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Tinea Corporis in a Gardener Caused by *Microsporum gypseum*

Pratibha Dave[1] and **Mahendra Pal**[2*]

[1]*Welfare Hospital and Research Centre, Gujarat, India*
[2]*Narayan Consultancy on Veterinary Public Health and Microbiology, Anand, India*

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***Corresponding author:**
Mahendra Pal
Narayan Consultancy on Veterinary Public Health and Microbiology
4 Aangan, Jagnath Ganesh Dairy Road, Anand India
Email: palmahendra2@gmail.com

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Abstract

Dermatophytosis (tinea) is an important cosmopolitan mycotic disease, which occurs in sporadic as well as in epidemic form. The present paper describes the causative role of *Microsporum gypseum,* a soil borne fungus, in the etiology of tinea corporis of a 39-year-old healthy gardener who had no underlying disease. The patient was occupationally exposed to the soil. Diagnosis was established by employing standard mycological techniques that include direct microscopy and cultural isolation. Topical therapy with terbinafine cream (1%) was effective, and no side effects were observed in the patient. Emphasis is given on early diagnosis and prompt treatment in order to prevent the spread of infection. Narayan stain being cheap than other commercially available stains is recommended to undertake detailed morphological studies of fungi, which are implicated in various clinical disorders of humans and animals. To the best of our knowledge, this seems to be the first record of tinea corporis due to *Microsporum gypseum* in an immunocompetent gardener from Gujarat and probably from India.

Keywords: Geophilic dermatophyte, *Microsporum gypseum*, Narayan stain, Terbinafine cream, Tinea corporis.

Introduction

Skin diseases are frequently diagnosed in human and animal health clinics globally. Tinea also known as dermatophytosis or ringwom is a highly infectious mycotic disease, which has worldwide distribution (Weitzman and Summerbell 1995; Pal, 2007; Ramaraj *et al.,* 2016; Pal and Patel, 2018). It is caused by dermatophytes, which comprised of three genera, namely *Trichophyton*, *Microsporum* and *Epidermophyton* (Dave *et al.*, 2014). Dermatophytes are the filamentous fungi, which invade and multiply within the keratinized tissues of the body namely, the skin, hair, and nail (Pal, 2007; Pal and Patel, 2018). A plethora of factors, such as age, sex, occupation, personal hygiene, standard of living, nutrition, animal husbandry practices, and environmental conditions predispose the individual to the infection with dermatophytes (Pal, 2007). It is estimated that about 20% to 25 % of the world population is affected with dermatophytosis (Pal and Patel, 2018). Dermatophytosis is reported from many countries of the world including India (Weitzman and Summerbell 1995; Peerapur *et al.* 2004; Pal, 2007; Dave *et al.,* 2014). It is stated that the humid and hot climatic conditions of India makes dermatophytosis a very common superficial fungal infection of the skin (Niranjan *et al.* 2012).

The Tinea Corporis, also called ringworm of the body often affects the children and adults who live in the humid and hot climate. It is a superficial fungal infection mainly of glabrous skin caused by *Epidermophyton floccosum, Microsporum canis, M.gypseum,*

Trichophyton mentagrophytes, T.rubrum, and T.tonsurans (Dave *et al.,* 2014; Ramaraj *et al*., 2016). Among these dermatophytes, *T.rubrum* is most commonly implicated in the etiology of tinea corporis. In this context, Romano and co-workers (2009) mentioned that ringworm due *M. gypseum* is responsible for 0.7% to 5% of all dermatophytosis. The contact with soil is considered as the source of *M. gypseum* infection. The paucity of information on tinea corporis due to *Microsporum gypseum* prompted the authors to delineate the causative role of *Microsorum gypseum* in tinea corporis of a 39- year- old male immunocompetent patient from Bharauch, Gujarat, India.

Materials and Methods

The patient who was a 39-year-old gardener with dermatological disorder visited the skin Outpatient Department (OPD) of Welfare Hospital, Bharauch, India. The gardener had one small ring shaped, raised, erythematous lesion with distinct margin on the lower part of right side of abdomen. Based on the clinical symptoms, the patient was diagnosed as tinea corporis. The parent was asked to get laboratory investigations to rule out tuberculosis, diabetes, and HIV. The lesion when exposed under Wood's lamp showed dull yellow fluorescence. The skin scrapings were collected aseptically from the periphery of the lesion by sterilized scalpel in a disposable plastic Peti dish. A small part of the skin scrapings was treated with a 10% solution of potassium hydroxide (KOH) and Parker blue-black ink (INK) (Pal,2007), mounted on a clean glass slide, and examined microscopically for the presence of fungal elements under low and high power of magnification. The remaining specimen was inoculated onto nutrient agar, and Sabouraud dextrose agar with chloramphenicol (0.05 mg/ml) and actidione (0.5 mg/ml), and also on dermatophyte test medium (DTM) (Pal, 2007). Both the media were incubated at 25°C, and monitored daily for the fungal growth. The colonies were examined grossly for the texture and pigmentation etc. The confirmation of the isolate was done by microscopic examination of fungal growth in "Narayan" stain, which contained 0.5 ml of methylene blue (3% aqueous solution), 4.0 ml of glycerin, and 6.0 ml of dimethyl sulfoxide (Pal,2004). The patient was advised to apply terbinafine cream (1%) on the lesion two times daily for about 21 days. Furthermore, the patient was asked to observe any side effect after the application of topical antifungal drug on the lesion.

Results

The diagnosis was confirmed by detection of thin branched, hyaline fungal hyphae in the skin scrapings in potassium hydroxide-Parker blue-black ink solution under light microscope, and also by the isolation of *M. gypseum* in pure growth on Sabouraud dextrose agar with chloramphenicol and actidione and also on dermatophye test medium (DTM). On Sabouraud medium, *M. gypseum* grew rapidly, colony was flat with irregular fringed border, powdery to granular with rosy pink on obverse and yellow to brownish on reverse. The detailed microscopic examination of the isolate in Narayan stain revealed abundant ellipsoidal shaped, thin walled macroconidia, and very few small, club shaped microconidia, which morphologically resembled to *M. gypseum* (Pal, 2007). There was no growth of bacteria on nutrient agar.

The treatment was done with terbinafine ointment (1%), which was applied on the solitary lesion on the abdomen two times daily for about 3 weeks. The medication was applied at least 3 cm beyond the margin of the lesion. The patient was advised to continue therapy for at least 7 days after the lesion is cleared. The topical application of drug showed good clinical response. The patient did not complain any side effect, such as redness, swelling, and pruritus. As the patient did not visit the Skin Clinic after clinical cure, we, therefore, could not assess the effectiveness of antifungal drug. It is pertinent to confirm the mycological cure after the therapy to evaluate the efficacy of the drug.

Discussion

Dermatophytosis is a widely prevalent fungal disease of public health significance Disease is commonly encountered in tropical countries, and may cause epidemic in areas with higher humidity, over-population, and poor hygienic living conditions (Weitzman and Summerbell 1995; Peerapur *et al*. 2004). Humans can acquire the infection due to direct contact with a diseased person or animal. Infection can also be contacted by indirect contact with fungal contaminated objects (Pal, 2007; Dave *et al*., 2014). The clinical symptoms, direct demonstration and isolation of dermatophyte from the skin specimen, and response to antifungal drug clearly indicated that our patient was suffering from tinea corporis due to *M. gypseum*. As *M. gypseum* is a geophilic dermatophyte, our patient being a gardener was continuously exposed to the soil, and probably acquired the infection from the immediate environment. However, no epidemiological investigation was carried out to establish the source of infection.

In India, many cases of tinea corporis are caused by *T. rubrum* (Ramaray *et al*., 2016). However, we isolated *M. gypseum* from a 39-year-old male gardener who had tinea coropris. Our patient was immunocompetent as laboratory investigations failed to indicate any evidence of diabetes, tuberculosis, and HIV. However, Bhagra and co-workers (2013) reported tinea corporis due to *M. gypseum* in a patient with acquired immunodeficiency syndrome.

Interestingly, our patient who had a small ringworm lesion on the abdomen, responded well with topical application of terbinafine cream. If the lesions are more extensive, oral therapy with terbinafine (250–500 mg/day for 2–6 weeks) or itraconazole (100–200 mg/day for 2–4 weeks) is advised. Earlier workers also mentioned that tinea corporis usually responds to the topical antifungal drugs like terbinafine cream (Choudhary *et al.,* 2013; Ely *et al*., 2014). It is, therefore, recommended that topical treatment with

terbinafine should be undertaken if the ringworm lesion is localized and not widespread. We, therefore, suggest that early diagnosis and chemotherapy is highly imperative to prevent the spread of the infection.

As far as could be ascertained this seems to be the first mycologically confirmed case of tinea corporis due to *Microsporum gypseum* in a immunocompetent gardener from the State of Gujarat, and probably India.

Conclusion

Dermatophytosis is a highly infectious fungal disease that represents the public health, especially in the tropical regions of the world. The patient was occupationally exposed to soil that serves as a source of infection. It is emphasized that potassium hydroxide, which is easy available, simple to prepare and very cheap can be widely used by poor resource countries to make a rapid presumptive diagnosis of ringworm at primary health centre where cultural facilities for isolation of dermatophytes are not easily available. Further, Narayan stain being very cheap than other stains can be routinely employed by public health and microbiology laboratories to study the detailed morphology of dermatophytes, which are implicated in the etiology of human and animal ringworm. As far as could be ascertained, this appears to be first record of mycologically confirmed case of tinea corporis due to *M. gyseum* in infection in an immunocompetent subject who was occupationally exposed to soil when working in the garden.

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Conflict of Interest: None

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