Case Report

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Toxic Epidermal Necrolysis as a Result of Hair Dye Allergy

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Abstract

More cases of hair dye allergy and poisoning are being presented to the Emergency Department (ED). There were rare TEN cases due to the hair dye in the literature. An 18-year-old female presented to our ED with the complaint of a common rash in her whole body, edema on her face that closed her eyes, and blisters on her face and neck. Her relatives reported that she dyed her hair 4 days ago 5 times in 24 hours. her initial vital signs were as follows: Blood pressure: 90/55 mmHg, Heart Rate:128 beats /min, Respiratory Rate: 18 beats/min, Oxygen saturation:100%, Body Temparature:40.3 2C. According to her history and physical examination, she was diagnosed with toxic epidermal necrolysis. According to starting the appropriate treatment modalities immediately in ED, she was discharged with full recovery in spite of her high predicted mortality. Although emergency medicine physicians encounter TEN patients infrequently, they must be aware of and initiate the appropriate treatment modalities immediately

Keywords: Hair dye allergy, toxic epidermal necrolysis, emergency department

Introduction

In our developing world, the use of hair dye is increasing throughout all age groups, from children to the elderly. Due to this trend, more cases of hair dye allergy and poisoning are being presented to the Emergency Department (ED). The most popular and preferred hair dyes are permanent hair colors which include P-Phenylenediamine (PPD), hydrogen peroxide (usually a 6% solution form), and Propylene glycol(1). Due to P-henylenediamine's high allergic and toxigenic effects, 1 to 6 % of all dermatitis patients all around the world were reported due to the hair dyes containing PPD (2).

Toxic Epidermal Necrolysis (TEN) is defined as an immune-mediated mucocutaneous disease characterized by the detachment of the epidermis and mucous membrane. It is also named 'immunologic burn' because of the same appearance of skin as a burn. The main causes are drugs (allopurinol, carbamazepine, phenytoin, sulfasalazine, sulfonamides, and non-steroidal anti-inflammatory drug) and infections (3). The severity-of-illness score for TEN (SCORTEN) is used to predict mortality (Table 1) (4). Clinical features including fever, sore throat, and malaise accompany the dermatologic symptoms of blisters and vesiculobullous rash with epidermal sloughing and necrosis. Herein we present a case in that hair dye allergy mutated to TEN.

Case Report

An 18-year-old female presented to our ED with the complaint of a common rash in her whole body, edema on her face that closed her eyes, and blisters on her face and neck. Her relatives reported that she dyed her hair 4 days ago 5 times in 24 hours. This was the third ED presentation over the course of three days. On her first presentation, 3 days ago; she had urticarial plaques on her body and extremities; she was treated with intravenous antihistaminics (pheniramine hydrogen maleate 45.5 mg) and discharged with the oral antihistaminic drugs (cetirizine and clemastine). After 24 hours, she presented to the ED due to a worsening of her symptoms. Because of the recurrent visit in 24 hours, she was consulted with the Dermatology and they rearranged her oral antihistaminic drugs and scheduled a control exam for two days later. On the 3rd admission, her initial vital signs were as follows: Blood pressure: 90/55 mmHg,

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Table 1: Risk factors, scores and mortality prediction of SCORTEN

Risk factors for SCORTEN "Score of Toxic Epidermal Necrosis"	
Age over 40 years	
Heart rate >120 beats per minute	
Presence of cancer or hematologic malignancy	
Epidermal detachment area involving body surface area >10%	
Blood urea nitrogen >28 mg/dL (10 mmol/L)	
Blood glucose >252 mg/dL (14 mmol/L)	
Bicarbonate <20 mEq/L	
Mortality rate in SCORTEN	
Number of risk factors	**Mortality rate (%)**
0–1	3.2
2	12.1
3	35.3
4	58.3
5	90

Heart Rate:128 beats /min, Respiratory Rate: 18 beats/min, Oxygen saturation:100%, Body Temparature:40.3 2C. Her Glasgow Coma Scale score was 15 and she was oriented and cooperated. Her respiratory system examination was normal. Her dermatologic examination revealed a severe, painful erythematous rash all across the surface of her whole body, including her extremities, as well as partially bullous lesions on her face and neck, as well as bilaterally enlarged eyelids that made it difficult for her to open her eyes (Figure 1).

According to her history and physical examination, she was diagnosed with toxic epidermal necrolysis. Her blood tests revealed a BUN of 14.8 mg/dl, blood glucose of 95 mg/dl, and HCO3 of 21.7 mEq/L. The SCORTEN score was calculated as 2 yet the mortality was predicted over 50% because of the involvement of the whole body. Isotonic saline infusion, 45.5 mg pheniramine hydrogen maleat, 250 mg methylprednisolone, and analgesics (paracetamol and fentanyl) were administered immediately and she was consulted with the dermatology, intensive care, and ophthalmology departments. Dermatology and ophthalmology departments recommended adding oral 100 mg of cyclosporin, topical mupirocin, polyvinyl alchol+povidon eye drop, moxifloxacin HCL as an ophthalmic solution, carbomer ophthalmic gel to the medical treatment and hospitalization in the burn intensive care. She was hospitalized in Burn intensive care for 17 days and in the dermatology ward for 22 days and was treated with a combination of methylprednisolone, cyclosporin, and immune globulin. On the fortieth day of the hospital stay, she was discharged with a full recovery of her lesions.

Discussion

TEN is a dermatological emergency characterized by diffuse epidermal necrolysis and the involvement of two or more mucosal surfaces. Additionally, the respiratory, gastrointestinal, genitourinary and renal systems might be affected (5). The most common trigger agents for TEN are drugs especially antibiotics, antiepileptics, allopurinol, and immune checkpoint inhibitors. In the absence of a definitive pathophysiological mechanism, it is assumed that T-cells activation by medications or infection plays a role in the formation of TEN. Our patient did not take any drugs however but she did color her hair five times within 24 hours. There were several case reports about hair dye poisoning in the literature ranging from basic urticaria to anaphylactic shock. According to our knowledge, no TEN cases have been linked to hair dyes. It is important to immediately start the fluid resuscitation, antipyretic, corticosteroid, and cyclosporin with the dermatology consultation. The TEN patients must be monitored in intensive care units and if it is possible in burn intensive care. The TEN patients receive the same supportive care as burn patients. Particular attention should be paid to the respiratory and cardiovascular organ systems.

Conclusion

Although emergency medicine physicians encounter TEN patients infrequently, they must be aware of and initiate the appropriate treatment modalities immediately. In addition, the management of these patients consists of multidisciplinary teams.

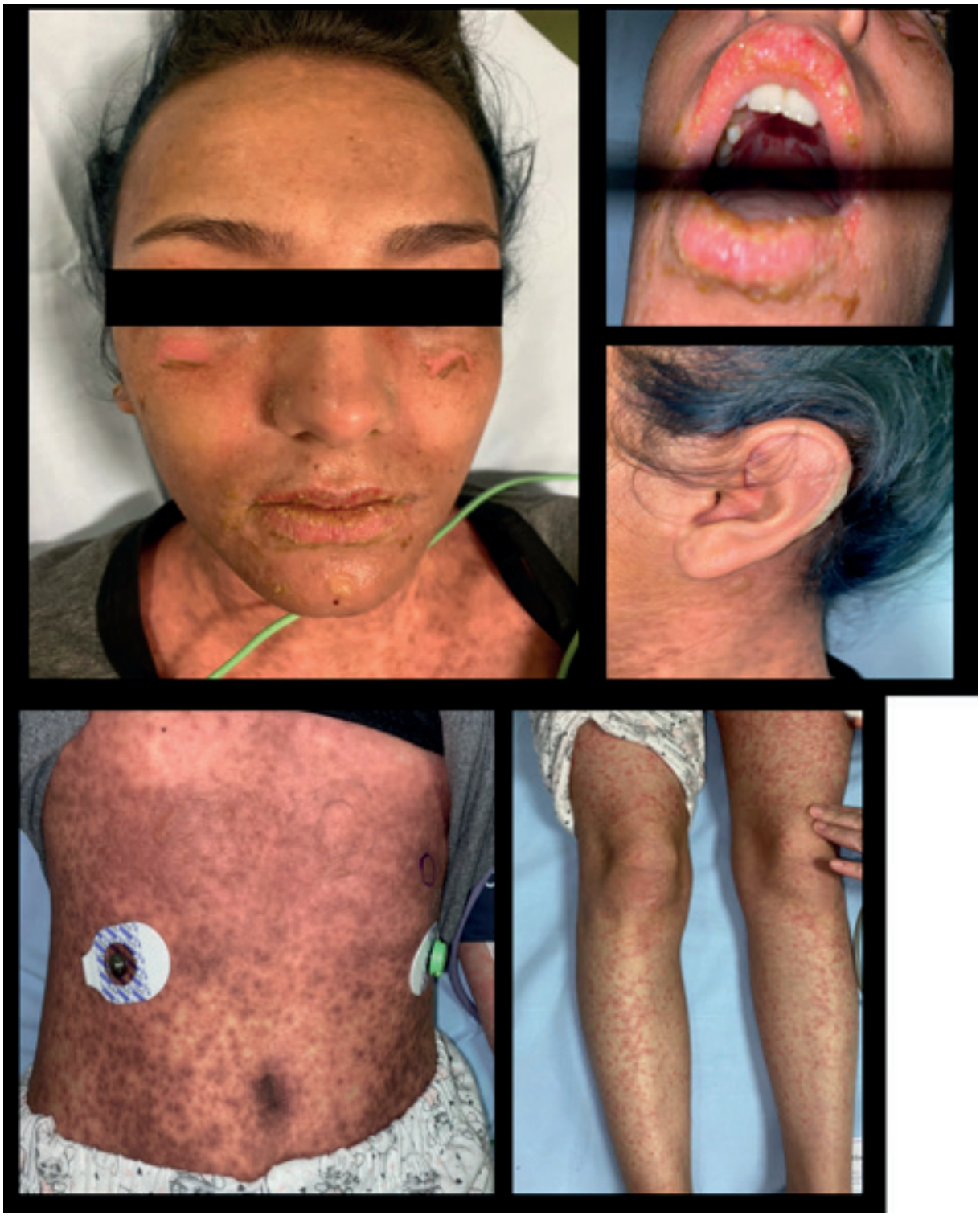

Figure 1. Computed tomography angiography (CTA) of the left hand

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