

# Toxic epidermal necrolysis induced by lamotrigine treatment: A case report

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Case report

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## Background

**Objective:** To describe a case report of toxic epidermal necrolysis due to treatment with lamotrigine.

**Introduction:** Toxic epidermal necrolysis (NET) is a rare and life-threatening dermatological disease characterized by severe affection of the skin and mucous membranes. NET is considered a severe form of adverse drug reaction (RAF) and occurs as a result of exposure to drugs that may act as antigens, stimulating the immune response and causing an inflammatory response in the skin and mucous membranes.

**Case description:** 47-year-old female patient with lamotrigine treatment, diagnosed with post-treatment toxic epidermal necrolysis, required ICU hospitalization with surgical debridement, systemic steroids and topical calcium alginate being discharged home after 2 weeks of treatment.

**Conclusion:** The diagnosis of toxic epidermal necrolysis must be early identified and with multidisciplinary management. NET treatment focuses on life support and prevention of secondary infections, and may include the use of intravenous immunoglobulins (IVIs) and other immunomodulatory treatments.

**Keywords:** Lamotrigine, toxic epidermal necrolysis.

**T**oxic epidermal necrolysis (NET) is a severe, life-threatening skin reaction characterized by loss of the surface layer of the skin and mucous membranes. NET is considered a severe form of adverse drug reaction (RAF), which can be triggered by various drugs and has a variable incidence according to the population studied. NET is also known as Stevens-Johnson syndrome (SSJ) and toxic epidermal necrolysis and is considered a medical emergency. Affected patients require immediate treatment in intensive care units and in some cases may need long-term care to address long-term complications.

## Case report

A 47-year-old female patient, who had a history of significant cerebral vascular event in March 2022, was later treated with sertraline and clonazepam. Subsequent evaluation by neurology indicated treatment with lamotrigine for episodes of altered state of consciousness.

He began his current condition 2 weeks after starting treatment with lamotrigine, on February 17, 2023, with generalized cutaneous erythema, predominantly in thorax, in addition to thermoesthesia.

After 72 hours, generalized burning pain of severe intensity was added, which made it difficult to perform daily activities, in addition to generalized blistering lesions and ulcers in the oral mucosa, after that findings is admitted to the emergency department and treatment is started with prednisone and antihistamines. On February 25 she was admitted to the intermediate care therapy area with a diagnosis of toxic epidermal necrolysis (40% of total body surface area), is evaluated by plastic and reconstructive surgery performing debridement of posterior chest and arms on 28 February and 1 March.

She was admitted to the Intensive Care Unit on March 10, 2023, with lesions in epithelialization process, with a total body area of about 80% in the anterior and posterior thorax, buttocks, face, neck and ears (Fig. 1).

On admission, laboratories on March 17, 2023 reported Glucose 94 mg/dL, Creatinine 0.39 mg/dL, Sodium 139 mEq/L, Potassium 3.5 mEq/L, Chlorine 100 mEq/L, Leukocytes 12.7, Hemoglobin 9.6 g/dL, Platelets 509, Neutral 63.2%.

Evaluation by dermatology is requested indicating management with prednisone 40 mg every 24 hours and hydroxyzine 20 mg every 24 hours.

Evaluation is also requested from the general surgery service for surgical debridement, a procedure



**Figure 1.** A. Anterior chest, lateral neck. B. Anterior thorax, neck and arms. C. Anterior chest involvement.

that is performed on March 12, 2023, reporting 80% of the total body surface involvement, dry necrotic tissue in ears, face and anterior thorax, performing surgical debridement without eventualities. (Fig. 1)

Treatment is continued in intensive care unit, with daily wound care, topical management based on carboxymethylcellulose / calcium alginate gel. During your stay it is kept with painkillers. The patient underwent an adequate postoperative evolution with improvement of the body surface wounds and is discharged home (Fig. 2).

## Discussion

Toxic epidermal necrolysis (NET) is a rare and life-threatening dermatological disease characterized by severe affection of the skin and mucous membranes. NET is considered a severe form of adverse drug reaction (RAF) and occurs as a result

of exposure to drugs that may act as antigens, stimulating the immune response and causing an inflammatory response in the skin and mucous membranes.

Since it was first described in the 1950s, the NET has been of great interest to the scientific community because of its complexity and gravity.

NET is included in a spectrum of diseases known as Stevens-Johnson syndrome (SJS), ranging from mild to severe forms of skin rash and skin and mucosal necrosis (1). In general, SJS is considered to affect less than 10% of the body surface, SJS overlap affects 10% to 30% and NET affects more than 30% of the body surface.

NET is characterized by epidermal necrosis and the formation of blisters on the skin, which often break off leaving areas of bare skin. Necrosis also affects mucous membranes, such as those of the mouth, eyes, throat, and genitals. Patients with NET



**Figure 2.** A. Anterior face of thorax after debridement. B and C. Anterior thorax after surgical debridement.

have fever, general discomfort, pain, and skin redness (2).

Although the prevalence of NET is low, the disease is of great medical interest due to its high mortality rate and its impact on patients quality of life (3). In recent years, there has been an increase in the incidence of NET worldwide, which has generated concern in the medical community (4).

Available epidemiological data indicate that NET affects all ages and ethnic groups, but there is a slight predominance in women and young adults (5). The incidence of NET varies by geographical region, but is estimated to range from 0.4 to 1.2 cases per million people per year in most countries (2). Although NET can occur at any time of the year, some studies suggest that there is a higher incidence in spring and summer (6).

Although its etiology is not fully understood, drugs and infections have been shown to be the main triggers of this disease (7). A significant association has been reported between certain drugs and NET, including anticonvulsants, antibiotics, non-steroidal anti-inflammatory drugs and drugs used to treat autoimmune diseases, such as lupus and rheumatoid arthritis (8).

According to current scientific literature, lamotrigine has been associated with an increased risk of toxic epidermal necrolysis (NET) compared to other antiepileptics. In an observational cohort study conducted in Taiwan, lamotrigine use was found to be associated with an increased risk of NET compared to other antiepileptics, with an incidence of 1.5 cases per 10,000 patients treated with lamotrigine compared with 0.5 cases per 10,000 patients treated with other antiepileptics (9).

Another case-control study in France found that lamotrigine was significantly associated with increased NET risk, with an OR of 3.3 (95% CI 1.5-7.4) after adjusting for other risk factors (10).

The shedding of the epidermis and the formation of blisters are the result of the destruction of skin cells by activated cytotoxic T lymphocytes (11). It is important to note that not all patients taking the above medicines will develop NET and that the disease may occur with other drugs not mentioned here. Therefore, an individualized evaluation of each suspicious case is required to determine the causal relationship with a particular drug.

The treatment of toxic epidermal necrolysis (NET) is based on the interruption of the suspect drug and on care in a center specialized in burns and intensive care. Overall, NET treatment focuses on life support and prevention of secondary infections and may include the use of intravenous immunoglobulins (IVIs) and other immunomodulatory treatments (11).

It is important to note that NET treatment is a complex process that requires a multidisciplinary and personalized approach for each patient, and that treatment approaches may vary depending on the severity of the disease and the presence of complications.

## Conclusion

Toxic epidermal necrolysis (NET) is a rare but severe disease that can be triggered by exposure to certain medications and in some cases by infections. It mainly affects the skin and mucous membranes and fatal if not treated in time and appropriate manner.

In this medical article, we reviewed the available scientific literature on NET, including epidemiology, risk factors, pathogenesis, clinical

manifestations, diagnosis and treatment. The importance of early identification of the disease has been highlighted, as well as the multidisciplinary management of affected patients, involving dermatologists, intensivists and other specialists as needed.

In conclusion, toxic epidermal necrolysis is a severe disease that requires multidisciplinary management and aggressive treatment. Early identification of symptoms and use of accurate diagnostic tools is essential to ensure optimal management of patients. Prevention of NET by identifying and avoiding known risk factors is also a key aspect of managing this disease.

## Conflicts of interests

We declare no potential conflicts of interest of any of the authors in this scientific report.

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