Daptomycin-Induced Eosinophilic Pneumonia: Can an Antibiotic Cause Pneumonia?

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Introduction

Daptomycin is a cyclic lipopeptide antibiotic that is used to treat different bacterial infections caused by Gram-positive bacteria, including methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant enterococci (VRE). The use of daptomycin has increased recently as an alternative in vancomycin-resistant cases and so have the chances to explore the potential side effects of this drug. Musculoskeletal adverse effects of daptomycin are known, but it can also have pulmonary adverse effects. Here, we report a case of a patient on daptomycin who came into the hospital with respiratory distress. This case report addresses this rare side effect of eosinophilic pneumonia and its management in the inpatient setting as although it is rare but can be life-threatening if not treated appropriately.

Discussion

With the recent increase in daptomycin use, it is important to know this potentially life-threatening adverse effect of daptomycin. There is a need to study the pathophysiology by which this drug causes eosinophilic pneumonia as it is not fully understood. The pathophysiology of acute eosinophilic pneumonia is thought to be caused by the detection of an antigen by alveolar macrophages, which leads to the recruitment of T-helper 2 lymphocytes and subsequent release of interleukin 5. Interleukin 5 promotes eosinophil production and migration to the lung. More research and awareness of this risk is necessary so that the drug can be stopped promptly if pulmonary symptoms develop in a patient on daptomycin. For most patients who have suspected daptomycin-induced eosinophilic lung disease, a good history provides a presumptive diagnosis that can be confirmed by lung imaging and differential blood count, leading to early diagnosis and appropriate management. Furthermore, alveolar lavage has been done in previous case reports in order to establish a diagnosis, but most of the time, imaging and blood workup are enough; thus, we avoided an invasive procedure in our patient as she improved with our management.

Conclusion

It is important to have a broad differential diagnosis in patients presenting with imaging findings of pulmonary infiltrates. As the pulmonary toxicity of daptomycin reverses with its discontinuation and administration of steroids, it would be important for physicians to have a low threshold to think of daptomycin causing eosinophilic pneumonia if a patient has a history of its use as it can reduce further complications and length of hospital stay. Failure to diagnose it at early stages can lead to respiratory failure. As the use of daptomycin is increasing, it is important for clinicians to diagnose and appropriately manage this rare but potentially life-threatening side effect.

Case presentation

Our patient is a 71-year-old female who presented to the emergency department from a rehabilitation facility with complaints of fever and shortness of breath. She had been admitted to the hospital a month ago for osteomyelitis of the right foot and was discharged to a rehabilitation facility on daptomycin (500 mg IV daily) and ertapenem with a peripherally inserted central catheter (PICC) line in place. During that hospital visit, the patient's chest X-ray (Figure *1*) was done, which did not show any infiltrates or consolidation at that time. After a few weeks at the facility, the patient developed fever spikes, and a chest X-ray was done, which showed bilateral infiltrates. Levofloxacin was added to the ongoing antibiotics to cover for pneumonia. However, over the next several days, her fever persisted, and her breathing worsened prompting an ER visit. On presentation to the ER, the patient was hypoxic and tachypneic. Oxygen supplementation via nasal cannula was started. Chest auscultation revealed bilateral crackles. The initial working diagnosis was acute hypoxic respiratory failure secondary to early acute respiratory distress syndrome vs. healthcare-associated pneumonia. Meropenem was started with ongoing daptomycin, but symptoms did not improve. A chest X-ray in the hospital showed diffuse bilateral opacities (Figure *2*) consistent with our initial diagnosis. After a few weeks at the facility, the patient developed fever spikes, and a chest X-ray was done, which showed bilateral infiltrates. Levofloxacin was added to the ongoing antibiotics to cover for pneumonia. However, over the next several days, her fever persisted, and her breathing worsened prompting an ER visit. On presentation to the ER, the patient was hypoxic and tachypneic. Oxygen supplementation via nasal cannula was started. Chest auscultation revealed bilateral crackles. The initial working diagnosis was acute hypoxic respiratory failure secondary to early acute respiratory distress syndrome vs. healthcare-associated pneumonia. Meropenem was started with ongoing daptomycin, but symptoms did not improve. A chest X-ray in the hospital showed diffuse bilateral opacities (Figure *2*) consistent with our initial diagnosis.

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