

Introduction

Neutropenia, or too few white blood cells in the blood, can arise from many conditions, with the most common being infectious, drug induced, or oncologic. The mechanism is typically either a decrease in the production of white blood cells or the destruction of these cells in circulation. Neutropenia, which is defined as an absolute neutrophil count of less than 1500 cells/microL, is a medical emergency in the setting of a fever or concurrent infection, as it can lead to hemodynamic instability, sepsis, and even death.

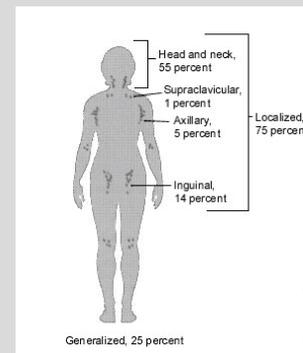
We report a case of neutropenia secondary to cefepime, an antibiotic often used to treat pyelonephritis.

Case Presentation

A 20-year-old female admitted for recurrent pyelonephritis was found to be severely neutropenic and developed a fever that day. She reported a three-month-long history of recurrent pyelonephritis with fevers, chills, sweats, fatigue, and back pain. Patient had been followed by Infectious Disease and Urology outpatient, receiving 4 weeks of cefepime via a PICC line at home. Just prior to admission, she developed worsening fevers and chills while on antibiotics, requiring further evaluation. Upon presentation, the patient was started on cefepime and vancomycin and evaluated for neutropenic fever.

Physical Exam

Cervical lymphadenopathy and pallor only pertinent findings.



Presentation of lymphadenopathy by anatomic site (in percentages).²

Results

- WBC less than 1,410 cells/microL (3 weeks prior had been 25,000 cells/microL)
- CT chest/abdomen/pelvis remarkable for renal scarring and diffuse reactive lymphadenopathy (cervical, axillary, and inguinal).
- Hematology/Oncology consultation recommended broad evaluation for infectious diseases, Hepatitis and HIV, which was negative.
- A blood smear and bone marrow biopsy negative for malignancy.
- Infectious Disease consultation recommended discontinuing cefepime, as can rarely cause hematologic changes.

Outcome

Upon stopping the cefepime, the white cell count improved significantly, from 1,050 cells/microL to 2,530 cells/microL the following day. A dose of tbo-filgrastim intradermal, prior to discharge, led to resolution of the neutropenia and to a high white blood cell count of 21,000/microL. She was discharged home on ciprofloxacin, with outpatient follow up with Infectious Disease and Hematology/Oncology.

Discussion

Neutropenia, even as a side effect of a medication, is a serious medical condition that requires appropriate measures to prevent widespread infection in this immunocompromised state. The incidence of drug-induced neutropenia ranges from 2 to 15 cases per million people. A recent study in 2019 found that neutropenia occurs in less than 1% of cefepime administrations. Proper referral or consultation by a Hematologist is critical for ensuring the safety of these patients.

References

1. Berliner, Nancy. Approach to the adult with unexplained neutropenia. Uptodate March 2020. https://www.uptodate.com/contents/approach-to-the-adult-with-unexplained-neutropenia?search=neutropenia&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1
2. Ferrer R. Lymphadenopathy: Differential Diagnosis and Evaluation. *American Family Physician*. 1998;58(6):1313-1320. www.ncbi.nlm.nih.gov/pubmed/9803196?dopt=Abstract
3. Foong KS, Hsueh K, Bailey TC, et al. Cluster of Cefepime-Induced Neutropenia During Outpatient Parenteral Antimicrobial Therapy. *Clin Infect Dis*. 2019;69(3):534-537.