Journal of Endocrinology and Metabolism Research

ISSN: 2582-7960

Srivastava MK, et al., 2022-J Endo Metabol Res

Case Report

Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study

Manoj Kumar Srivastava[1] and Kumar Prafull Chandra[2*]

[1]Manasvi Diabetes Clinic, 16/1432, Indira Nagar, Lucknow, India

[2]Chandra Diabetes Clinic, Vijayant Khand, Gomtinagar, Lucknow, India

[*]**Corresponding Author:** Kumar Prafull Chandra, Chandra Diabetes Clinic, Vijayant Khand, Gomtinagar, Lucknow, India.

Receiving Date: 10-18-2022

Accepted Date: 10-31-2022

Published Date: 11-21-2022

Abstract

Introduction: Dermatophytes are the most common agents of superficial fungal infections worldwide, and especially widespread in the tropical and subtropical countries like India, where the environmental temperature and relative humidity are high. Corona virus disease-2019 (COVID-19) likely increases the risk for fungal infections because of its effect on the immune system and because the treatments for COVID-19 (like steroids and other drugs) can weaken the body's defenses against fungi. The present case discusses extensive Tinea infection in post COVID-19 patient living with Type-2 Diabetes Mellitus (T2DM).

Case presentation, diagnosis, and management: A 58-year-old male with history of T2DM for 27 years presented with progressively increasing skin lesions on his back, gluteal area and back of thigh over 2 months duration. Around 3 months back, he had developed RTPCR positive COVID-19 infection with involvement of lower respiratory tract with dip in peripheral oxygen saturation (SpO_2). During hospitalisation, he received deflazacort 30mg once daily along with symptomatic treatment as per contemporary guidelines. At the time of presentation, the lesions were maculopapular with pigmentation and scaling. There were no definite ring lesions with central clearing, which is usually seen in fungal superficial skin infections. Few pustular lesions were also present in genital area.

Nearly one month after discharge slightly elevated circular scaly lesions on his thighs with minimal itching developed which progressed involving back of thighs, gluteal areas, and the back. Diagnosed as Psoriasis, local steroid ointment along with Fexofenadine (antihistamine) was used. There was initial improvement in lesion and symptoms, however there was a flare up in lesion within 2 weeks and several satellite lesions appeared on all over back and gluteal region. Direct microscopic examination of scrapings from the skin lesion after treatment with 20% potassium hydroxide (KOH) was done. The scrapings were characterized by presence of refractile, long, smooth, undulating, branching, and septate hyphal filaments with or without

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.

DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

arthroconidiospores confirming the diagnosis of dermatophytosis. Patient was put on local luliconazole 3% cream as it has anti-inflammatory properties along with strong antifungal effect. Looking at the extensive nature of his lesion, he was also started on systemic antifungal Itraconazole 200mg per day for 8 weeks. His insulin doses were modified to achieve a better glycaemic control while avoiding hypoglycaemic events.

Conclusion: Tinea corporis is a common fungal infection and the differential diagnosis is broad and, at times, difficult due to the prior use of medications, such as calcineurin inhibitors or corticosteroids. Furthermore, diseases may present with bizarre morphology in immunocompromised patients. Physicians must be familiar with this condition so that an accurate diagnosis can be made, and appropriate treatment initiated.

Introduction

Dermatophytes are the most common agents of superficial fungal infections worldwide, and especially widespread in the tropical and subtropical countries like India, where the environmental temperature and relative humidity are high. Corona virus disease-2019 (COVID-19) likely increases the risk for fungal infections because of its effect on the immune system and because the treatments for COVID-19 (like steroids and other drugs) can weaken the body's defenses against fungi [1]. Hyperglycaemia in diabetes is thought to cause dysfunction of the immune response, which fails to control the spread of invading pathogens in diabetic subjects. Therefore, people with diabetes are known to more susceptible to infections [2]. Individuals with diabetes have an underlying inflammatory state with elevated levels of pro-inflammatory cytokines and lower levels of anti-inflammatory cytokines, both of which cause these individuals to have higher susceptibility to SARS-CoV2 infection. All this inflammatory dysregulation is a recipe for disaster if mixed with COVID-19. Both disease states have many similar pro-inflammatory mechanisms. The detrimental effect of the two together make these patients prone to develop many extensive infections including fungal [3].

Plethora of mucormycosis, mostly rhino-orbital/rhino-cerebral mucormycosis cases were reported from India, in COVID-19 patients who were diabetic and needed corticosteroids therapy for controlling sever COVID-19. Patients with coronavirus 2 (SARS-CoV-2) associated severe acute respiratory syndrome, uncontrolled diabetes mellitus and corticosteroid use have significant increase in angioinvasive maxillofacial mucormycosis [4]. The present case discusses extensive Tinea infection in post COVID-19 patient living with Type-2 Diabetes Mellitus (T2DM).

Case presentation

A 58-year-old male with history of T2DM for 27 years presented with progressively increasing skin lesions on his back, gluteal area and back of thigh over 2-month duration. His previous history includes chronic kidney disease, hypertension, dyslipidemia and hypothyroidism. Personal history included regular smoking (a pack per day) for 20 years and approximately 20 units of alcohol a week. Current medication included Telmisartan (40mg OD), Amlodipine (10mg OD), Rosuvastatin (10mg OD) and Levothyroxine (100mcg OD). For treatment of T2DM patient was on twice a day Insulin analogue co-formulation.

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

Around 3 months back, patient has developed RTPCR positive COVID-19 infection with involvement of lower respiratory tract with dip in peripheral oxygen saturation (SpO_2). His chest CT scan score was 12 (moderate severity) [5]. Patient had to be hospitalised for management of acute respiratory distress syndrome (ARDS) on day 6 of his illness. During hospitalisation, he received deflazacort 30mg once daily and subcutaneous Rivoraxaban 0.6mg twice daily in addition to oxygen support and symptomatic treatments including broad spectrum antibiotics. During hospitalisation, the patient was put on basal bolus regimen of insulin analogue with inadequate glycaemic control. On 5th day of hospitalisation, with improvement in his respiratory symptoms he was discharged.

Nearly one month after discharge, patient noticed slightly elevated circular scaly lesions on his thighs with minimal itching. Within a week's time newer lesions appeared on back of thighs, gluteal areas, and the back. He visited at a skin clinic where patient was diagnosed with Psoriasis and local steroid ointment along with Fexofenadine (antihistamine) was started for its management. There was initial improvement in lesion and symptoms, however there was a flare up in lesions within 2 weeks and several satellite lesions appeared on all over back and gluteal region. The patient stopped taking antihistamine and continued using local steroid application.

At the time of presentation, the lesions were maculopapular with pigmentation and scaling. There were scratch marks on the skin with avulsion of skin in some areas. There were no definite ring lesions with central clearing, which is usually seen in fungal superficial skin infections. Few pustular lesions were also present in genital area. There were no inguinal lymph adenopathy and genitals were not involved. Systemic examinations did not reveal any abnormalities. HbA1c was 7.8% with fasting blood glucose of 148mg/dl. His serum creatinine was 2.2mg/dl with eGFR of 34 mL/min/1.73m^2. Spot urine albumin was 400mg/dl. His overall picture and no response to steroid did not support diagnosis of psoriasis. Poor response to local steroid and extension of disease with satellite lesions in background of immune-suppression in background of T2DM and previous history of COVID-19 with systemic steroid use in recent past, extensive tinea incognito was considered as probable diagnosis. Extensive use of local steroid seemed to have changed the physical appearance of the skin lesion with absence of the typical features of tinea infection.

Direct microscopic examination of scrapings from the skin lesion after treatment with 20% potassium hydroxide (KOH) was done. It is a quick and inexpensive bedside tool to provide evidence of dermatophyte infection. The scrapings were characterized by presence of refractile, long, smooth, undulating, branching, and septate hyphal filaments with or without arthroconidiospores confirming the diagnosis of dermatophytosis. The patient was asked to stop applying local corticosteroids. He was put on local luliconazole 3% cream as it has anti-inflammatory properties along with strong antifungal effect [6]. Looking at the extensive nature of his lesion, he was also started on

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

systemic antifungal Itraconazole 200mg per day for 8 weeks. His insulin doses were modified to achieve a better glycaemic control while avoiding hypoglycaemic events. His skin lesions started responding within a week's time and showed marked improvement in 6 weeks. His oral Itraconazole was continued for another 2 weeks to avoid future relapse [6]. There was complete clearance of lesions in 8 weeks.

Discussion

Over the last few years, studies on epidemiology of dermatophytic infection from different part of India have shown a rising trend in the prevalence of cutaneous dermatophytosis with change in spectrum of infection and isolation of some uncommon species. In a study on Indian patients with diabetes, cutaneous infections were seen in 31%. Fungal infections were seen in 16% of the patients (9% had candida and 7% had dermatophytosis) [7]. Trichophyton rubrum continues to be the most common isolate with tinea corporis and cruris, the most common clinical presentation in relatively large studies from Chennai and Rajasthan [8]. However, in studies reported from New Delhi and Jaipur, Trichophyton mentagrophytes and Microsporum audouiniii10 were the most frequent isolate [9,10]. The altered forms of tinea corporis are due to use of topical corticosteroids along with antibiotics and antifungal agents.

The lesions become extensive without central clearance and at times acquire bizarre appearance and pose diagnostic challenges and mimic many dermatological conditions, e.g., psoriasis, granuloma annulare, pityriasis rosea, and Hansen's disease [11]. There is lack of qualified dermatologists in the country, especially in the rural areas. It has been observed that even trained physicians and dermatologists are prescribing the wrong strength of topical corticosteroids or for the wrong indication (Figure 1) [12].

COVID-19 likely increases the risk for fungal infections because of its effect on the immune system. Use of systemic corticosteroids to counteract the cytokine storm of the infection further suppresses the immune system. The most reported fungal infections in patients with COVID-19 include aspergillosis, invasive candidiasis, and Mucormycosis. Fungal infections resistant to antifungal treatment have also been described in patients with severe COVID-19 [13].

The above case represents an extensive manifestation of Tinea infection in a person living with T2DM and history of covid 19 infection with systemic steroid use. In immunocompromised individuals, tinea corporis may present as a disseminated skin infection or subcutaneous/deep abscess [14]. Initial use of local corticosteroids without confirming the skin lesion led to altered morphology of the fungal lesion subjecting him to prolong local steroid use.

Tinea incognito refers to a cutaneous fungal infection that has lost its classical morphological features because of the use of calcineurin inhibitors or corticosteroids. The clinical manifestations of tinea incognito are highly variable. Generally, compared with the lesion of tinea corporis, the lesion seen in tinea incognito is less erythematous and scaly, with a less defined border and is

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

typically more widespread. Pruritus is usually mild or absent. The rash can be eczema-like, rosacea-like, or discoid lupus erythematosus-like, especially on the face, and eczema-like or impetigo-like on the trunk and limbs [15]. Topical antifungal agents are generally well tolerated. Side effects are uncommon, except for rare instances of contact dermatitis. Common causes of treatment failure include poor compliance, drug resistance, reinfection from close contact and auto-inoculation, and misdiagnosis [16]. Systemic antifungal treatment is indicated if the lesion is extensive, deep (e.g., Majocchi granuloma), recurrent, chronic, or unresponsive to topical antifungal treatment; if the patient is immunodeficient; or if there are multiple site lesions [17].

In recent years, the incidence of tinea corporis refractory to terbinafine treatment has been on the rise [18]. Itraconazole seems to be more effective than terbinafine. There is no benefit in increasing the dose or using a combination regimen in the treatment of tinea. Prolonged duration of treatment is required for complete cure [19].

Conclusion

Tinea corporis is a common fungal infection and the differential diagnosis is broad and, at times, difficult due to the prior use of medications, such as calcineurin inhibitors or corticosteroids. Furthermore, diseases may present with bizarre morphology in immunocompromised patients. Newer species of dermatophytes are being detected and drug resistance to commonly used antifungals are on the rise, especially in the immunocompromised and in the wake of the new pandemic of Covid 19. Physicians must be familiar with this condition so that an accurate diagnosis can be made, and appropriate treatment initiated.

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

Figure 1: Extensive tinea incognito in a male with type 2 diabetes and prolonged local corticosteroid treatment.

References

1. Narayanan S, Chua JV, Baddley JW. Coronavirus disease 2019–associated mucormycosis: risk factors and mechanisms of disease. Clin Infect Dis. 2022;74(7):1279-83. PubMed | CrossRef
2. Lim S, Bae JH, Kwon HS, Nauck MA. COVID-19 and diabetes mellitus: from pathophysiology to clinical management. Nat Rev Endocrinol. 2021;17(1):11-30. PubMed | CrossRef
3. Singh M, Barrera Adame O, Nickas M, Robison J, Khatchadourian C, Venketaraman V. Type 2 Diabetes Contributes to Altered Adaptive Immune Responses and Vascular Inflammation in Patients With SARS-CoV-2 Infection. Front Immunol. 2022;13:833355. PubMed | CrossRef
4. Al-Tawfiq JA, Alhumaid S, Alshukairi AN, Temsah MH, Barry M, Al Mutair A, et al. COVID-19 and mucormycosis superinfection: the perfect storm. Infection. 2021;49(5):833-53. PubMed | CrossRef
5. Francone M, Iafrate F, Masci GM, Coco S, Cilia F, Manganaro L, et al. Chest CT score in COVID-19 patients: correlation with disease severity and short-term prognosis. Eur Radiol. 2020;30(12):6808-17. PubMed | CrossRef
6. Sahoo AK, Mahajan R. Management of tinea corporis, tinea cruris, and tinea pedis: A comprehensive review. Indian Dermatol Online J. 2016;7(2):77. PubMed | CrossRef
7. Goyal A, Raina S, Kaushal SS, Mahajan V, Sharma NL. Pattern of cutaneous manifestations in diabetes mellitus. Indian J Dermatol. 2010;55(1):39-41. PubMed | CrossRef
8. Lakshmanan A, Ganeshkumar P, Mohan SR, Hemamalini M, Madhavan R. Epidemiological and clinical pattern of dermatomycoses in rural India. Indian J Med Microbiol. 2015;33:134-6. PubMed | CrossRef
9. Sharma Y, Jain S, Chandra K, Khurana VK, Kudesia M. Clinico-mycological evaluation of dermatophytes and non-dermatophytes isolated from various clinical samples: A study from north India. J Res Med Sci. 2012;17(8):817-18. PubMed | CrossRef
10. Agarwal U, Saran J, Agarwal P. Clinico-mycological study of dermatophytes in a tertiary care centre in northwest India. Indian J Dermatol Venereol Leprol. 2014;80(2):194. PubMed | CrossRef
11. Dogra S, Uprety S. The menace of chronic and recurrent dermatophytosis in India: Is the problem deeper than we perceive? Indian Dermatol Online J. 2016;7(2):73. PubMed | CrossRef
12. Kumar S, Goyal A, Gupta YK. Abuse of topical corticosteroids in India: Concerns and the way forward. J Pharmacol Pharmacother. 2016;7(1):1-5. PubMed| CrossRef
13. Meijer EFJ, Dofferhoff ASM, Hoiting O, Buil JB, Meis JF. Azole-Resistant COVID-19-Associated Pulmonary Aspergillosis in an Immunocompetent Host: A Case Report. J Fungi (Basel). 2020;6(2):79. PubMed | CrossRef
14. Brown J, Carvey M, Beiu C, Hage R. Atypical Tinea Corporis Revealing a Human Immunodeficiency Virus Infection. Cureus. 2020;12(1):e6551. PubMed | CrossRef
15. Del Boz J, Crespo V, Rivas-Ruiz F, de Troya M. Tinea incognito in children: 54 cases. Mycoses. 2011;54(3):254-8. PubMed | CrossRef
16. Moriarty B, Hay R, Morris-Jones R. The diagnosis and management of tinea. BMJ. 2012;345:e4380. PubMed | CrossRef
17. Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas CR, Sardana K, et al. Expert consensus on the management of dermatophytosis in India (ECTODERM India). BMC Dermatol. 2018;18(1):1-1. PubMed | CrossRef
18. Bhatia A, Kanish B, Badyal DK, Kate P, Choudhary S. Efficacy of oral terbinafine versus itraconazole in treatment of dermatophytic infection of skin-A prospective, randomized comparative study. Indian J Pharmacol. 2019;51(2):116-9. PubMed | CrossRef

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030

19. Singh SK, Subba N, Tilak R. Efficacy of Terbinafine and Itraconazole in Different Doses and in Combination in the Treatment of Tinea Infection: A Randomized Controlled Parallel Group Open Labeled Trial with Clinico-Mycological Correlation. Indian J Dermatol. 2020;65(4):284-9. PubMed | CrossRef

Citation: Srivastava MK, Chandra KP. Extensive Tinea Infection in a Post Covid 19 Patient of Type 2 Diabetes-A Case Study. J Endo Metabol Res. 2022;3(2):1-6.
DOI: https://doi.org/10.37191/Mapsci-2582-7960-3(2)-030