

A case of persistent psoriasis occurring after influenza vaccination

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Sir,

A thirty-year-old male received influenza vaccination in the upper arm. Several days later, erythema appeared on the vaccinated site and spread to the trunk and extremities. He had no family history of psoriasis. He was treated with a topical corticosteroid for three months, which yielded no effects and, thus, he was referred to our hospital. A physical examination revealed numerous erythematous, scaly macules scattered on the trunk and upper extremities and erythema with thick scales scattered on the lower extremities (Figs. 1a and 1b). The psoriasis area and severity index (PASI) score was 9.7. We performed a skin biopsy from the left lower leg. Histopathology revealed a regularly elongated epidermis, an absent granular cell layer of the epidermis, parakeratosis in the corneal layer, and subcorneal neutrophil infiltration (Fig. 1c). Immunohistochemistry revealed that CD4- and CD8-positive T-cells infiltrated into the epidermis and upper dermis, and IL-17, CD123, and TNF- α were also detected in the inflammatory cells below the epidermis. He was diagnosed with psoriasis and was started on a treatment with topical betamethasone and calcipotriol formula (Dovobet) ointment and oral cyclosporine (300 mg/day). An improvement in the skin lesions other than those in the lower extremities was observed after two months. However, the scaly, erythematous lesions on the lower legs were resistant to therapy. The treatment was continued thereafter.

The present case developed psoriasis *de novo* on the trunk and extremities following influenza vaccination in the arm. The psoriasis was not transient and the patient developed a chronic course. Thus, we considered that true psoriasis was induced by the vaccination. To date,

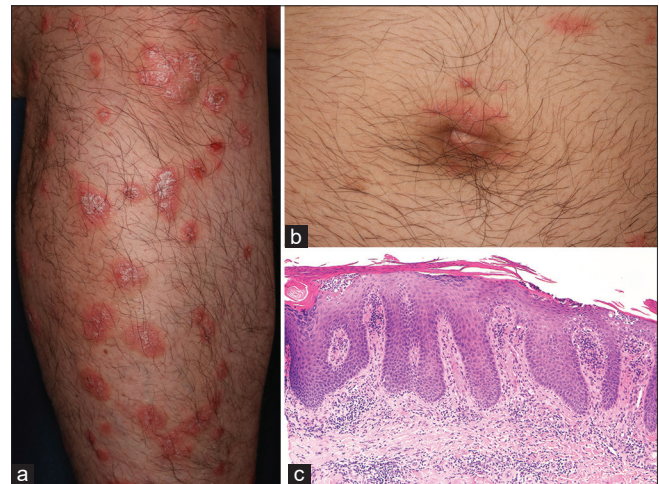


Figure 1: (a) Physical examination revealing diffuse erythema with thick scales on the left leg. (b) Erythema also present in the umbilical region. (c): Histopathology showing uniform epidermal hyperplasia, an absent granular cell layer of the epidermis, as well as parakeratosis and neutrophils in the stratum corneum and epidermis (H&E; 100 \times).

there have been several cases of the *de novo* onset of psoriasis or psoriasiform eruption or a worsening of pre-existing psoriasis after influenza vaccination. As far as we were able to search, there are sixteen reported cases of psoriasis occurring after influenza vaccination [1-4], including seven with a detailed description of the course and treatment [1-3]. Five of the seven cases improved with topical corticosteroids only (Table 1). The remaining two cases were resistant to topical corticosteroids, one of which was treated with phototherapy and the other was treated with topical corticosteroids and methotrexate (Table 2). In all seven cases, a complete clearance of psoriasis was observed. By contrast, in our case, the scaly, erythematous lesions on the lower extremities were resistant even to cyclosporine therapy, suggesting a rare case of persistent (not transient) influenza-vaccine-induced psoriasis.

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Table 1: Demographic and clinical features of the five cases treated with topical steroids only.

| Patient No. | Sex | Age | Time from vaccination to psoriasis flare onset (days) | Treatment for psoriasis flare | Outcome | Ref. |
|-------------|-----|-----|---|-------------------------------|--------------------|------|
| 1 | M | 37 | 7 | Topical steroids | Complete clearance | 1 |
| 2 | M | 47 | 28 | Topical steroids | Complete clearance | 3 |
| 3 | M | 45 | < 30 | Topical steroids | Complete clearance | 3 |
| 4 | F | 34 | 8 | Topical steroids | Complete clearance | 3 |
| 5 | F | 9 | 7 | Topical steroids | Complete clearance | 3 |

Table 2: Demographic and clinical features of the two cases resistant to topical steroids.

| Patient No. | Sex | Age | Time from vaccination to psoriasis flare onset (days) | Treatment for psoriasis flare | Outcome | Ref. |
|-------------|-----|-----|---|--|--------------------|------|
| 1 | F | 26 | 21 | Topical steroids and phototherapy | Complete clearance | 2 |
| 2 | M | 74 | 6 | Topical steroids initially, switched to methotrexate | Complete clearance | 3 |

Vaccination induces acquired immunity by antigen presentation. Naive T cells stimulated by the vaccine differentiate into effector T cells such as Th1 and Th17 cells. Vaccination also induces innate immunity. Plasmacytoid dendritic cells (pDCs) detect antigens from the vaccine with toll-like receptors and produce interferon- α , which has antiviral effects. These two types of immunity are involved in the course of psoriasis [5]. pDCs are induced by irritation, infection, environmental factors, among others. Interferon- α produced by pDCs induces inflammatory dendritic cells, which in turn induce Th1 and Th17 cells. These factors lead to the development of psoriasis. Influenza vaccination induces the activation of pDCs, Th1 cells, and Th17 cells, which may lead to the development of psoriasis.

Consent

The examination of the patient was conducted according to the principles of the Declaration of Helsinki.

The authors certify that they have obtained all appropriate patient consent forms, in which the patients gave their consent for images

and other clinical information to be included in the journal. The patients understand that their names and initials will not be published and due effort will be made to conceal their identity, but that anonymity cannot be guaranteed.

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