Case Report

Toluene-induced erythrodermic lichen planus

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ABSTRACT

Lichen planus is an inflammatory disease that affects the skin and mucous membrane. The exact etiology is unknown, but it is considered an immunologically mediated disease toward unrecognized antigen possibly located at the basal cell layer. Many clinical variants are recognized. Lichen planus-like lesions can be seen in chronic versus host disease, drugs, and chemicals. Here, we report a new case of a male patient who was exposed to toluene-containing compounds after which he developed an erythrodermic eczematous and lichenoid eruption, which is to the best of our knowledge, the third case of toluene-induced lichen planus reported worldwide and the first case in our country.

Key words: Erythrodermic lichen planus, Lichen planus, Toluene

Lichen planus (LP) is an inflammatory papulosquamous disease that affects the skin and mucous membrane, affecting 0.2–1% of the general population worldwide [1]. The exact etiology is unknown, but it is considered an immunologically mediated disease toward unrecognized antigen possibly located at the basal cell layer [1]. Many clinical variants are recognized such as classical, annular, follicular, linear, acute and subacute, bullous, pigmented, atrophic, hypertrophic, vulvovaginal–gingival, inverse lichen planus pigmentosus, lichen planopilaris, guttate, oral, nail types, and drug-induced [1,2]. The classical type is presented as pruritic plane purple polygonal papules that favor the wrists, genitalia, forearms, presacral area, and distal lower extremities [1]. Mucosal involvement is observed in up to 75% of patients with cutaneous LP, but mucosal LP can be the only manifestation of the disease. The patients who presented with oral LP will develop cutaneous LP in 10–20% of patients only [1]. Histologically, there is a dense, band-like lymphocytic infiltrate with the destruction of the epidermal basal cell layer, and keratinocyte apoptosis.

CASE REPORT

A 45-year-old male patient who works as a driver of a long vehicle in Basra Oil Company, consulting the outpatient dermatology clinic of Basra teaching hospital complaining of generalized severely itchy skin rash for the 1-month duration a few weeks after frequent exposure and contact with toluene-containing compound. History taking revealed a negative family history of a similar condition; in addition, he has neither chronic relevant systemic diseases nor any drug intake.

On examination, the patient looked generally well. All vital signs were normal and there was generalized erythrodermic eczematous and lichened eruptions (Fig. 1). No mucus membrane, hair and nail involvement, no lymphadenopathy, and no organomegaly were detected.

Investigation, including complete blood count, blood film morphology, liver function test, renal function test, and serology, were normal. Skin biopsy showed hypergranulosis, liquefactive degeneration of basal cell layer, and band-like intense inflammatory lymphocytic cell infiltrate at the upper dermis with pigmentary incontinence (Fig. 2). The histopathological features confirmed the diagnosis of acute or subacute lichen planus.

Accordingly, the patient was advised to avoid further exposure to toluene containing compounds by any means with reported instructions to his company regarding this issue, meanwhile kept on a small dose of systemic steroid (prednisolone 20 mg daily) for 7 days, systemic antihistamine, and topical emollient and moderately potent topical steroid, by which all the lesions were resolved.

DISCUSSION

Lichen planus is an idiopathic inflammatory disease that affects the skin, nails, hair, and mucous.

Membranes, which is mostly seen in middle-aged adults [1]. Some lichenoid drug eruptions occur at photo-exposed sites,

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Figure 1: Examination showed generalized erythrodermic eczematous and lichened eruptions

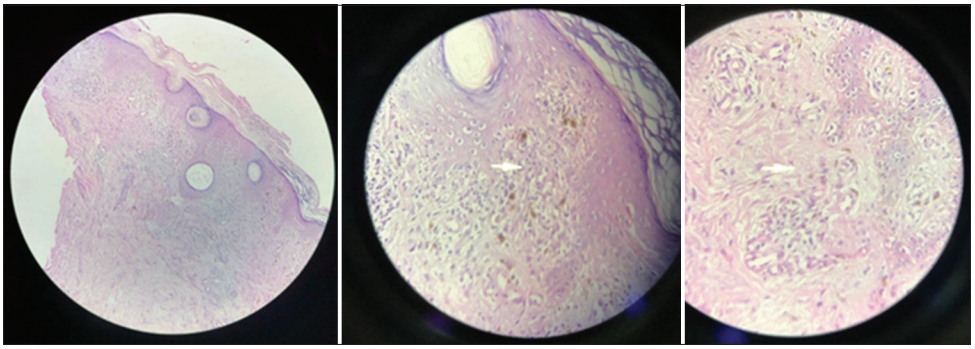

Figure 2: Histopathological examination showed hypergranulosis, liquefactive degeneration of basal cell layer, and band-like intense inflammatory lymphocytic cell infiltrate at the upper dermis with pigmentary incontinence

while others cannot be distinguished clinically and histologically from idiopathic lichen planus. Lichen planus-like lesions can be seen in chronic versus host disease, drugs and chemicals such as *para*-phenylenediamine, methacrylic acid esters, and dimethyl fumarate that were said to cause acute eczematous and subacute lichenoid eruption [3]. Tas *et al*. reported, in 2014, a toluene-induced lichen planus in two patients after inhalation of volatile perfume of toluene-containing compounds [4]. In the present case report, we presented a patient with generalized erythrodermic eczematous and lichenoid eruption after exposure to toluene-containing compound. We believed that this mode of presentation differed from the previous two cases that were described by Tas *et al*., where the lesions were acute exanthematous eruptive LP.

The histopathological features of the lesions were consistent with lichen planus, in addition to avoidance of further exposure to toluene-containing compounds and the response to treatment with systemic and topical steroids confirmed that these eczematous and lichenoid eruptions were induced by toluene. The exact mechanism by which toluene-induced eczematous and lichenoid eruptions are not well understood, but we suggested that toluene acts as an irritant chemical that may alter basal epidermal keratinocytes inducing autoimmune reaction toward these altered cells [1]. In addition, another explanation is that T-cell receptors on the T-cell could cross-react with these chemical antigens, which leads to the development of an immunological reaction that is manifested clinically as eczematous and lichenoid eruption [1].

Toluene diisocyanate is an irritant volatile aromatic hydrocarbon that is thought to induce skin sensitization through T helper2 in addition to direct skin irritation [5-7]. Chemicals that are well known to cause acute eczematous and subacute lichenoid eruption include *para*-phenylenediamine, methacrylic acid esters, and dimethyl fumarate [3]. Toluene was not mentioned in the literature as a cause of lichenoid eruption except the two cases described by Tas *et al*., so to the best of our knowledge, this is the third case of toluene-induced lichenoid skin lesions, although the skin lesions are a bit different from the previously reported cases.

CONCLUSION

Toluene-induced lichen planus may be presented with different clinical subtypes, so one should be familiar with them to avoid overlooking or misdiagnosing this condition.

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