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Case Report

Bronchopneumonia in a Young Patient Related to Vaping: A Case Report

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ABSTRACT

The use of electronic cigarettes or vaping, has become increasingly common among adolescents and young adults, often mistakenly considered a safe alternative to conventional smoking. However, recent studies have shown an association between vaping and the development of severe lung injuries, including bronchopneumonia. This report describes the case of a previously healthy 20-year-old female patient who developed bronchopneumonia associated with the use of electronic cigarettes. The patient presented with fever, dyspnea, chest pain and a syncopal episode. A chest X-ray revealed consolidation in the right hemithorax. Laboratory tests showed hypokalemia, which was corrected during hospitalization. Antibiotic therapy with ceftriaxone and azithromycin was initiated, resulting in significant clinical improvement without the need for mechanical ventilation or intensive care unit admission. This case highlights the importance of early recognition of clinical and laboratory signs associated with vaping-induced pulmonary toxicity and the need for preventive campaigns on the respiratory risks of these substances. Outpatient follow-up with a multidisciplinary team is essential for full recovery and prevention of recurrence.

Keywords: Bronchopneumonia; Vaping; Hypokalemia; Electronic cigarette; Case report

Introduction

Bronchopneumonia is a form of bacterial pneumonia characterized by acute, multifocal inflammation of the terminal bronchioles and pulmonary alveoli, resulting in scattered

consolidations throughout the lungs. Traditionally, it is associated with predisposing factors such as immunosuppression, prior viral infections, smoking and chronic comorbidities. However, with the emergence of new inhalation devices like electronic cigarettes, a new epidemiological profile of patients

with respiratory illnesses has emerged, particularly among adolescents and young adults. Vaping is marketed as a less harmful alternative to traditional tobacco; however, the aerosols produced by electronic devices contain various chemical compounds, including propylene glycol, glycerin, nicotine and often tetrahydrocannabinol (THC) and vitamin E acetate. These elements can trigger inflammatory processes and direct injury to the respiratory epithelium, leading to clinical conditions such as bronchopneumonia, lipid pneumonitis and EVALI (E-cigarette or Vaping product use-Associated Lung Injury).

Additionally, electrolyte imbalances such as hypokalemia have been described in patients with acute respiratory conditions, especially in the presence of prolonged fever, vomiting, diuretic use or dietary changes. Hypokalemia may contribute to respiratory muscle weakness, worsening the clinical scenario and increasing the risk of respiratory failure. In this context, comprehensive assessment of young patients presenting with acute respiratory symptoms is essential, even in the absence of prior comorbidities. The association between vaping and lung injury should always be considered and management should include not only infection treatment but also correction of potential metabolic disturbances and strong counseling for permanent cessation of electronic cigarette use.

Objectives

This study aims to report a clinical case of bronchopneumonia in a previously healthy young patient with associated hypokalaemia, in which electronic cigarette use was the likely etiological factor, contributing to the discussion on the respiratory risks of vaping in young populations.

Study Design and Methods

This is a retrospective case report based on electronic medical records, supplemented by a brief literature review.

Case Report

A 20-year-old female patient, previously healthy, was admitted on 05/03/2024 with fever, dyspnea, chest pain and a syncope episode after five days of respiratory symptoms. A chest X-ray revealed bronchopneumonia with consolidation in the right hemithorax. The patient had associated hypokalemia. She denied any comorbidities but reported the use of electronic cigarettes. Physical examination revealed decreased vesicular breath sounds and crackles at the right lung base; vital signs and neurological examination were within normal limits. Arterial blood gas and electrolytes confirmed hypokalemia, which was corrected during hospitalization. Antibiotic therapy with ceftriaxone (2 g/day for 7 days) and azithromycin (500 mg/day for 5 days) was initiated, with a good clinical response. The patient showed progressive improvement, maintaining a productive cough but without fever or signs of respiratory worsening. Mechanical ventilation or ICU admission was not necessary. After clinical stabilization, she was discharged with a prescription for home inhalation therapy and outpatient follow-up at the Primary Health Unit (PHU) and with a pulmonologist. A medical certificate and instructions for returning in case of clinical deterioration were also provided.

Conclusion

This case reinforces the growing concern within the medical and scientific community regarding the harmful effects of

electronic cigarettes on lung health, particularly among young people. Bronchopneumonia associated with vaping, although still underreported, represents a clinical entity with potential for rapid deterioration, especially when accompanied by metabolic disturbances such as hypokalaemia. The favourable clinical outcome observed in this patient demonstrates the importance of early intervention, including prompt initiation of broad-spectrum antibiotics and appropriate electrolyte replacement. The absence of comorbidities and the young age were protective factors that allowed recovery without the need for ventilatory support or intensive care.

However, it is crucial to emphasize that the same condition could take a more severe course in individuals with additional risk factors. Beyond clinical treatment, a robust preventive approach is needed. The lack of awareness about the adverse effects of vaping, combined with widespread commercial promotion of these devices, contributes to their trivialization among youth. Therefore, the implementation of educational initiatives in schools, universities and health services is essential to raise awareness about the risks associated with vaping. Clinically, this report highlights the importance of including electronic cigarette use in the anamnesis of young patients presenting with acute respiratory diseases. Careful evaluation of radiological, laboratory and clinical signs should guide differential diagnosis, with vaping-associated bronchopneumonia being a possibility that deserves greater recognition. Lastly, outpatient follow-up after hospital discharge is essential. Pulmonary recovery can be slow and cessation of smoking even in its electronic form must be strongly reinforced with the support of a multidisciplinary team, including pulmonologists, general practitioners, psychologists and primary care professionals. Cases like this demonstrate that although vaping is often perceived as harmless, it can trigger serious and potentially fatal consequences, requiring a vigilant, critical and preventive stance from healthcare professionals.

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