

BRIEF REPORT

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CHRONIC RELAPSING URTICARIA CONFINED TO INJECTION SITES OF UPPER ARMS

Abstract: New ongoing urticarial lesions confined to former injection sites of vaccination and allergy immunotherapy were observed in an 8-year-old boy. This finding can be best explained as an isotopic response phenomenon.

An isotopic response is characterized by the occurrence of a new skin disorder at the site of another, unrelated and already healed skin lesion (1).

CASE REPORT

An 8-year-old Caucasian boy with asthma, hayfever, and atopic eczema complained of ongoing localized wheal formation for more than a year. The hives, lasting for 30 minutes to several hours, were found exclusively on the lateral region of both upper arms where injections had been given intramuscularly and subcutaneously in the past (Fig. 1). The first wheals were encountered 3 months after the second year of preseasonal immunotherapy against pollen from hazelnut, birch, and alder (four injections at 2-wk intervals). The boy did not receive injections at other sites of the body.

Laboratory analyses for blood differential showed monocytosis and eosinophilia. Serum chemistry revealed normal results. Skin prick testing was positive for grass pollen and tree pollen. Radioallergosorbent test in serum detected high immunoglobulin (Ig)E concentrations for pollens of birch, alder, and hazelnut. Lung examination showed slightly high exhaled nitric oxide. Clinical signs of infection or intolerance to food were absent. The parents did not agree to perform a lesional biopsy. Treatment of wheals consisted of systemic antihistamines and topical antipruritic agents. No further injections have been given since beginning of wheal formation.

DISCUSSION

An *isotopic* response is characterized by the occurrence of a new skin disorder exactly at the site of another unre-



Figure 1. Urticaria at a former injection site on the lateral upper arm.

lated and already healed skin lesion (1–3). This is in contrast to an *isomorphic* response (Köbner phenomenon), which refers to the appearance of new lesions of a preexisting disorder along the site of injury (4).

According to Wolf et al (1) and Ruocco et al (5), the main clinical events that may damage and immunologically mark a skin region, which later on shows an isotopic response, include atypical and exaggerated immune reaction to viral antigens (e.g., herpes simplex, varicella zoster) or to immune complex deposits or altered tissue antigens (e.g., after exposure to radiograph, ultraviolet radiation, thermal injury). Furthermore, a bidirectional interaction between the nervous system and the immune system may affect the secretion of neuropeptides from cutaneous nerve fibers. A disturbance in blood microcirculation and chronic lymphedema may also contribute to this phenomenon. All these aspects may influence the number and function of T lymphocytes, monocytes, mast cells, and endothelial cells in lesional skin (1,5).

Skin disorders arising in sites of injections include tumors (e.g., basal cell carcinoma, squamous cell carcinoma, dermatofibrosarcoma protuberans, melanoma) and nontumors (e.g., granuloma annulare, lichen planus, lichen sclerosus et atrophicus, discoid lupus erythematosus) (1–3,5).

Although Lee et al (3) mention a localized chronic urticaria at the site of a healed herpes zoster lesion, to the best of our knowledge, chronic episodes of urticaria confined to regions of injections have not been previously reported.

In summary, we think that a cutaneous lesion after vaccination or immunotherapy may affect the immunologic, neural, and vascular system in a certain area, making this area prone to the development of new skin lesions.

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REFERENCES

1. Wolf R, Brenner S, Ruocco V et al. Isotopic response. *Int J Dermatol* 1995;34:341–348.
2. Möhrenschrager M, Engst R, Hein R et al. Primary manifestation of a zosteriform lichen planus: isotopic response following herpes zoster sine herpete? *Br J Dermatol* 2008; 158:1145–1146.
3. Lee H-J, Ahn W-K, Chae K-S et al. Localized chronic urticaria at the site of healed herpes zoster. *Acta Derm Venereol (Stockh)* 1999;79:168.
4. Christophers E, Mrowietz U. Psoriasis. In: Burgdorf WHC, Plewig G, Wolff HH et al., eds. *Braun-Falco's dermatology*, 3rd ed. Heidelberg: Springer, 2009:506–526.
5. Ruocco V, Brunetti G, Puca RV et al. The immunocompromised district: a unifying concept for lymphoedematous, herpes-infected and otherwise damaged sites. *J Eur Acad Dermatol Venereol* 2009;23:1364–1373.

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