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DRESS syndrome: carbamazepine induced anaphylactic shock

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1. Case presentation

A 51-year-old female of Southeast Asian ethnicity was referred to our neurosurgery service for a newly diagnosed intracranial meningioma. She underwent surgical excision of the tumor and was discharged home on carbamazepine. Four weeks later, she presented back to our emergency department (ED) with fever, generalized rash, and altered mental status. The rash appeared a week prior to the patient's presentation to the ED, and she complained of spikes of fever for two days. On arrival, her temperature was 41 °C. She was tachypneic at 24 breaths/min, and hypotensive at 95/55 mmHg, with a heart rate of 120 beats per minute. Soon after triage, she was moved to the resuscitation room for further assessment and management.

On examination, the patient appeared to be in moderate distress, anxious, and slightly confused with a Glasgow Coma Scale of 14/15. She had a generalized, macular, pruritic, urticarial rash with irregular confluent margins that was consistent with an allergic reaction. Apart from the above-detailed findings, her examination was unremarkable. There was no mucosal surfaces involvement. Her chest was clear on auscultation. Her abdomen was soft, non-tender, with no organomegaly. No focal neurological deficits were detected.

Her investigations included a full septic panel. Laboratory workup revealed elevated liver function tests [Alkaline Phosphatase of 120 IU/L (normal range 35 – 104), Aspartate Transaminase of 65 IU/L (normal range < 32), Alanine Aminotransferase of 82 IU/L (normal range < 33)], Lactate Dehydrogenase of 367 IU/L (normal range 135 – 214), Procalcitonin of 1.01 ng/mL (normal range < 0.5), and C-Reactive Protein (CRP) of 150.2 mg/L (normal range < 0.5). Of note, she had no leukocytosis nor eosinophilia.

The patient's empirical treatment plan in the ED included the administration of intravenous (IV) fluids, antihistamines, and ceftriaxone. Upon admission, she was commenced on IV dexamethasone 4 mg twice a day. Additionally, carbamazepine was stopped immediately.

The day following her admission, the patient's lab work was repeated, and it showed an improvement in CRP, but most notably, her differential complete blood count revealed eosinophilia of 0.73×10^9/L (normal range < 0.7), which further went up to 1.33×10^9/L two days later. She was also reviewed by the dermatologist and a skin biopsy was proposed. However, the patient did not consent to the procedure. On day 3 of her admission, the patient clinically improved on treatment and remained afebrile and vitally stable. She was therefore discharged home with a follow-up clinic appointment.

2. Learning points

Drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome is a severe cutaneous reaction that accompanies visceral involvement as a response to various medications including Antiepileptics, Antimicrobials, and Anti-inflammatories (1). The incidence of DRESS syndrome in the USA is 2.18 per 100,000 patients (2). DRESS poses a diagnostic dilemma to clinicians as symptoms appear to be latent in onset and may begin 4-6 weeks following the initiation of the offending drug (3). Manifestations of DRESS syndrome include fever, skin erythema with maculopapular rash eruption, hematologic abnormalities (e.g. peripheral eosinophilia), lymphadenopathy, as well as multiple organ involvement including kidney and liver (4).

The pathogenesis is still not entirely understood but is thought to involve genetic predisposition to a drug-specific immune response, along with reactivation of human herpesviridae virus with subsequent antiviral immune response (5). A proven association exists between certain human leukocyte antigen (HLA) genes and the susceptibility to development of DRESS syndrome (6).

The literature describes stopping the offending drug immediately as the cornerstone of DRESS syndrome treatment. In severe presentations, systemic corticosteroids are viewed as the treatment of choice, which lead to rapid resolution of symptoms as well as clinical improvement within days of therapy (1).

It is further important to recognize that eosinophilia can be delayed, transient, or might not show up in 10-50% of DRESS syndrome cases (7). Therefore, frequent monitoring of differential blood count may be indicated in order not to miss transient eosinophilia. Additionally, the absence of eosinophilia does not exclude the diagnosis in presence of a strongly sug-

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gestive clinical picture.

3. Declarations

3.1. Acknowledgement

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3.2. Authors' contribution

YH drafted the article. AN and MM contributed to manuscript writing and offered significant feedback. All authors read and approved the final version of the manuscript. YH is the guarantor of the article.

3.3. Conflict of interest

The authors have no conflicting interests to declare.

3.4. Funding

Not applicable

3.5. Consent for publication

Patient's consent for publishing the case with no identifiable personal information was obtained.

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