

Post Antibiotic Grade IV Anaphylaxis: A Case Report from the Emergency Department of Chu Donka

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Abstract

Anaphylaxis is a serious systemic reaction that is part of the general pattern of potentially fatal hypersensitivity reactions requiring immediate management. We report the case of a patient presenting to emergency with signs of malaria and pneumonia who was diagnosed with grade 4 anaphylaxis following antibiotic injection in the emergency department. The patient was 30 years old, with no previous history of anaphylaxis, and presented to the emergency department with fever, dry cough, headache and dizziness associated with prostration. Physical examination showed stable hemodynamics (BP = 110/80 mmHg, HR = 95 p/min,) and respiratory function with SpO₂ = 98%, HR = 22 c/min and crepitus rales at the base of the lungs. The laboratory work-up carried out in the emergency department revealed a biological inflammatory syndrome associated with hyperleukocytosis of 11,260/mm³, a positive thick drop with GE(+) dp = 1183 T/microlitre; blood glucose = 0.83 g/l; Covid 19 RDT = (negative). A diagnosis of malaria and pneumonia was made and antibiotic therapy (ceftriaxone) and artesunate were indicated. During the injection of ceftriaxone 1 g, the patient became agitated, followed by cardiorespiratory arrest, confirming the diagnosis of stage 4 anaphylaxis. Treatment consisted of stopping the ceftriaxone injection, external cardiac massage and ventilation, intravenous adrenaline and vascular filling, which enabled the patient to recover and stabilize. The diagnosis of anaphylaxis is clinical. Early administration of adrenaline is the mainstay of treatment.

Keywords

Grade 4 Anaphylaxis, Adrenaline, Antibiotics, Emergencies

1. Introduction

Anaphylaxis is defined as “a severe and potentially fatal systemic hypersensitivity reaction occurring abruptly following exposure to an allergen” [1] [2] [3].

In children, food is the main trigger, while drugs and hymenoptera venom are more common in adults. Antibiotics, mainly beta-lactam antibiotics and non-steroidal anti-inflammatory drugs, are the most frequently cited [1].

The actual incidence of anaphylactic events remains poorly known and appears to be underestimated. Existing epidemiological studies are heterogeneous and most often based on self-reporting [4] [5].

In the United States, a 2014 study showed that case fatality rates associated with anaphylaxis ranged from 0.25% to 0.33% among hospital admissions or emergency department presentations with anaphylaxis as the principal diagnosis. These rates represent 63 to 99 deaths per year in the United States, of which approximately 77% occur in hospitalized patients [2].

The absence of epidemiological data in Guinea and the low incidence of severe cases in our hospital prompted us to conduct this study, which reports the case of a patient presenting to the emergency with signs of malaria and pneumonia, who has been diagnosed with grade 4 anaphylaxis following antibiotic injection in the emergency department.

2. Observation

Mr RV, a Maghrebi, aged 30, merchant, with no previous history, was admitted to the emergency intensive care unit at Donka University Hospital, on 10 June 2022, at about 1 p.m., for altered consciousness in the context of a cardiocirculatory arrest. The patient had consulted the emergency department with a fever, dry cough, headache, and dizziness that had been present for five days, associated with prostration.

The physical examination showed that the patient was in good general condition, with a temperature of 38.4°C and hemodynamic and respiratory stability. BP = 110/80 mmHg, HR = 100 p/min, SpO₂ = 98%, FR = 22 c/min.

Biological tests revealed a hyperleukocytosis of 11,260/mm³ and a haemoglobin level of 15 g/dl. The thick blood cell count was positive for *Plasmodium falciparum* at 1183 T/microlitre. Blood glucose = 0.83 g/l; Covid 19 RDT = (negative).

The diagnosis of severe malaria and pneumonia was accepted. Treatment was based on artesunate, paracetamol 1 g infusible and intravenous ceftriaxone combined with fluid maintenance. During the course of treatment by the nurse, who had ensured that the patient had no history of allergy, just as the ceftriaxone 1g

was being administered, the following symptoms were observed: skin rash; body cold; fall in blood pressure with a thready pulse; dyspnoea and agitation; followed by a respiratory pause. The diagnosis of stage IV post-antibiotic anaphylaxis was accepted. Treatment included discontinuation of ceftriaxone, external cardiac massage and mechanical ventilation with oxygen therapy, adrenaline 1 mg/3min, and correction of blood volume with isotonic saline and haemal 500 ml. Admitted to intensive care after recovery of cardiac activity, we gave dexamethasone 8 mg IVD and continued adrenaline 0.1 mg to 0.2 mg repeated every 1 to 2 min until recovery of the hemodynamic state.

After 45 minutes, the patient was seen conscious, with BP 80/60 mmHg, pulse 123 p/min and SpO₂ = 85% on 10 l/min oxygen. The patient was not intubated.

The clinical course was marked at H3 of hospitalisation by haemodynamic stability with a blood pressure of 110/86 mmHg and a heart rate of 110 bpm. Respiratory rate was 25 c/min and peripheral oxygen saturation (SpO₂) 98% on 3 l/min oxygen. The patient was clinically monitored for 9 hours before discharge against medical advice at 10 p.m.

3. Discussion

The prevalence and incidence of anaphylaxis in the general population are underestimated. In fact, this condition is underdiagnosed because of the variety of clinical manifestations [4] [5].

Epidemiological data are inconsistent, as they are derived from studies with heterogeneous methodologies (varying populations and diagnostic criteria). In Europe, prevalence has been estimated at 0.3% [1]. No hospital data are available in our context.

Anaphylaxis is a severe, generalised, systemic hypersensitivity (or allergic) reaction that can be life-threatening [1]. It occurs a few minutes to a few hours after exposure to a triggering factor [3]. It is characterized by the sudden onset of potentially fatal upper or lower airway or cardiovascular disease. In our case, the signs appeared during administration of the antibiotic (ceftriaxone), with abrupt involvement of the respiratory and cardio-circulatory systems.

The diagnosis was clinical. It is a rapidly progressive disease. It is characterized by the sudden onset of symptoms affecting several organs and appearing a few minutes to a few hours after exposure to a triggering factor. This period varies according to the way in which it enters the body [1] [3] [4].

Anaphylactic shock, the most serious manifestation of immediate hypersensitivity reactions, remains a major cause for concern in both intensive care anaesthesia and emergency medicine, as it often occurs unpredictably, can be life-threatening, and sometimes responds poorly to standard treatment [6].

There are no predictive factors for the severity of anaphylaxis early in its course, and death can occur within minutes regardless of the initial symptom [3]. However, the earlier the clinical manifestations appear after contact with the triggering factor, the greater the severity [1]. Respiratory and cardiovascular

disorders are life-threatening.

In children, food is the main trigger, while drugs and hymenoptera venoms are more common in adults. In 20% of cases, the triggering factor is not identified. It varies according to age and the geographical areas studied [1]. In Europe, the main causes of anaphylaxis are: food (65% in children and 20% in adults), insect venom (20% in children and 48% in adults) and drugs (4.8% in children and 22% in adults). In our case, it was the intravenous administration of an antibiotic (ceftriaxone) that was incriminated.

Antibiotics, mainly beta-lactams and non-steroidal anti-inflammatory drugs, are the most frequently cited [1].

According to a study carried out in France in 2017, Pouessel G. *et al.* found that the causes of death from anaphylaxis were iatrogenic (63%), mainly drug-related, insect venoms (14%) and food (0.6%). The mortality rate was higher in men than in women [7].

Anaphylaxis can occur in any patient with an unknown history of allergy, so patients receiving intravenous antibiotics in emergency departments should be closely monitored [2].

The principle of treatment is based on the management of the immediate life-threatening emergency, early administration of IM adrenaline, avoidance of the allergen and rapid initiation of additional treatments tailored to the symptoms and clinical severity [1] [5]. There are no absolute contraindications to the use of adrenaline in cases of anaphylaxis, including in elderly patients, during pregnancy, or if there is an associated cardiovascular comorbidity.

The determination of mast cell degranulation markers is not intended for the initial diagnosis or emergency treatment of anaphylaxis. It should not delay treatment. On the other hand, it is useful to perform it during the episode, in order to support the diagnosis, particularly when the clinical picture is atypical. [1] [8]. We did not measure these markers in our situation.

In our case, the patient was monitored for only 9 hours, with medical advice given before discharge. The minimum duration of monitoring after resolution of anaphylaxis is six hours [1] [9] [10]. In the event of severe respiratory or cardiovascular damage, monitoring should be extended to 12 to 24 hours.

4. Conclusion

An anaphylactic reaction can be life-threatening. It can occur in any patient with an unknown history of allergy. Practitioners must therefore remain vigilant and follow guidelines recommending the early administration of adrenaline to further reduce anaphylaxis-related deaths.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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