Interferon-Gamma Release Assay in a Patient with Tuberculosis Verrucosa Cutis

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Dear Editor:

A 62-year-old man presented with an annular plaque that had been present for 35 years on his left inner thigh. Physical examination revealed a 7×8 cm annular erythematous plaque with central clearing and hyperpigmentation (Fig. 1). We suspected tinea cruris, granuloma annulare, and erythema annulare centrifugum, and performed a 4-mm punch biopsy. The pathologic examination of the specimen revealed parakeratosis, acanthosis in the epidermis, and naked granulomas in the upper to mid-dermis (Fig. 2). We also performed posteroanterior chest radiography, potassium hydroxide smear, acid-fast bacilli (AFB) stain, mycobacterial culture, periodic acid-Schiff stain, and tuberculosis polymerase chain reaction (TB-PCR), which were all negative. The tuberculin skin test (TST) showed a positive result; however, because the patient was a Korean with a history of tuberculosis vaccination, the specificity of the test was low. Therefore, we performed interferon-gamma release assay (IGRA), and the positive result of this test made us suspect a tuberculosis source of the granulomas. Considering the long duration and verrucous morphology of the lesion, as well as the histopathological and IGRA results, the diagnosis was concluded to be tuberculosis verrucosa cutis (TVC) and the patient was treated with multidrug antituberculosis medications for 6 months. A differential diagnosis with hypertrophic lupus

vulgaris was difficult because both diseases are a form of paucibacillary cutaneous tuberculosis that could have similar clinical manifestations (verrucous plaque with central clearing) and a similar histopathology. The firm, rather than soft, consistency and the localization on the lower extremity favored the diagnosis of TVC. After the treatment, the clinical lesion disappeared, leaving slight post-inflammatory hyperpigmentation and testing negative on IGRA.

TVC is a rare cutaneous tuberculosis. It results from external inoculation of mycobacteria into the skin of a previously infected person who has a moderate to high degree of immunity. Lesions progress slowly and persist for many years if left untreated¹. The diagnosis of TVC traditionally requires clinicopathologic correlation with a positive TST or the detection of *Mycobacterium tuberculosis* DNA through PCR².

Fig. 1. A 7×8 cm annular erythematous plaque with central clearing and hyperpigmentation in the left inner thigh.

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Fig. 2. (A) Parakeratosis, acanthosis in epidermis and naked granulomas in the upper to mid-dermis (H&E, $\times 40$). (B) Naked granulomas composed of epithelioid cells (H&E, $\times 200$).

IGRA is a relatively new laboratory test; it measures the production of interferon-gamma by T cells exposed to certain antigens, including early secretory antigen target-6 and culture filtrate protein-10, which are specific for *M. tuberculosis*. Unlike TST, it is not affected by previous bacille Calmette-Guerin (BCG) vaccination or exposure to nontuberculous mycobacterium³. It is an improved diagnostic test for detecting tuberculosis infection, particularly in countries like Korea where BCG vaccinations have been widely used.

Koh et al.⁴ reported the usefulness of IGRA in finding evidence of tuberculosis in tuberculid patients. We emphasize that IGRA can also be a good diagnostic aid in detecting evidence of tuberculosis in TVC.

We experienced a case of TVC in the left inguinal area, in a Korean patient with a history of BCG vaccination. The patient had a normal chest radiograph, no mycobacterial growth in culture, a negative AFB stain, and a negative TB-PCR. However, IGRA and the purified protein derivative test were positive, which led us to conclude a di-

agnosis of TVC. We report the application and effectiveness of IGRA for the confirmation of TVC in countries where tuberculosis is prevalent.

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