an extracurricular internship complementary to the Medicine course, in the emergency sector, over a period of ten months. The program began in March 2023 and ended in January 2024. The internship had a workload of 12 hours a week and the activities carried out varied according to the dynamics of the unit. The activities carried out included: monitoring medical professionals in urgent and emergency care, both in the green axis offices and in the yellow and red room; guidance and qualified listening to patients; physical examination and carrying out procedures under supervision; between others.

In this report, the student shares his observations and learning during the emergency internship period at UPA. It describes the situations faced, the challenges encountered, and the interactions with patients, health professionals, and the health system in general, during the care of patients with EAP. In addition to highlighting the importance of teamwork and a multidisciplinary and interdisciplinary approach in the effective management of AP, Furthermore, this study not only describes the medical student's experience at the UPA, but also highlights the relevance of early

diagnosis, adequate treatment, and control of risk factors related to EAP, demonstrating the importance of practical training in preparing future doctors for face complex clinical challenges.

With regard to ethical aspects, this experience report reflects the authors' impressions about the experience reported; therefore, ethical assessment in research by the Research Ethics Council (CEP) is waived.

RESULTS AND DISCUSSION

During my internship in medical emergency, I was able to observe that acute lung edema (APE) of cardiac origin was one of the main causes of dyspnea found in emergency departments (UPA). Studies carried out in emergency services reinforced this finding, identifying heart disease as predominant among patients seeking care due to breathing difficulties (Santus et al., 2023; Lindskou et al., 2019; Sorensen et al., 2021).

Based on this experience and the evidence provided by a study on patients with respiratory emergencies, it is possible to understand that respiratory failure is a critical situation that demands immediate care, along with other medical emergencies such as cardiac arrest, myocardial infarction, trauma, and stroke. brain (Lindskou et al., 2019). This reflection highlights the importance of medical training and emergency training to recognize and effectively deal with acute respiratory conditions.

Regarding the diagnosis of AP, it became evident during the internship that physicians must pay special attention to a detailed history, past pathological history, and complete physical examination. During this experience, the clinical signs observed the most frequently were the acute complaint of dyspnea associated with respiratory effort and respiratory auscultation rales, often accompanied by poorly controlled systemic arterial hypertension.

Although PAE is typically associated with left heart failure (HF), it can also present with signs of right HF, such as edema of the lower extremities, pathological jugular distension, or hepatojugular reflux.(Tagami; Ong, 2018; Zanza et al. 2023). However, an important aspect that emerged during the consultations is that it is not necessary for all these symptoms to be present to reach a diagnosis.

This finding raises significant reflection on medical practice and the interpretation of symptoms. It shows that although the medical literature can describe a comprehensive list of signs and symptoms associated with PAE, in clinical practice, not all of them can be present in a single patient. This highlights the importance of a holistic and individualized approach in evaluating each

case, recognizing that the clinical presentation may vary and that an accurate diagnosis requires a careful analysis of all available elements, even if not all are present.

This reflection during the internship reinforces the need for a sensitive and individualized clinical approach, which values both the evident and subtle aspects of the patient's presentation, always with the aim of providing the best possible care.

After observing several treatments, the importance of determining the cause of acute pulmonary edema (APE) and confirming it through imaging tests was clearly seen. This step is crucial to guide the professional in choosing the best therapeutic approach. Reflecting on the study, I understood that this process involves careful analysis of chest x-rays in search of signs of pulmonary congestion, aiming to identify triggering factors or possible complications, as highlighted in the literature (Santos; Filho; Sousa, 2022).

This approach highlights the need for an accurate and detailed assessment to ensure effective management of PAE patients, which reinforces the importance of integrating theoretical knowledge and clinical practice.

In the clinical management of patients diagnosed with acute pulmonary edema (APE), the administration of additional oxygen is recommended when peripheral saturation is below 95%, with the objective of preventing the cellular damage associated with hypoxemia (Tofani et al., 2023). Given the hydrostatic imbalance of the intrapulmonary vasculature, which results in hypoxemia and increased myocardial oxygen consumption, it is crucial to implement therapies that partially or completely restore adequate oxygen supply to tissues. Thus, it is already well established in the literature that the adoption of noninvasive positive pressure ventilation support has beneficial effects and can be used in two modalities, such as Bi-Level Positive Airway Pressure (BiPAP) or Continuous Positive Airway Pressure (CPAP).

Reflecting on these guidelines, we understand the importance of a precise and personalized therapeutic approach to optimize the management of PAE, highlighting the relevance of noninvasive ventilatory support in improving respiratory function and reducing cardiac overload, as evidenced in the literature (Tofani et al., 2023). This reflection reinforces the need for an evidence-based and interdisciplinary approach to achieve the best results in the treatment of AP.

Despite the various existing guidelines and guidelines for the treatment of acute respiratory edema (APE), in clinical practice, a greater tendency for doctors was observed to opt for CPAP instead of BiPAP, resulting in a reduction in respiratory effort. This preference was evidenced in

the internship experience and is supported by Goldstein's studies, which demonstrated a decrease in the mortality rate and the need for orotracheal intubation associated with the use of CPAP (Tofani et al., 2023).

Reflecting on this observation, it is understood that the choice between CPAP and BiPAP can be influenced by a variety of clinical factors, including the severity of the patient's condition and the availability of resources. This reflection highlights the importance of an individualized approach in the treatment of AP, where the therapeutic decision is based not only on standard guidelines but also on a careful assessment of the specific needs and conditions of each patient.

In clinical practice in UPA, it was observed that, after the diagnosis of acute lung edema (APE) and the application of a positive pressure and oxygen enrichment ventilation strategy, patients experienced alveolar expansion in less than 30 minutes. This shows the benefits of therapy for patients with PAE, improving their gas exchange. However, it is important to note that the use of Non-Invasive Ventilation (NIV) requires an interdisciplinary team made up of nurses, nursing technicians, and physiotherapists properly trained to implement, monitor, and identify possible complications, such as low tolerance, skin, or nose injuries. , and the possible need for tracheal intubation.

At the UPA where the internship was carried out, the absence of a physiotherapy team represented an additional challenge for the medical team, which sought to overcome obstacles to reduce mortality and improve the management of acute lung edema (APE). However, it was possible to count on the active participation of other healthcare professionals, such as nurses and nursing technicians, who played a fundamental role in stabilizing patients with PAE. This interdisciplinary collaboration highlights the importance of the availability of adequate resources and teamwork to ensure the provision of quality care to patients in emergencies, such as AP.

During the internship, it was clearly observed that inadequate blood pressure (BP) control becomes one of the main risk factors for the development of acute lung edema (APE). This observation led to reflection on the importance of monitoring BP levels, both in the risk classification of patients and in the red room, as a crucial measure to classify patients in the different clinical scenarios of PAE. Furthermore, this understanding highlights the need for a comprehensive approach to the management of PAE that not only treats acute symptoms, but also seeks to identify and control underlying risk factors, such as high blood pressure, to prevent future complications and possible reentry into emergency services.

Therefore, three distinct scenarios were observed based on blood pressure (BP) values, the presence of dyspnea, and congestive signs. Patients with SBP above 160 mmHg, with dyspnea, bibasal rales, and significant decrease in oxygen saturation, were observed. Furthermore, there have been cases of patients with SBP within the normal range of 100 to 140 mmHg, but with dyspnea and signs of pulmonary and systemic congestion, as well as patients with arterial hypotension associated with dyspnea, with or without signs of peripheral hypoperfusion. This classification was crucial for the medical team to define the appropriate drug therapy aimed at reversing and stabilizing the patient's condition.

For patients with SBP above 160 mmHg, the literature recommends the use of vasodilators, especially isosorbide dinitrate or sodium nitroprusside (Cabral et al., 2020). During the clinical care I attended, it was common to use these medications in cases of PAE, often combined with diuretics, especially those that act on the loop of the Henle, such as furosemide, to promote rapid decongestion. These observations highlight the importance of individualizing treatment, adapting it to the specific characteristics of each patient, and constantly updating clinical practice according to the evidence available in the medical literature.

The experience in clinical practice provided a unique opportunity to learn about therapeutic approaches that can vary between different guidelines and protocols. Although not encouraged by British guidelines and the American Heart Association, the use of morphine was observed in the context of acute cardiogenic pulmonary edema, an option still covered by Brazilian protocols (Zancaner, 2020). This observation allowed for a broader understanding of medical practices in different contexts and reinforced the importance of considering the individuality of each patient when deciding on treatment.

Furthermore, the administration of morphine during care had clear benefits, such as reducing the anxiety associated with increased respiratory effort, reducing preload through vasodilation, and relieving pulmonary reflexes responsible for dyspnea. The absence of side effects identified during observation, such as myocardial and respiratory depression, nausea, or vomiting, also highlighted the safety and effectiveness of this approach in certain clinical contexts (Tagami; Ong, 2018).

In this way, practical experience provided a deeper understanding of the complexities involved in the treatment of acute pulmonary edema, allowing learning based not only on guidelines, but also on direct observation and critical analysis of actual medical practices. This

enriching experience contributes to the development of clinical skills and the formation of a more complete professional prepared to deal with a variety of situations in medical practice.

After the therapeutic approach has been established and hemodynamic stabilization has been achieved, the patients are released from the hospital environment, but it is crucial that they seek treatment for the main risk factor, especially considering that most of them are chronic hypertensive patients with inadequate control. However, when analyzing this process, I notice the presence of a worrying cycle between patients, the EAP, and the Emergency Care Unit. This dynamic appears to be influenced by the possible lack of adherence to the drug therapies recommended by the Family Clinic, whether due to personal socioeconomic issues or deficiencies in the structure itself. This reflection is supported by a study that highlighted dyspnea as a symptom frequently associated with readmissions in less than 30 days in emergency units(Sorensen et al., 2021). This suggests that the common presence of patients with dyspnea in the emergency department is correlated with a greater risk of adverse outcomes, indicating the need for greater awareness or restructuring of flow at the primary health care level.

During the internship, deep reflection was arisen about the flow of the Emergency Care Network (REU), especially when the level of complexity transcends the capacity of the unit in which we operate. It was observed that some patients, even with the diagnosis and therapeutic approach defined, did not present a reversal of their condition. This was due to the persistence of symptoms such as dyspnea, the presence of recurrent arrhythmias, a persistent lower heart rate below 40 beats per minute (bpm) or above 130 bpm, or the maintenance of systolic blood pressure below 90 mmHg. Given this situation, it was necessary to perform an orotracheal intubation to ensure patient stability. As a result, these cases were referred to tertiary units, highlighting the importance of a multidisciplinary and intersectoral approach, which effectively integrates the different levels of health care to guarantee adequate care in scenarios of greater clinical complexity.

In summary, the experience in the medical emergency internship provided a deeper understanding of acute lung edema (APE) and its clinical approach. The EAP showed that acute lung edema (APE) is a serious condition that requires immediate intervention with an interdisciplinary and multidisciplinary approach, from diagnosis to treatment. Furthermore, the experience highlighted the importance of adapting clinical guidelines to practical reality, as well as the need for a well-coordinated emergency care network. These learnings highlight the constant search for

improvements in clinical practice and the health system, always with the aim of offering the best possible care to patients in emergency situations.

CONCLUSION

This report offers a comprehensive view of the practices and learning acquired over a year of experience by a medical student in the care of patients with acute lung edema (APE). The opportunity to experience the daily life of emergency and urgency units allowed a deeper understanding of the complexities associated with this condition and improved the clinical skills necessary for its effective management.

It is essential to emphasize the importance of meticulously collecting medical data and accurately identifying risk factors during initial consultation. Anamnesis plays a crucial role in understanding the patient's condition, supporting the formulation of appropriate therapeutic strategies. It is imperative that this commitment to obtaining detailed information is maintained throughout one's professional career, aiming to constantly improve clinical skills.

It is clear that PAE should not be approached as an isolated entity, but rather as a potentially fatal condition closely linked to inadequate control of risk factors, especially blood pressure. The integration of an interdisciplinary and multidisciplinary approach from screening to advanced procedures has proven crucial to achieving favorable outcomes. Sharing this experience reinforces the great importance of controlling blood pressure as a key strategy in reducing the impact of AP on the unified health system.

In conclusion, immersion in the medical emergency internship provided an expanded view of the treatment of acute lung edema (APE) and its clinical complexity. There was a clear need for an interdisciplinary approach from the initial identification of symptoms to therapeutic intervention, emphasizing the importance of effective control of risk factors, such as high blood pressure. However, for future advances, more specific investigations into patient awareness and treatment adherence strategies are recommended, as well as studies aimed at optimizing flow in the healthcare network, with the aim of ensuring more efficient and comprehensive care. . These recommendations can provide valuable guidance to improve clinical practices and promote better health outcomes for patients with PAE and other acute respiratory conditions.

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