

Case Presentation

Treatment-Resistant Vancomycin-Induced DRESS Syndrome in a Post-Operative Orthopedic Patient with Rare Lung Involvement

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Abstract

Drug reaction with eosinophilia and systemic symptoms or DRESS syndrome is a rare and poorly understood disease with severe systemic manifestations and significant mortality risk. This case report describes a patient with recent surgery on the right knee and started on post-op antibiotics who presented with severe rash and fever. The patient was not improving with corticosteroid treatment and continued to have DRESS symptoms along with worsening respiratory status. This patient's presentation of DRESS was atypical, which may have warranted treatment such as therapeutic plasma exchange to remove inflammatory cytokines.

Keywords: DRESS; DrugReaction; Antibiotics; CaseReport; Eosinophilia

Case Presentation

A.P. underwent revision surgery for a septic right knee joint on January 16, 2023, and was discharged home on Vancomycin, Rifampin, and Ciprofloxacin. On February 1, 2023, the patient experienced a fever of 104°F, which subsided with Tylenol, but was followed by the development of a maculopapular rash on her back, progressing to her abdomen and extremities while sparing her face. Outpatient infectious disease consultation on February 2, 2023, resulted in the discontinuation of Vancomycin.

Laboratory findings revealed significant leukocytosis, anemia, and atypical lymphocytosis with eosinophilia upon admission to Capital Regional Medical Center on February 9, 2023. A chest X-ray displayed mild bibasilar densities and subsequent CT chest revealed diffuse bilateral

reticulonodular opacification. The patient's rash and episodic fevers persisted despite transitioning to Daptomycin. At this time, the patient was started on a Medrol dose pack and reintroduced to Rifampin. The patient's continued decline in respiratory status, accompanied by episodic fevers and worsening rash, prompted consultation with the ICU on February 12, 2023, resulting in immediate intubation. The patient underwent a bronchoscopy with a biopsy and sputum cultures were sent. Visualization of the lower respiratory system showed diffuse petechiae throughout and the bronchial biopsy was negative for malignancy. The final results of the cultures were ultimately negative, except for the presence of some yeast. The patient developed severe thrombocytopenia which further complicated the clinical picture.

Despite efforts including Cyclosporin, high-dose Solumedrol, and IVIG with platelet transfusion, the patient's respiratory status continued to deteriorate. In light of the limited therapeutic response, the family made the difficult decision to transition to comfort care. A.P. was extubated and subsequently passed away on March 3, 2023.

Discussion

Drug reaction with eosinophilia and systemic symptoms, or DRESS syndrome, is a rare and poorly understood disease with severe systemic manifestations and significant mortality risk. It was first recognized after hydantoin was introduced in the 1930s, and an increased number of patients who took it reacted with rash, fever, and eosinophilia. Since then, many other drugs have been found to cause a similar reaction, and there were many iterations in the nomenclature of the disease until drug reaction with eosinophilia and systemic symptoms was coined in the 1990s. It is estimated that DRESS syndrome has a mortality rate of up to 10% due to its significant multi-organ involvement [1]. The most common drugs linked to DRESS syndrome fall into the category of aromatic anticonvulsants such as phenytoin, carbamazepine, phenobarbitone, and sulfonamides. Carbamazepine is the most common cause of DRESS, but many other drugs in different drug categories have also been identified, including vancomycin, which is the insulting drug for this case [2].

The pathophysiology of DRESS syndrome is unknown, but there are many theories, and the mechanism may be multifactorial in nature. One theory suggests that patients more susceptible to DRESS may have specific mutations in drug-detoxifying-related genes [2]. Other theories have found associations between different racial groups and HLA haplotypes, and another possible mechanism could include the reactivation of a latent herpes virus [2]. Most of the research related to DRESS is specific to carbamazepine and other anticonvulsants, and thus, the exact mechanism of vancomycin-induced DRESS syndrome needs to be studied further.

One study found Vancomycin to be the most common culprit in antibiotic-induced DRESS syndrome within a small population. It is unclear whether this was due to increased vancomycin used in that hospital or an underlying susceptibility in that particular population [3]. Another case report issues a warning for orthopedic surgeons to be aware of late-onset rash for patients on long-term vancomycin post-surgery [4]. This case report and others could medically manage their patients with DRESS by immediate cessation of Vancomycin and initiation of corticosteroids and immunosuppressants [4-6]. Unfortunately, the patient in this case was not responding well to this treatment and had a sudden and rare instance of lung involvement in DRESS which developed into Acute Respiratory Distress Syndrome (ARDS) and contributed to her demise. It is possible that the patient could have benefitted from plasma exchange to remove the inflammatory cytokines causing the drug reaction. A few cases have been reported describing therapeutic plasma exchange's role in treatment-resistant DRESS [7-8].

Conclusion

The patient in this case presented with an unusually severe and highly treatment-resistant form of DRESS syndrome. The patient was not improving with high-dose steroid and cyclosporin treatments. They may have benefitted from plasma exchange, but their lung involvement, which is also rarely seen in DRESS, contributed significantly to their mortality. It is important to highlight the need for more awareness of Vancomycin-induced DRESS syndrome and

further exploration into nontraditional treatments, such as plasma exchange for these highly treatment-resistant forms of DRESS, to improve outcomes for future patients.

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Steven Iglesias - Writing, editing, & critical revisions

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