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SHORT COMMUNICATION

Coexistent Skin Lesions of Vitiligo and Psoriasis Vulgaris. Immunohistochemical Analyses for IL-17A-producing Cells and Regulatory T Cells

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Vitiligo vulgaris (VV) and psoriasis vulgaris (PV) are common dermatoses, with a worldwide occurrence of 0.5–1% and 1–3%, respectively. An imbalance between effector T cells and regulatory T cells (Tregs) can result in the pathogenesis of cutaneous immune diseases. In VV, interleukin (IL)-17-producing T-helper (Th) 17 cells are increased in the lesional skin as seen in PV (1). However, the number of Tregs is drastically reduced in the lesional skin of VV, which may allow an activation of effector T cells (2). In PV, an increased number of lesional Tregs was indicated (3, 4). While both lesional Th17 cells and Tregs are increased in PV, the ratio of Th17 cells to Tregs was shown to be inversely correlated with the psoriasis area and severity index (PASI). It has recently been proposed that Tregs readily turn into Th17 cells in PV, which potentially perpetuates the inflammatory process that characterises the disease (5). Herein, we present a case with the coexistent skin lesions of VV and PV with immunohistochemical analyses.

CASE REPORT

A 66-year-old woman with generalised VV since childhood presented with scaling erythematous plaques, which arose strictly confined to pre-existing vitiligo lesions several months ago (Fig. 1a). Laboratory examination revealed no abnormalities. The patient was otherwise healthy and had no family history of note. A biopsy was performed that included the normal (N in Fig. 1b), vitiligo (V in Fig. 1b), and erythematous (P in Fig. 1b) skin lesions after informed consent was obtained. Typical psoriatic histological findings were observed in the erythematous plaque, including hyper- and parakeratosis, acanthosis with elongated rete ridges, and dense infiltration of lymphocytes (P in Fig. 1c). On this basis, we made a diagnosis of the coexistent skin lesions of VV and PV. Consistently, the immunohistochemistry of melan-A demonstrated that melanocytes were observed only in the normal skin (Fig. 1d). The psoriatic lesions were limited to the VV lesions of lower legs with a PASI of 1.4. After heat retrieval for 60 min using CC1 cell conditioning solution (Ventana Medical Systems, Cambridgeshire, UK), immunohistochemical staining of 2GV6 (anti-CD3) (Ventana Medical Systems) (Fig. 1e), 1F6 (anti-CD4) (Novo Castra, Newcastle-upon-Tyne, UK) (Fig. 1f), C8/144B (anti-CD8) (DAKO Cytomation, Glostrup, Denmark) (Fig. 1g), PCH101 (anti-Foxp3) (eBioscience, San Diego, CA) (Fig. 1h), and H-132 (anti-IL-17A) (Santa Cruz Biotechnology Inc, Santa Cruz, CA) (Fig. 1i) were performed, and the number of positive cells was counted in the normal, vitiligo, and psoriatic skin lesions (Table SI[1]). Inflammatory cell infiltrations were most evident in psoriasis, were less observed in vitiligo, and were marginal in normal skin.

DISCUSSION

Our case exhibited 3 intriguing findings: firstly, to reflect the typical changes of VV and PV, the number of IL-17A-producing cells in the skin was increased in both vitiligo and psoriasis (mostly in the latter), in accordance with a dense infiltration of $CD4^+$ and $CD8^+$ cells, as reported previously (6). Secondly, the absolute number of Tregs was increased in vitiligo and psoriasis (Table SI[1]), and the ratio of Tregs to $CD3^+$ T cells was increased prominently in psoriasis ($28.7 \pm 4.5\%$), compared to that of normal skin ($15.2 \pm 1.4\%$) and vitiligo ($15.6 \pm 2.1\%$). The increase in infiltrative Tregs in our case might be related to the development of PV, which emerged inside VV. Thirdly, the ratio of IL-17A-positive cells/Tregs was as low as 0.22 in psoriatic lesions. A previous report indicated that this ratio inversely correlated with PASI (3), which was inconsistent with our case. Together with the previous finding that Tregs turn into Th17 cells and the acute onset of PV in our case, the prominent Treg accumulation and low Th17 cells/Tregs ratio might have reflected the acute phase of psoriatic inflammation. It is also possible that the discordance of PASI and the Th17 cells/Tregs ratio with the previous report may be caused by modulated lesional inflammatory cytokine levels such as tumour necrosis factor (TNF)-α and IL-6, which are elevated in both VV and PV (7). In fact, increased TNF-α expression in the lesional site of coexisting PV and VV was indicated (6). While IL-6, together with transforming growth factor-β, is known to induce differentiation of IL-17A-producing cells and TNF-α acts to amplify their numbers (8), TNF-α is also known to acquire the potential to activate Tregs under certain conditions (9). Although there still remains the possibility that these cytokine balances in coexisting lesions may differ from those in conventional PV or VV, we expect that the direct comparison of histology and immunohistochemical findings among normal, vitiligo, and psoriatic skin lesions in one continuous section will shed some light on their pathogenesis.

The authors declare no conflicts of interest.

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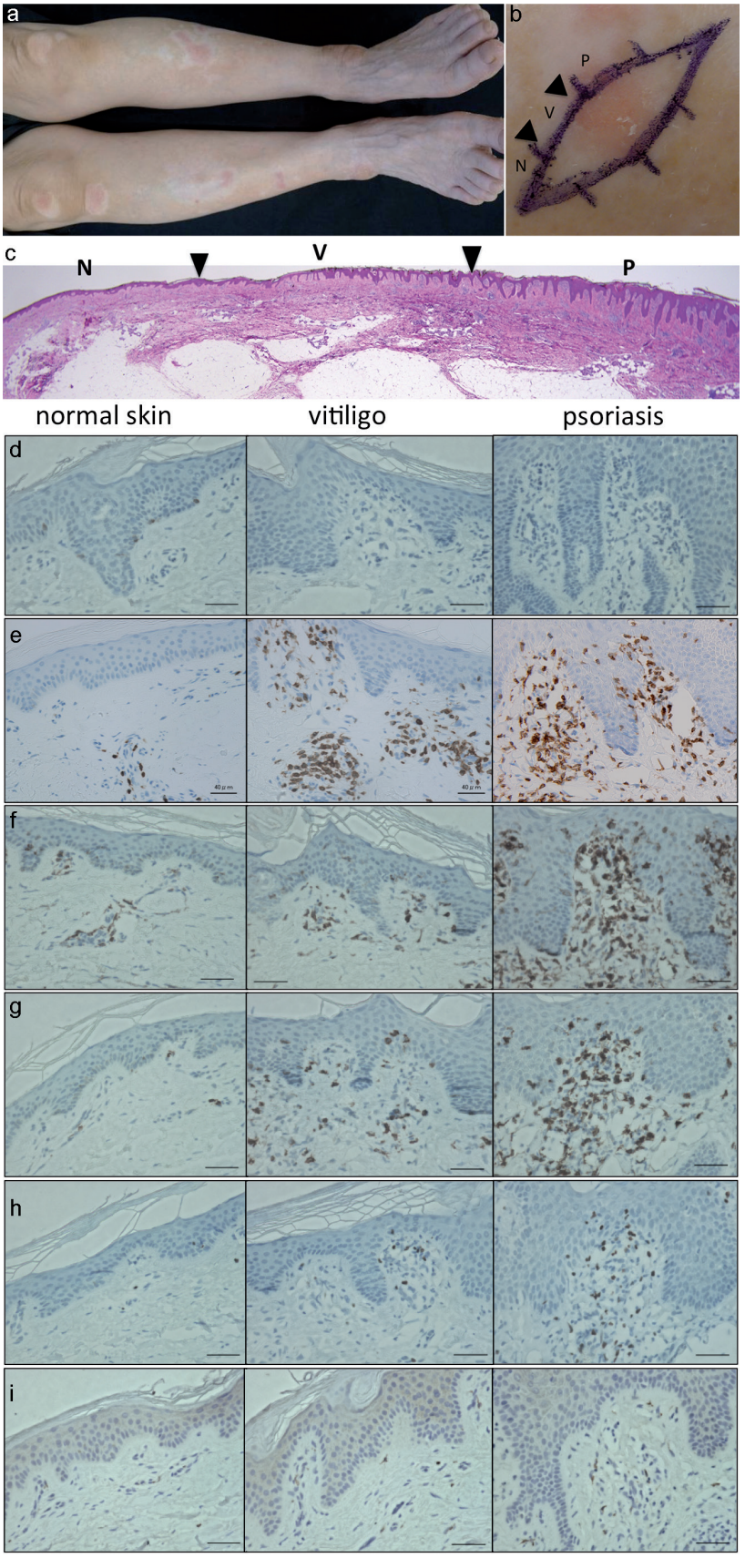

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Fig. 1. Clinical and histological manifestations. (a) Clinical image. The psoriatic erythematous plaque is strictly confined to the vitiligo lesion. (b) Histology. Biopsy was performed to include the normal (N), vitiligo (V), and psoriatic (P) skin lesions. (c) Haematoxylin & eosin staining. Bar, 20 μm. (d–i) Staining of melan-A (d), CD3 (e), CD4 (f), CD8 (g), Foxp3 (h), and IL-17A (i). Bar, 40 μm.