Vancomycin-induced DRESS syndrome treated with systemic steroids in a 16-year-old male

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Abstract
This is a case report of a 16-year-old patient with DRESS syndrome (Drug Reaction with Eosinophilia and Systemic Symptoms) associated with vancomycin who improved with systemic steroid treatment. DRESS syndrome is a life-threatening disease process typically secondary to medications, such as anticonvulsants, sulfonamides, and allopurinol. Vancomycin has also been associated with this condition. Apart from discontinuation of the offending agent, there are no clear treatment guidelines, but reports of improvement with systemic corticosteroids are described. We present a case of a 16-year-old male who had been on vancomycin for greater than 4 weeks before developing symptoms consistent with the diagnosis of DRESS syndrome. Our patient demonstrated marked improvement with systemic corticosteroids.

Keywords
Dermatology, DRESS syndrome, vancomycin

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Introduction
Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) is a life-threatening drug hypersensitivity reaction characterized by morbilliform skin rash, fever, lymphadenopathy, and eosinophilia.1 Internal organ involvement can occur, most commonly with liver involvement. The average age of patients with DRESS is 40 years, but it has been reported in the pediatric population.1–3 Anticonvulsants are common offending agents. In addition, viral infections, possibly from reactivation, are associated with DRESS syndrome. This is a case report of a 16-year-old patient with DRESS syndrome associated with vancomycin who improved with systemic steroid treatment.

Case presentation
A 16-year-old Caucasian boy was transferred from an outside facility with fever, rash, and sore throat. Prior to this admission, he had a right femoral osteotomy that was complicated by infection requiring irrigation and debridement and a prescribed course of intravenous vancomycin. He had completed over 4 weeks of vancomycin treatment via peripherally inserted central catheter. Two days prior to admission, the patient developed a rash that began on his shoulders and progressed to involve the entire body. The patient complained of facial edema, nausea, diarrhea, and a sore throat. A rapid strep test and antistreptolysin O (ASO) titers were negative. A respiratory viral panel was positive for rhinovirus/enterovirus polymerase chain reaction (PCR). Laboratory values demonstrated absolute eosinophilia (1000/mL) and an elevated alanine aminotransferase level (103). Physical examination revealed a diffuse morbilliform rash involving the upper extremities more than lower extremities, sparing the palms, soles, and mucous membranes. Vancomycin was changed to doxycycline. Over the course of 3 days, the patient continued to have fever, chills, and rising eosinophilia (peak 2000/mL). The rash became more confluent with overlying areas of purpura in areas of pressure such as the back and around the knee brace on his right leg (Figure 1). There were areas on the upper extremities progressing to vesicular lesions (Figure 2). Petechial lesions developed on the soft palate. Based on the RegiSCAR criteria, our patient met diagnostic criteria for
DRESS syndrome. Intravenous methylprednisolone (30 mg intravenous every 8 h) was started on the fifth day of admission. Within 12 h of introduction of steroids, the patient became afebrile with improvement in the rash. The patient’s rash continued to fade over the course of his hospital stay and he had no further fever. The patient was transitioned to an oral prednisone taper and discharged with oral doxycycline for osteomyelitis.

Discussion

DRESS syndrome is not commonly diagnosed in the pediatric population, and medical literature is sparse. The most common drugs associated with DRESS syndrome are anticonvulsants (carbamazepine, phenytoin, lamotrigine), allopurinol, and sulfonamides.1,4 Vancomycin has also been implicated.1,4 Proposed mechanisms include drug metabolism defect resulting in toxic reactive intermediates, reactivation of a viral trigger, or genetic predisposition with altered immune response.1,5–7

Patients typically present 2–6 weeks after initiation of the predisposing drug. The most common presenting symptom is a skin rash.1,4 Other common manifestations include fever, facial edema, and lymphadenopathy. Mucosal involvement can be present over half of the time.4 Laboratory analysis will often reveal hematologic abnormalities, most commonly eosinophilia followed by leukocytosis, neutrophilia, and atypical lymphocytosis.4 Other organ systems can be involved, most commonly the liver.1,4 Our patient demonstrated features consistent with this diagnosis.

The diagnosis of DRESS syndrome is largely based on the clinical presentation and typical symptoms. One of the more commonly used tools for the diagnosis of DRESS syndrome is the RegiSCAR criteria that includes three of the following: skin eruption (begins as morbilliform rash and progresses to confluent rash/involves more than 50% of body surface area), temperature > 100.4°F, lymphadenopathy in at least two sites, involvement of one of more internal organs, lymphocytosis or lymphocytopenia, blood eosinophilia > 10% or 700/µL, and thrombocytopenia.8 Our patient satisfied these criteria with a classic skin eruption, fever, internal organ involvement (elevated liver transaminases), and eosinophilia.

The average recovery time in one study was found to be 6.4 weeks.1 Pediatric case studies have reported resolution of rash within 1 week.9 Mortality rate has been reported as high as 10% in one large study.10

There are no specific treatment guidelines for patients diagnosed with DRESS syndrome beyond supportive care and discontinuation of potentially precipitating medications. Corticosteroids are often used, but this has not been validated in randomized trials. There is no standard dose and duration of systemic steroids in the medical literature.

We have presented a pediatric patient with DRESS syndrome. Our recommendation is that pediatricians be alert to this unusual disorder and understand the importance of discontinuing potentially precipitating medication and consider the use of systemic steroids for severe symptomatology.

Declaration of conflicting interests

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

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Informed consent

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References

1. Cacoub P, Musette P, Descamps V, et al. The DRESS syndrome: a literature review. Am J Med 2011; 124(7): 588–597.
2. Omairi NE, Abourazzak S, Chaouki S, et al. Drug reaction with eosinophilia and systemic symptom (DRESS) induced by carbamazepine: a case report and literature review. Pan Afr Med J 2014; 18: 9.
3. Kocaoglu C, Cilasun C, Solak ES, et al. Successful treatment of antiepileptic drug-induced DRESS syndrome with pulse methylprednisolone. Case Rep Pediatr 2013; 2013: 928910.
4. Kardaun SH, Sekula P, Valeyrie-Allanore L, et al. Drug reaction with eosinophilia and systemic symptoms (DRESS): an original multisystem adverse drug reaction. Results from the prospective RegiSCAR study. Br J Dermatol 2013; 169(5): 1071–1080.
5. Bocquet H, Boagot M and Roujeau JC. Drug-induced pseudolymphoma and drug hypersensitivity (Drug rash with eosinophilia and systemic symptoms: DRESS). Sem Cutan Med Surg 1996; 1: 250–257.
6. Criado PR, Criado RFJ, Avancini J, et al. Drug reaction with eosinophilia and systemic symptoms (DRESS)/drug-induced hypersensitivity syndrome (DIHS): a review of current concepts. An Bras Dermatol 2012; 87(3): 435–449.
7. Walsh SA and Creamer D. Drug reaction with eosinophilia and systemic symptoms (DRESS): a clinical update and review of current thinking. Clin Exper Dermatol 2010; 36: 6–11.
8. Kim DH and Koh YI. Comparison of diagnostic criteria and determination of prognostic factors for drug reaction with eosinophilia and systemic symptoms syndrome. Allergy Asthma Immunol Res 2014; 6(3): 216–221.
9. Buck ML. dress syndrome: examples from the pediatric literature. Pediat Pharmacother 2012; 18(11).
10. Chen YC, Chiu HC and Chu CY. Drug reaction with eosinophilia and systemic symptoms: a retrospective study of 60 cases. Arch Dermatol 2010; 146(12): 1373–1379.