

## Fatal Anaphylactic Shock Following Tazocin Administration in a Lung Adenocarcinoma Patient: A Case Report

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**Abstract:** Background: We present the case of a 63-year-old male with a history of multiple comorbidities, including lung adenocarcinoma, who experienced fatal anaphylactic shock following Tazocin administration. Case Presentation: On March 15, 2024, the patient presented with respiratory distress and was transferred to the medical intensive care unit (MICU) for further management. Despite initial stabilization efforts, the patient's condition deteriorated rapidly, leading to anaphylactic shock attributed to Tazocin administration. Despite intensive care interventions, the patient ultimately succumbed to respiratory arrest on March 17, 2024. Discussion: This case underscores the importance of vigilant medication administration practices, particularly in patients with known allergies. It highlights the potential life-threatening consequences of medication errors and the need for prompt recognition and management of anaphylactic reactions in clinical settings. Conclusion: The tragic outcome of this case emphasizes the critical importance of medication safety protocols and the need for enhanced awareness among healthcare providers regarding the management of allergic reactions. Further research is warranted to explore strategies for preventing medication errors and optimizing patient safety in clinical practice.

**Acknowledgments:** We would like to acknowledge the medical and nursing staff involved in the care of the patient, as well as the patient's family for their cooperation and support during this challenging time.

**Keywords:** Anaphylactic shock, Tazocin, Lung adenocarcinoma, Medication administration, Patient safety, Adverse drug reactions, Allergic reactions

Citation: Ali F, Khalid M, Aljunaydil AI, Elmalky AM. Fatal Anaphylactic Shock Following Tazocin Administration in a Lung Adenocarcinoma Patient: A Case Report. *Canad. Jr. Clin. Perf. Eval.*, 2024, 1, 8, 106-111

Academic Editor: Paul Weber  
Received: 17 January 2024  
Revised: 25 February 2024  
Accepted: 29 March 2024  
Published: 24 March 2024

### 1. Introduction

Anaphylactic shock is a severe and potentially life-threatening hypersensitivity reaction that can occur in response to various allergens, including medications. [1] Prompt recognition and management of anaphylaxis are essential to prevent adverse outcomes, yet cases of fatal anaphylactic shock still occur, underscoring the need for heightened awareness and vigilance in clinical practice. [2] Herein, we present a compelling case of fatal anaphylactic shock following the administration of Tazocin in a patient with lung adenocarcinoma. [3]

Hypersensitivity reactions to medications are a well-recognized phenomenon in clinical medicine, with beta-lactam antibiotics being among the most common culprits. [4] Tazocin, a combination of piperacillin and tazobactam, is a broad-spectrum antibiotic frequently used for the treatment of various bacterial infections. [5] While generally considered safe and effective, Tazocin can elicit hypersensitivity reactions, ranging from mild skin rashes to severe anaphylactic shock. [6]

Our case centers on a 63-year-old male patient with a complex medical history, including diabetes mellitus, hypertension, dyslipidemia, infertility, and stage 4 lung adenocarcinoma. The patient's journey began on March 15, 2024, when he presented to

the emergency department with symptoms of respiratory distress. Despite initial stabilization measures, the patient's condition deteriorated rapidly, culminating in fatal anaphylactic shock.

The sequence of events leading to the patient's demise underscores several critical aspects of clinical care, including medication safety, allergy identification, and prompt management of allergic reactions. In this case, the patient had a known allergy to penicillin, with reported symptoms limited to skin itchiness. However, despite this documented allergy, Tazocin was administered, leading to a catastrophic chain of events.

Anaphylaxis is a clinical emergency that requires immediate recognition and intervention. In our case, the patient exhibited classic signs and symptoms of anaphylactic shock, including respiratory distress, hypotension, and altered mental status. Despite the administration of epinephrine and supportive care measures, the patient's condition continued to deteriorate, ultimately resulting in respiratory arrest and death.

The tragic outcome of this case underscores the devastating consequences of medication errors and the importance of thorough allergy assessments in clinical practice. While the patient's allergy to penicillin was documented, lapses in medication reconciliation or failure to recognize the cross-reactivity between penicillin and Tazocin likely contributed to the administration of the offending agent. This highlights the critical need for robust medication safety protocols and enhanced awareness among healthcare providers regarding the risks associated with medication administration in patients with known allergies.

## 2. Case Presentation:

A 63-year-old male with a medical history significant for hypertension, type 2 diabetes mellitus, dyslipidemia, infertility, and a recent history of lung adenocarcinoma presented to the emergency department (ED) with progressive shortness of breath. His past medical history also included a known allergy to penicillin. The patient had been experiencing worsening symptoms over the past two weeks, culminating in severe dyspnea and palpitations on the day of presentation.

Upon arrival at the ED on March 15, 2024, the patient was initially triaged as an acute respiratory illness case with high risk due to his symptoms. Despite receiving oxygen via nasal cannula, his oxygen saturation remained low, prompting escalation to a non-rebreather mask. He was subsequently transferred to the resuscitation area and started on bilevel positive airway pressure (BiPAP) therapy. Initial assessment revealed tachycardia, hypotension, and signs of respiratory distress. A consult with the oncology team confirmed the patient's underlying lung adenocarcinoma and recommended admission for further management.

Despite initial stabilization measures, including intravenous fluid resuscitation and broad-spectrum antibiotics, the patient developed anaphylactic shock shortly after receiving the antibiotic Tazocin, to which he was allergic. The onset of anaphylaxis prompted the initiation of epinephrine and dopamine infusions. Although efforts were made to stabilize the patient's condition, including central line placement and additional vasopressor support, he remained hypotensive and ultimately succumbed to respiratory arrest on March 17, 2024.

Figure 1: Respiratory rate from time of admission till final outcome

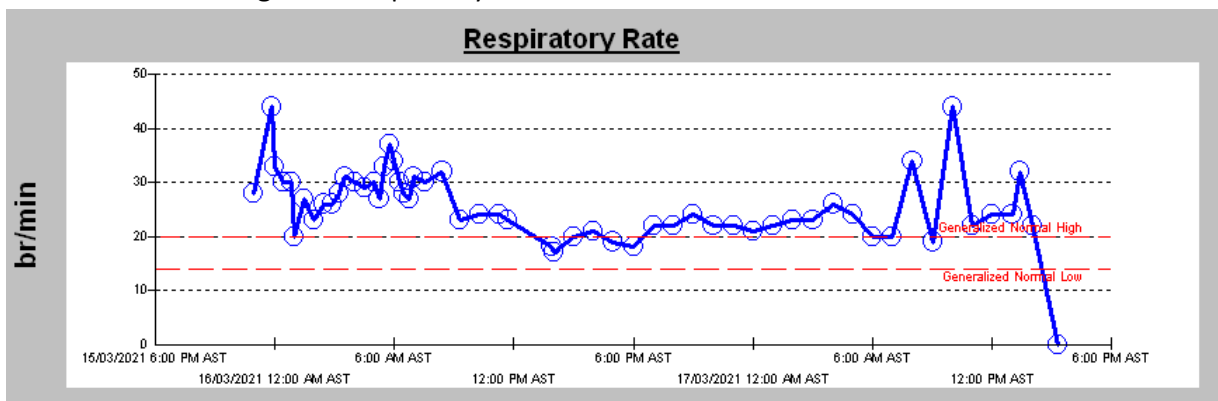


Figure 2: Systolic blood pressure from time of admission till final patient outcome

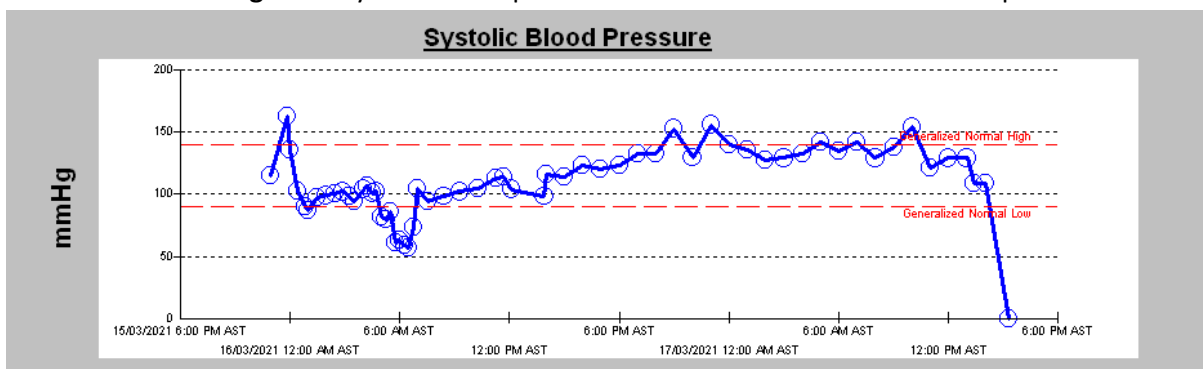


Figure 3: Chest X-ray AP view at time of admission



**Table 1:** Laboratory results @05:00 and 35:00

Detail@35:00	Value w/Units	Flags
WBC	10.200 x10 <sup>9</sup> /L	
BUN	8.3 mmol/L	HI
Creatinine	81 mcmmol/L	
CO2	31 mmol/L	
Chloride	95 mmol/L	LOW
Glucose Lvl	11.49 mmol/L	HI
Potassium Lvl	4.4 mmol/L	
Sodium Lvl	134 mmol/L	LOW
Phosphorus	1.16 mmol/L	
Osmolality	288 mOsm/kg	
BNP	317.0 pg/mL	HI
Detail@05:00	Value w/Units	Flags
UA Spec Grav	1.019	
UA pH	5.0	
UA Glucose	1+ (70-100) mg/dL	ABN
UA Ketones	Trace mg/dL	ABN
UA Protein	1+ (30-70) mg/dL	ABN
UA Nitrite	Positive	ABN
UA Leuk Est	1+ (10-40) WBC/HPF	ABN
UA WBC	178 /HPF	HI
UA RBC	4 /HPF	
UA Squam Epithelial	TRACE /LPF	NA

### 3. Discussion

This case highlights the complex management challenges encountered in critically ill patients with multiple comorbidities and medication allergies. Despite appropriate triage and initial resuscitative efforts, the development of anaphylaxis following antibiotic administration underscores the importance of thorough medication reconciliation and allergy documentation. The lack of communication between healthcare providers regarding the patient's known penicillin allergy contributed to the adverse event, emphasizing the critical role of interprofessional collaboration in patient care. [7,8]

In addition to medication-related complications, the case also underscores the challenges of managing advanced malignancy in the context of acute respiratory decompensation. Despite the use of BiPAP and vasopressor support, the patient's clinical deterioration ultimately led to a fatal outcome. This case serves as a sobering reminder of the need for comprehensive advanced care planning and end-of-life discussions in patients with advanced cancer and critical illness. [9, 10]

The management of critically ill patients with complex medical histories poses significant challenges for healthcare providers, as exemplified by this case. While prompt triage and resuscitative efforts are essential, unforeseen complications such as anaphylaxis can arise, especially in patients with multiple comorbidities and medication allergies. In this instance, despite initial stabilization measures, the administration of Tazocin precipitated anaphylactic shock, highlighting the critical importance of meticulous medication reconciliation and allergy documentation. [11, 12]

One of the glaring issues in this case was the breakdown in communication between healthcare providers regarding the patient's known penicillin allergy. This oversight underscores the necessity of seamless interprofessional collaboration and effective communication channels within healthcare teams. Had there been clear communication and proper documentation of the allergy, the administration of Tazocin could have been avoided, potentially preventing the adverse event altogether.

Moreover, the challenges of managing advanced malignancy in the setting of acute respiratory decompensation further complicated the clinical course. Despite aggressive interventions including BiPAP and vasopressor support, the patient's clinical deterioration ultimately led to a fatal outcome. This highlights the inherent difficulties in managing patients with advanced cancer who present with acute exacerbations of their underlying disease.

The case serves as a poignant reminder of the importance of comprehensive advanced care planning and end-of-life discussions, particularly in patients with advanced cancer and critical illness. While aggressive interventions may be appropriate in some cases, there must also be a recognition of the limitations of medical treatment and a focus on optimizing quality of life and symptom management for patients nearing the end of life.

Furthermore, this case underscores the need for robust medication safety protocols and systems within healthcare institutions. Implementing strategies such as electronic allergy alerts and mandatory medication reconciliation processes can help mitigate the risk of adverse drug events, particularly in patients with complex medical histories.

### **Recommendations**

The case presents several noteworthy points regarding the occurrence of anaphylactic shock in a patient with a known penicillin allergy following the administration of Tazocin. Of particular concern is the communication breakdown within the healthcare team, as evidenced by the lack of documented communication between the ordering oncology resident and other relevant stakeholders such as the oncology senior, infectious disease (ID) specialist, or clinical pharmacy. Additionally, there was a glaring absence of clinical justification provided for the use of Tazocin despite the patient's known allergy, raising questions about the availability of alternative medications. Furthermore, the electronic system in place, E-sihi, allowed the prescription of Tazocin despite the documented history of allergy, indicating a potential flaw in the system's medication safety protocols.

The verification of the first dose of Tazocin by clinical pharmacy underscores the importance of rigorous medication verification processes. However, despite this verification step, the adverse event still occurred, highlighting the need for more robust medication safety measures.

In light of these observations, several recommendations can be made to prevent similar incidents in the future. First, there should be a thorough review and discussion involving oncology, pharmacy, morbidity and mortality (M&M) review committees, and information technology (IT) specialists to identify system weaknesses and implement necessary improvements. Clear guidelines should be established for managing well-known medication allergies, including protocols for communication and consultation limitations to ensure that all relevant stakeholders are involved in decision-making processes. Additionally, there should be consideration given to implementing electronic system blocks for medication prescriptions in patients with documented allergies to prevent inadvertent prescribing of contraindicated medications. By addressing these issues and implementing proactive measures, healthcare organizations can minimize the risk of adverse events related to medication allergies and improve patient safety.

### **4. Conclusion**

This case highlights the multifaceted challenges encountered in the management of critically ill patients with advanced cancer and medication allergies. It emphasizes the critical importance of effective communication, comprehensive advanced care planning,

and robust medication safety protocols in optimizing patient outcomes and preventing adverse events. As healthcare providers, it is imperative that we learn from such cases and strive to continually improve our practices to ensure the delivery of safe, high-quality care to all patients. This case underscores the importance of diligent medication reconciliation, communication, and interdisciplinary collaboration in preventing adverse events in hospitalized patients. Moving forward, efforts to improve electronic health record systems to flag medication allergies and enhance communication among healthcare providers are warranted. Additionally, early involvement of palliative care services and advance care planning discussions can help ensure that patients receive care aligned with their goals and preferences, particularly in the setting of advanced malignancy and critical illness. Our case serves as a poignant reminder of the potential dangers of medication errors and the importance of diligent allergy assessment and medication reconciliation in clinical practice. By sharing this case, we hope to raise awareness of the risks associated with medication administration and stimulate discussion on strategies to improve patient safety in healthcare settings.

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