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Case Report

Tinea corporis caused by *microsporum canis* in children with HIV

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Abstract Tinea corporis is a glabrous skin fungal infection mainly affecting children and immunosuppressed patients. The clinical feature of tinea in HIV patients shows mild inflammation that resembles other dermatoses. This report aims to establish the diagnosis and therapy choices promptly. A 15-year-old boy with HIV and pulmonary TB came with complaints of itchy small red papules, exacerbated by sweating. These lesions extend almost all over the body. Dermatological examination of the chest, abdomen, back, arms and hands, and both legs showed multiple erythematous papules with annular configuration and the elevated border with scales over the erythematous base. KOH examination revealed the culture's long septate hyphae and colonies of the fungus *Microsporum canis*. Tinea corporis was diagnosed, and the patient was treated with oral griseofulvin and topical ketoconazole. *Microsporum canis* is the third most common causative organism and is associated with 14% of cases of tinea corporis. These annular lesions resemble centrifugal erythema annular and generalized annular granulomas. A fungal culture examination was performed to confirm the diagnosis, and the tinea species were identified. Terbinafine, itraconazole, fluconazole and griseovulfin are the treatment options for tinea corporis with HIV. Definitive diagnosis and exact identification of the causative organism of tinea corporis could be determined by culture. Griseofulvin is still used to treat tinea, especially in liver function problems.

Key words
Tinea, HIV, griseofulvin, Microsporum canis, annular.

Introduction

Tinea corporis is a fungal infection that mainly affects children and immunosuppressed patients.[1,2] The prevalence of tinea corporis in several studies has been reported as 20-70% of all dermatophytosis in HIV patients.[3,4] Immunosuppressed patients tend to have mild inflammation when exposed to infection, and this is called anergic. These lesions can mimic dermatoses of other etiologies so that diagnosis can be delayed and lead to the development of fungal infections.[4] We report a case of tinea corporis caused by *Microsporum canis* in an immunocompromised 15-year-old boy. This report aims to establish the diagnosis and therapy choices promptly.

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Case report

A 15-year-old boy came to the Dermatology and Venereology outpatient clinic, Dr. Sardjito, with complaints of red patches on the body three months prior to consultation. Initially in the form of small red papules on both arms, itchy, especially when sweating and hot air. The red papules widen and extend to the chest, abdomen, back, and legs. He was diagnosed with HIV and received antiretroviral virus (ARV) therapy with tenofovir, lamivudine, and efavirenz regimens.

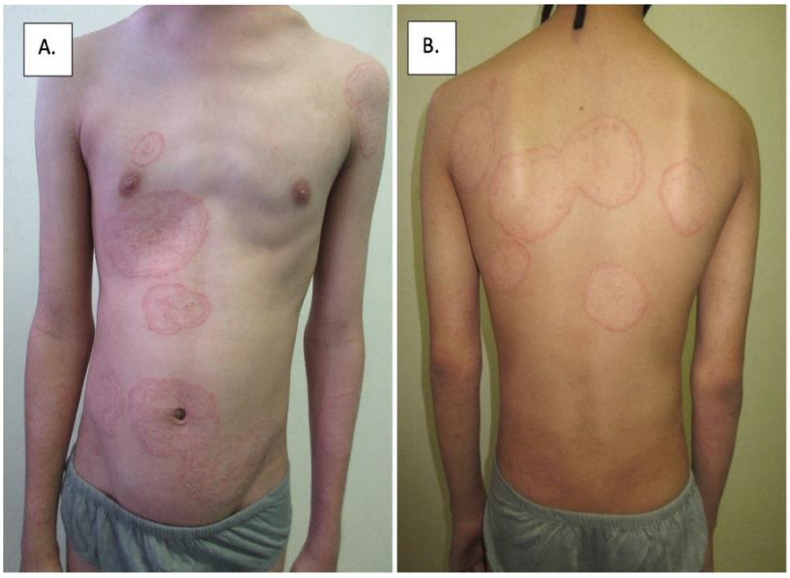

Figure 1 Polycyclic erythematous papules with central clearing.

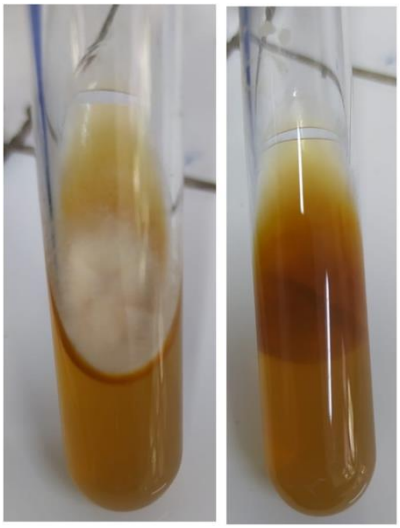

Figure 2 Microsporum canis colonies like velvet, yellowish-white, with the central part rising and piled up, surrounded by concentric white folds.

He was also diagnosed with pulmonary tuberculosis (pulmonary TB) with marasmus-type malnutrition and received anti-tuberculosis drug therapy (OAT) with a separate regimen (isoniazid, pyrazinamide, rifampicin, ethambutol). He claimed to maintain good hygiene, bathe twice a day and always change clothes. He has a pet cat that had fur loss prior to his lesions. Family history with similar complaints was denied.

Physical examination revealed normal vital signs, weight 30 kg, height 152 cm, weight/TB 69%, upper arm circumference 15 cm. The patient seems malnourished. The left cervical lymph nodes are enlarged. Over the dermatovenereology status on the chest, abdomen, back, arms and hands, and legs, there were annular erythematous papules that formed "central clearing" with thin scales on top and an erythematous base (**Figure 1**).

Direct examination of scrapings with 10% KOH was done. Long septate hyphae were found. Fungal culture from skin scraping specimens showed yellowish-white Velvet-like colonies with a central part rising and stacked, surrounded by concentric white folds (**Figure 2**). Microscopic appearances showed hyphae with spindle-shaped macroconidia with pointed ends (**Figure 3**). The result was identified as *Microsporum canis*.

Laboratory tests revealed hemoglobin 9.7 g/dL (13-18); hematocrit 30.1% (40-54). The liver function examination showed SGOT 105 U/L (<33); SGPT 104 U/L (<26). Urinalysis did not reveal any abnormalities. The chest X-ray is suitable for pulmonary TB, and the cast is normal. He was diagnosed as tinea corporis in HIV patients with marasmus type malnutrition and pulmonary tuberculosis.

The therapy given was griseofulvin 1x500 mg

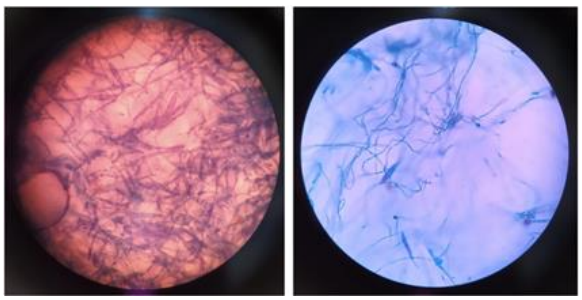

Figure 3 Microsporum canis hyphae depiction of spindle-shaped macroconidia with pointed ends.

for two weeks, ketoconazole cream two times a day on lesions on the body and extremities. Unfortunately, he does not return to control.

Discussion

Tinea corporis affects all ages.[1] It is the second most common tinea after tinea capitis. *Microsporum canis* is the third most common causative organism and is associated with 14% of cases of tinea corporis.[5] *Microsporum canis* infects through direct contact with arthrospores, some spread from animals (zoophilic organisms), as well as indirectly from fomites (combs, brushes, hats, upholstery, furniture, linens), direct inoculation through damage to the skin is more common in people with decreased cell-mediated immunity.[6,7] Our patient risk factors included daily contact with his pet cat, and previously diagnosed HIV caused the patient to be more prone to *M. canis* infection.

Direct microscopic examination is the most effective and efficient investigation in diagnosing dermatophyte infections. The diagnosis is usually made by examining 10% KOH from skin scrapings at the lesion's periphery.[8] In this case, 10% KOH examination from direct skin scrapings revealed long septated hyphae, confirming the diagnosis of fungal infection by dermatophytes. A fungal culture examination confirms the diagnosis and identifies the causative species. The macroscopic view shows the colonies like velvet, yellowish-white in color, with the central part elevated and stacked, surrounded by concentric white folds. The microscopic picture shows hyphae with spindle-shaped macroconidia with pointed ends. They were confirming the Microsporum canis as a causative species.

In this case, there are multiple comorbidities, so drug interactions should be considered to decide the appropriate therapy. The patient is currently on ARVs (tenofovir, lamivudine, efavirenz). The patient also received OAT therapy with a regimen of INH, Pyrazinamide, Rifampicin, and Ethambutol. The best therapy for dermatophytosis in HIV patients is systemic antifungal drugs, such as terbinafine, itraconazole, or fluconazole. Griseofulvin is still used to treat tinea in children in America. The treatment regimen mentioned has no interaction with ARVs or OATs so all options can be given. The results of laboratory examinations of the patient's liver function had increased (SGOT 105 U/L; SGPT 104 U/L), so the azole group could not be given in this case. The action of the azole class of drugs as CYP3A4 inhibitors (a member of the cytochrome P450 enzyme) will inhibit drug metabolism through the liver, causing its levels to last longer in the blood and potentially causing toxicity.[9] In this case, the patient was given griseofulvin as systemic therapy and ketoconazole cream. The azole group that significantly increases liver function enzymes is fluconazole, while ketoconazole, itraconazole, and voriconazole are less significant.[9] Khoza and colleagues reported that ketoconazole had the highest risk of causing liver injury, followed by itraconazole, fluconazole, terbinafine, and griseofulvin.[10]

Conclusion

A definitive diagnosis and definite identification of the causative organism of tinea corporis can be made by culture. Griseofulvin is still used to treat tinea, especially in liver function problems.

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