Eosinophilic cellulitis (Wells’ syndrome) caused by a temporary henna tattoo

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Abstract
Eosinophilic cellulitis (Wells’ syndrome) is an uncommon condition of unknown etiology. Wells’ syndrome is usually seen in adulthood but very rare in childhood. Although pathogenesis of the disease is not very clear, it is a hypersensitivity reaction developing against a variety of exogenous and endogenous antigenic stimuli. Paraphenylenediamine is a strong allergen frequently used as a temporary henna tattoo, which makes the color darker. Here, a 9-year-old male patient with Wells’ syndrome is presented, which developed following a temporary henna tattoo and shown by the patch test sensitivity to paraphenylenediamine.

Key words: eosinophilic cellulitis, Wells’ syndrome, paraphenylenediamine, henna tattoo.

Introduction
In recent years, temporary henna tattoo has become popular among teenagers. Various substances are added to temporary henna tattoo dye to ensure the formation of black color and accelerate the absorption of dye by the skin. Paraphenylenediamine (PPD) is frequently used for this purpose and can cause a variety of allergic and hypersensitivity reactions, especially irritant contact dermatitis [1]. Wells’ syndrome is an uncommon inflammatory dermatosis of unknown etiology, with few cases reported worldwide. Wells’ syndrome is characterized by a pruritic rash, which usually follows a relapsing and remitting course, and distinct histology showing an infiltrate of eosinophils within the dermis. Seven clinical variants of Wells’ syndrome have been documented: plaque type, annular granuloma-like, urticaria-like, papulovesicular, bullous, papulonodular and fixed drug eruption-like [2–4]. Hypersensitivity response to a circulating antigen and an abnormal eosinophilic response to a number of causative agents are thought to be the cause [3, 5].

Here, a case of Wells’ syndrome developed following paraphenylenediamine application is reported.

Case report
A 9-year-old male patient suffered from redness and itching on the tattoo area 3 days after the application of a temporary tattoo. Systemic antihistamines and topical steroids were started and used for 10 days. The patient was admitted to our clinic because of lesions spread to the whole body. In his medical history, there was no atopic and chronic disease, prior to the eruption, there were no insect bites, or viral, bacterial and parasitic infection. Physical examination revealed erythematous, edematous, and papulonodular lesions on the left arm, the area of tattoo henna. Similar lesions were also seen on the trunk, spine and extremities (Figures 1 and 2). Examinations of other systems were normal. Laboratory examination was unremarkable, except mild eosinophilia (7% Eo, 600/mm3). Routine biochemical tests were within normal limits. Punch biopsy from tattoo area revealed superficial type hyperkeratosis irregular acanthosis in the epidermis; an inflammatory reaction accompanied by polymorphonuclear leukocyte, eosinophils and histiocytic infiltration in the dermis around the blood vessel walls, eccrine glands and hair follicles. In one area of the dermis, flame figures and around these figures, histiocytic cells were seen (Figure 3).

The patient was diagnosed as Well’s syndrome with clinical and histopathological findings. Lesions resolved without sequelae within 10 days of short-term systemic corticosteroid therapy. A patch test was done with standard “ALK T.R.U.E” test series after clinical improvement after 6 weeks. Paraphenylenediamine and Black Rubber
Mix 3 + induration was developed at 48, 72 and 96 h (Figure 4).

**Discussion**

George Wells first described this syndrome in 1971 as a ‘recurrent granulomatous dermatitis with eosinophilia’.

In 1979, it was referred to as “eosinophilic cellulitis” by Wells and Smith [2–5]. Lesions mostly localized on the limbs or trunk, with a sudden onset of itching and burning sensation, local temperature increase is usually not present, and it is in the form of one or more erythematous plaques and does not respond to antimicrobial treatment. Pruritus can be intractable and unresponsive.
to anti-histamines. Affected individuals typically present with erythematous plaques over a 2- to 3-day period and plaques usually resolve without scarring over 2–8 weeks [6]. During this period, pale and atrophic skin lesions may be confused with symptoms of morphea disease [3–6]. In our case, papulonodular and papular lesions were seen on the back and limbs, apart from the tattoo region. Wells’ syndrome is rarely present with systemic involvement, but eosinophilia is common [7]. Peripheral eosinophilia was found in half of the cases as well as in our patient, but it is not required for diagnosis [6, 7].

The pathophysiology of the lesions in Wells’ syndrome remains unknown. It has been suggested that excess production of IL-5 occurs, which drives eosinophilic accumulation in a local Th2 immune response [8]. There was no etiologic reason in approximately half of the cases reported in the literature [5–8]. Arthropod, insect bites, drugs, myeloproliferative disorders, viral, bacterial infections are shown as triggering factors. Penicillins, lincomycin, tetracycline, minocycline, ampicillin, and parasitic infections are triggering factors as well. Eosinophilia was found in half of the cases as well as in our patient, but it is not required for diagnosis [6, 7].

In the literature, approximately 30 children with Wells’ syndrome have been reported [10]. However, no sensitivity of paraphenylenediamine was observed in any of the cases. Our patient is the first pediatric case of Wells’ syndrome which developed after the application of temporary henna tattoos, and sensitization to paraphenylenediamine is shown by the patch test. Recently, the use of temporary tattoos has become widespread in children and young people, but the society is uninformed about the potential consequences of temporary tattoos. It should be emphasized that it is not a harmless application.

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