Anti-Programmed Cell Death-1-Induced Plaque and Guttate Psoriasis

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Sir,
Programmed cell death (PD)-1 is an immune checkpoint receptor expressed on antigen-stimulated T-cells. Anti-PD-1 antibodies have demonstrated a remarkable benefit for unresectable melanoma and advanced non-small cell lung cancer (NSCLC). To date, cases of the induction of psoriasis/psoriasiform eruptions or exacerbation of preexisting psoriasis have been reported anti-PD-1 antibodies. We report a patient with NSCLC, who developed plaque-type psoriasis involving the trunk and dorsum of the hands, as well as guttate-type psoriasis on the soles, during nivolumab (anti-PD-1 antibody) therapy.

A 76-year-old man had been treated with nivolumab (3 mg/kg) for NSCLC every 3 weeks at Shirakawa Kosei General Hospital. After the second infusion, slight itchy eruptions appeared on the lower extremities, which were further worsened after the third infusion and thus he was referred to the dermatology clinic. Skin examination disclosed psoriatic plaques scattered over the trunk and extremities with a PASI score of 4.1. Psoriasiform plaques were scattered on the dorsum of hands [Figure 1a], whereas small, scaly erythemas were observed on the soles [Figure 1b]. He denied either sore throat or upper respiratory tract infection. Laboratory examinations showed normal eosinophil ratio (0.8%) in the peripheral blood, mild increased level of C-reactive protein (1.7 mg/dl), and normal liver and renal functions. A skin biopsy from the dorsum of the hand revealed mild parakeratotic hyperkeratosis, regular acanthosis, mild telangiectasia in the papillary...
region. Recent findings have shown that systemic, tissue, and cellular levels of interleukin-17 are increased in vitiligo. These observations suggest that the psoriasis in our patient might have been exacerbated by the upregulated Th1/Th17 cell activities provoked by nivolumab.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understood that his name and initial would not be published and due efforts would be given to conceal his identity, but anonymity could not be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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Inhibition of the PD-1 pathway has been suggested to result in overactivation of T-cell function including augmentation of Th1 and Th17 cell activities, which may induce psoriasis. A study using imiquimod-induced murine psoriasis model, either PD-1 genetic deficiency or PD-1 blockade by monoclonal antibody, exacerbated psoriasiform dermatitis. Furthermore, an interesting report showed vitiligo development after improvement of psoriasis by nivolumab therapy in the same

Figure 1: Psoriatic plaques were scattered on the dorsum of the hand (a) and guttate psoriasis lesions were scattered on the sole (b). Histological features of the hand showed mild parakeratotic hyperkeratosis and moderate, regular acanthosis with telangiectasia in the papillary dermis (c) and another specimen from the sole revealed thickened cornified layer with parakeratosis, and mild epidermal elongation (d). Immunostain showed a number of CD4-positive T-cells in the upper dermis (e) and CD8-positive T-cells in the epidermis and upper dermis (f) (H and E, ×200)