A Case of Generalized Seizure after Toxic Epidermal Necrolysis

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Toxic epidermal necrolysis (TEN) is a severe mucocutaneous adverse reaction characterized by extensive necrosis and epidermal detachment involving more than 30% of the body surface area (BSA). It is commonly triggered by antiepileptics, sulfonamide antibiotics, and non-steroidal anti-inflammatory drugs. A 22-year-old female without any underlying medical history presented with painful multiple erythematous bullae and plaques of varied sizes throughout the body for 1 day. On the second hospitalization day (HD), the bullae progressively coalesced, leading to epidermal detachment involving 60% of the BSA. On the fifth HD, the patient had a tonic-clonic seizure with eyeball deviation for 5 minutes. She was transferred to the intensive care unit (ICU) and administered lorazepam 4 mg and levetiracetam 1,500 mg. Brain computed tomography, magnetic resonance imaging, and cerebrospinal fluid examination showed no abnormalities. Although the patient had delirium and additional seizures while in the ICU, her condition improved without any complications after 5 weeks of inpatient treatment. Several complications of TEN such as dehydration, malnutrition, sepsis, and ophthalmic and pulmonary complications have been reported; however, seizures have not been reported yet. Herein, we report a case of seizure in a patient during treatment for TEN.

Keywords: Seizures, Stevens-Johnson syndrome

INTRODUCTION

Toxic epidermal necrolysis (TEN) is a severe mucocutaneous adverse reaction characterized by extensive necrosis and detachment of the epidermis involving more than 30% of the body surface area (BSA)1. It is most commonly caused by antiepileptic drugs such as lamotrigine, phenytoin, and carbamazepine2. There are many kinds of complications of TEN including sepsis, multiorgan failure, and pulmonary and ophthalmic complications3. To the best of our knowledge, cases of seizure after the onset of TEN have not yet been reported.

We received the patient’s consent form about publishing all photographic materials.

CASE REPORT

A 22-year-old female presented with painful multiple erythematous bullae and plaques of various sizes on her entire body for 1 day (Fig. 1A, B). Five days ago, she had taken acetaminophen and nortriptyline for headache. Two days ago, she had taken ibuprofen and amoxicillin/clavulanate for fever and headache. We performed viral laboratory test and punch biopsy from the bullous lesion. Nikolsky’s sign was positive, and about 60% of the BSA was involved (Fig. 1C, D). The patient was administered methylprednisolone 2 mg/kg, and the areas of epidermal
TEN is a life-threatening cutaneous condition affecting the skin and mucous membranes. Patients can be classified according to the BSA involved: Stevens-Johnson Syndrome (SJS), <10% BSA; SJS/TEN overlap, 11% ~ 30% BSA; and TEN, >30% BSA. Although the pathophysiology of TEN is unknown, medications are known to be the most important causative factors, especially antiepileptic drugs such as carbamazepine, lamotrigine, phenytoin, and phe nobarbital. The cutaneous lesions are characterized by irregularly shaped erythematous to dusky red maculopatches, blisters, and diffuse erythema. Mucous membranes are involved in more than 90% of patients who develop TEN. Under the assumption that many immunological mechanisms affect the progression of the disease, many kinds of immunosuppressive and anti-inflammatory agents have been attempted to arrest its progression. A high dose of systemic steroids could lead to an increased risk of infection. Although intravenous immunoglobulin and cyclosporine A can also be used, their exact effects on disease progression are unclear. During the acute phase, many complications of TEN such as dehydration, malnutrition, sepsis, and ophthalmic and pulmonary complications could occur. Sepsis due to Staphylococcus aureus and Pseudomonas aeruginosa is the most common. Extensive fluid loss due to epidermal detachment results in dehydration and electrolyte imbalance. Approximately 20% to 75% of patients develop ophthalmic complications, whereas about 40% of patients...
develop pulmonary complications including edema, atelectasis, and pneumonitis. Epithelial defects and ulceration caused by ocular surface inflammation may cause visual impairment and eye discomfort. However, neurologic complications of TEN including seizure have not yet been reported.

The causes of seizures are epilepsy, brain injury, infection, drugs, metabolic disorder, fever, and stress. In the patient in the current case, the possible causes of seizure could have been metabolic disorder, stress, and medication. Dehydration, the main complication of TEN, can modify plasma osmolality and electrolyte balance, altering brain metabolism and function, leading to increased risk of seizure. Exposure to stress results in secretion of hormones such as deoxycorticosterone, corticotropin-releasing hormone, and corticosterone, which impact neuronal excitability and seizure susceptibility. The medications used to control symptoms including high-dose corticosteroids, acyclovir, and moxifloxacin could lead to seizure. Moxifloxacin, which is administered to treat urinary tract infection, has been reported to cause TEN as well as seizures. According to previously reported cases, the seizures stopped after moxifloxacin was discontinued. In this case, the seizures continued despite the withdrawal of moxifloxacin, the possibility of the seizure being induced by moxifloxacin was low.

Although cases of TEN due to antiepileptics are common, cases of seizures during treatment of TEN have not been reported. Herein, we report a rare case of TEN with seizure in a patient without any personal or family history of seizure. As TEN is a life-threatening disease, the possibility of seizure should be considered in patients with TEN.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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REFERENCES

1. Bastuji-Garin S, Rzany B, Stem RS, Shear NH, Naldi L, Roujeau JC. Clinical classification of cases of toxic epidermal necrolysis, Stevens-Johnson syndrome, and erythema multiforme. Arch Dermatol 1993;129:92-96.
2. Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, Wolff K. Fitzpatrick’s dermatology in general medicine. 8th ed. New York: McGraw-Hill Education, 2012.
3. Lee HY, Walsh SA, Creamer D. Long-term complications of Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN): the spectrum of chronic problems in patients who survive an episode of SJS/TEN necessitates multidisciplinary follow-up. Br J Dermatol 2017;177:924-935.
4. Hoetzenecker W, Mehra T, Saulite I, Glatz M, Schmid-Grendelmeier P, Guenova E, et al. Toxic epidermal necrolysis. F1000Res 2016;5. doi: 10.12688/f1000research.7574.1.
5. Harr T, French LE. Toxic epidermal necrolysis and Stevens-Johnson syndrome. Orphanet J Rare Dis 2010;5:39.
6. Goldenberg MM. Overview of drugs used for epilepsy and seizures: etiology, diagnosis, and treatment. P T 2010;35: 392-415.
7. Nardone R, Brigo F, Trinka E. Acute symptomatic seizures caused by electrolyte disturbances. J Clin Neurosurg 2016;12: 21-33.
8. Maguire J, Salpeter JA. Stress, seizures, and hypothalamic-pituitary-adrenal axis targets for the treatment of epilepsy. Epilepsy Behav 2013;26:352-362.
9. Ruffmann C, Bogliun G, Beghi E. Epileptogenic drugs: a systematic review. Expert Rev Neurother 2006;6:575-589.
10. Shi J, Xu H. Moxifloxacin induced seizures- a case report. Iran J Public Health 2014;43:1291-1294.