Case report

Valproate and Pediatric Stevens-Johnson Syndrome: A Critical Alert

ABSTRACT

Stevens-Johnson Syndrome is a severe condition that affects the skin and mucous membranes, often caused by medications or infections. This case study details the experience of a three-year-old boy who developed SJS after beginning valproate treatment for seizure management following a traumatic brain injury. Initially, he showed symptoms of fever, facial redness, and a runny nose, which progressed to a severe rash and blisters. A dermatologist confirmed the diagnosis of SJS linked to valproate. Swift diagnosis, discontinuation of the offending drug, and supportive care are essential in managing SJS and preventing serious complications. Early intervention and comprehensive care from a variety of medical professionals are crucial for improving patient outcomes.

Keywords: Steven Johnson Syndrome, Valproate, Neurology.

1. INTRODUCTION

Stevens-Johnson syndrome (SJS) is a rare but serious disorder affecting the skin and mucous membranes. Typically triggered by a reaction to medication or an infection, SJS is characterized by a painful rash that spreads and blisters, leading to the top layer of skin shedding and falling off. This condition requires immediate medical attention, as it can lead to severe complications, including infections, dehydration, and organ damage. Early diagnosis and treatment are crucial for improving outcomes and preventing lasting damage [1].

Stevens-Johnson syndrome often begins with flu-like symptoms such as fever, sore throat, and fatigue, followed by a red or purplish rash that spreads and forms blisters. These blisters can cause the skin to peel and affect the mucous membranes, including those in the mouth, eyes, and genitals. In severe cases, it can progress to toxic epidermal necrolysis (TEN), a more severe form of SJS where more than 30% of the body surface area is affected. Immediate discontinuation of the offending drug and supportive care in a hospital setting, often in an intensive care unit or burn unit, are essential for management [2].

2. CASE REPORT

A three-year-old boy pediatric patient comes to the emergency department complaining of fever, facial redness, and runny nose. After introducing valproate due to a previous history of seizures and a history of jerking both limbs the patient developed facial redness, which involved the entire body on day four in the hospital. The patient is a known case of traumatic brain injury fall from the fifth floor in September 2022—developed seizures after acquired brain injury fall. There is no significant family history, personal history, or travel history. Current medication includes Levetiracetam, Valproate, Citicoline, and piracetam. A general examination pulse was 76 per minute, no available blood pressure, respiratory rate of 25 per minute, temperature was 36.2°C, weight was 18.8 kg, and appearance was distressed. On physical examination, there were no complaints of chest pain, palpitations, or cough, the abdomen was soft, non-tender, with no abdominal distension, alert oriented to please person time, please person time, quadriparesis, Spasticity with reduced speech output, Redness over the body.

Diagnostics were ordered EEG which revealed electrographic seizures, C-reactive protein (CRP): 6.3 mg/L (Reference range is Less than 5 mg/L), and Complete blood count revealed low platelet level 59 - 10^3 /uL (normal reference level is 200-490 10^3 /uL), and WBC count low 3.7 10^3 /uL (normal reference level is 5-15 10^3 /uL). Aspartate aminotransferase (AST) 139 which is high (Reference range is up to 50), and Alanine aminotransferase (ALT) 116 which

is high (Reference range is up to 50). Kidney function test showed a low sodium level which was 131.5 (Reference range is 136-145 mmol/L), and Albumin was low at 3.64 (Reference range is 3.8-5.4 mmol/L).
After a Consultation with a Dermatologist Steven Johnson Syndrome was given as diagnosis due to the intake of valproate.

3. DISCUSSION

Stevens-Johnson Syndrome (SJS) is a rare life-threatening condition characterized by severe mucocutaneous epidermal necrolysis and detachment of the epidermis. The disease is characterized by a delayed-type hypersensitivity reaction, also known as Type IV hypersensitivity, which has a complicated etiology from several sources [3].

Symptoms appear after 1-3 weeks after exposure to the drug, with mucosal involvement, two or more layers are affected in 85% of the cases which results in severe cutaneous reaction [4]. Diagnosing SJS in its early stages is extremely difficult, resulting in a delay in treatment due to non-specific symptoms such as fever, malaise, sore throat, and cough [5].

Pathogenesis of SJS is not fully understood although it includes type 4 hypersensitivity as mentioned earlier. There are multiple mechanisms to explain the pathophysiology of the syndrome. One among them is HLA phenotypes. When triggers attach to HLA peptides, it can activate the immune response, leading to SJS [3].

Patients clinically experience nonspecific symptoms after getting exposed to triggers which are: fever, cough, rhinitis, sore eyes, and myalgia. After three to four days severe dermatological symptoms start to appear: flaccid bullae, large painful erosions, purpuric macules, and Positive Nikolsky sign. Nikolsky sign is shedding of the epidermis due to lateral pressure on the skin [1]. Oral involvement is frequent, with mucositis and ulceration occurring in nearly all cases. During the acute phase, ocular symptoms affect 50-88% of patients, ranging from conjunctivitis, eyelid swelling, redness, crusts, and discharge, to more severe conditions such as conjunctival or corneal membrane formation, ulceration, and potential complications like symblepharon and corneal lesions [7].

The diagnosis is confirmed with the help of a skin biopsy. Treatment consists of prompt medication discontinuation, supportive treatment, and possible transfer to a burn unit. SJS mortality rates are less than 10%, but TEN mortality rates range between 30 and 50%, treatment with immunosuppressive and immunoglobulins showed drastic improvement in patients as it remains debatable [8]. Complications of SJS are sepsis in the acute phase. Long-term complications include blindness, cutaneous(pigmentary changes and scarring), and renal. Mucosal involvement with blisters and erosion can lead to strictures and scarring example esophagus [1].

4. CONCLUSION

In this case, a three-year-old boy presented with Stevens-Johnson syndrome (SJS) after the administration of valproate for seizure management following a traumatic brain injury. SJS, while rare, is a severe condition that necessitates prompt recognition and treatment. The initial presentation with fever, facial redness, and a runny nose, combined with a significant history of seizures and valproate usage, raised suspicion for SJS, confirmed by dermatology consultation.

Management of SJS involves immediate discontinuation of the offending drug, in this case, valproate, and the initiation of supportive care to manage symptoms and prevent complications. The complexity of SJS's pathophysiology, involving immune-mediated keratinocyte apoptosis, underscores the importance of early diagnosis and intervention to improve patient outcomes. Despite its rarity, healthcare providers must remain vigilant for SJS signs, particularly in patients receiving medications known to trigger this syndrome.

This case underscores the importance of considering SJS in pediatric patients with skin and mucous membrane involvement following drug administration. Early dermatological consultation and multidisciplinary care are crucial for managing this life-threatening condition effectively. Further research and awareness are essential to understand better the risk factors and mechanisms underlying drug-induced SJS and to improve prevention and treatment strategies.

Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

Consent

As per international standards, parental written consent has been collected and preserved by the author(s).

Disclaimer (Artificial intelligence)

Author(s) hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during the writing or editing of manuscripts.

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