ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 12 | December - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

INCIDENCE AND EPIDEMIOLOGY OF ONYCHOMYCOSIS IN PATIENTS VISITING A TERTIARY CARE HOSPITAL IN TAMIL NADU

Microbiology

Dr. Thilakavathy C P	Undergraduate, Saveetha Medical College, Thandalam, Chennai-602105, India
Dr. A. Thillaikkarasi	Assistant professor, Department of Dermatology, Venereology & Leprosy, Saveetha Medical College, Thandalam, Chennai-602105, India
Dr. Neha Mariam Joseph*	Postgraduate, Department of Dermatology, Venereology & Leprosy, Saveetha Medical College, Thandalam, Chennai-602105, India *Corresponding Author
Dr. Aruna. D	Assistant Professor, Department of Microbiology, Saveetha Medical College and hospital, Chennai.

ABSTRACT

Introduction: Onychomycosis is the chronic fungal infection of the nails. Most commonly, dermatophytes are responsible for onychomycosis, but non-dermatophyte fungus and molds also account for a significant number of cases. Tinea unguium can be identified by the presence of debris under damaged and discolored nails. **Aim:** To study the incidence and epidemiology of onychomycosis in patients visiting Dermatology OPD at Saveetha Medical college. **Materials And Methods:** A total of 100 patients with nail changes of both sexes and all ages, irrespective of their presenting symptoms, were included in the study. Nail abnormalities were noted including nail plate surface, color and shape of the nail, and nail fold abnormalities. Specific investigations such as KOH mount and fungal cultures of nail clippings were done. An informed consent was taken from all patients and findings were recorded on a performa. **Results:** As per our observation, most of the people found with any deformity or destruction had no growth on their nail, but few results showed growth of organisms. Majority of them were having growth of Candida albicans (14.0%), followed by Aspergillus niger (8.0%). **Conclusion:** Nails, in spite of being easily accessible for examination, are often overlooked. A variety of nail changes occur in various dermatological conditions and may be helpful in achieving a diagnosis. Keeping the nails clean, dry & trimmed is essential to maintain hygiene and prevent infections. In this era of the well-developed cosmetology world, nails have become an area of aesthetic concern and need further studies for preventive measures.

KEYWORDS

Onychomycosis, Dermatophytes, Candida

INTRODUCTION:

Onychomycosis is the chronic fungal infection of the nails.[1] Most commonly, dermatophytes are responsible for onychomycosis, but non-dermatophyte fungus and molds also account for a significant number of cases. Tinea unguium can be identified by the presence of debris under damaged and discoloured nails.[2]

Candidal onychomycosis (CO) generally does not cause severe deformities. [3] Non-dermatophyte fungi accounts for 1.5% to 6% of onychomycosis cases, and most commonly occur post traumatically in elderly patients.[4] Onychomycosis affects 5.5% of the world's population [5] and approx. 30% of skin fungal infections [6]. The prevalence of onychomycosis in the Indian population ranges from 0.5% to 5%.[7]

The incidence is particularly high in hot and humid climates [8]. Researchers have identified certain habits of people from the Indian subcontinent such as walking barefoot, wearing ill-fitting shoes, nail biting, exposure to chemicals as contributing factors to onychomycosis. [9] Several studies have shown that the incidence of onychomycosis increases with age, which may be related to poor peripheral circulation, diabetes, repeated nail trauma, chronic exposure to pathogenic fungi, a weak immune system, inactivity, or inability to trim toenails and groom feet.[10]

Nail infections are a cosmetic problem with significant physical and psychological morbidity and also serve as a fungal reservoir for skin infections. In addition to destroying and deforming the nail plate, onychomycosis can lead to disturbances in daily activities.[11] Onychomycosis is classified as distal lateral subungual onychomycosis, proximal subungual onychomycosis, white superficial onychomycosis, endonyx and total dystrophic onychomycosis. Discoloration and other onychoses differ from onychochymosis.[12]. Fungal infections and other skin conditions require laboratory tests to accurately differentiate them before starting treatment. Our hospital-based study sought to determine the incidence and epidemiology of onychomycosis by analyzing 100 participants with clinically suspected onychomycosis. We evaluated prevalence based on age, sex, and as well as the most common pathogens.

MATERIALS AND METHODS:

It is a cross-sectional study conducted among 100 patients with clinically suspected onychomycosis who visited the dermatology department at the Saveetha Medical College and hospitals, Chennai between January 2022 to October 2022. Informed consent was obtained from all participants.

A complete medical history was obtained, and a detailed examination of the deformed nail was performed. Patient history and demographic factors such as age, gender and related history of risk factors for onychomycosis were recorded proforma. Certain details such as itching, family history of fungal infection and previous skin infections were recorded. Patients treated with systemic or topical antifungals within 4 weeks before the study period were excluded to avoid false negative results and to avoid the effects of antifungals on disease progression.

Clinical manifestation of discoloration, subungual hyperkeratosis, and nail thickening affecting the distal and/or lateral nail plate was defined as distal lateral subungual onychomycosis; discoloration and onycholysis affecting proximal part of the nail was defined as proximal subungual onychomycosis ; association with paronychia and distal and lateral onycholysis was defined as candidal onychomycosis ; white opaque patches on the nail surface were defined as white superficial onychomycosis; and end-stage nail disease was defined as total dystrophic onychomycosis.

Nail clipping was done for each patient. Before sampling, the nails were cleaned with a 70% alcohol solution. Nail clippers obtained using presterilized clippers were placed on sterile black paper. Each nail sample is divided into two parts: one for direct microscopy and one for culture. Nail clippings were subjected to microscopic examination by 20 % potassium hydroxide solution. Culture was done with Sabouraud dextrose agar (incubated at 27 degrees Celsius for molds and 37 degrees Celsius for fungus). Culture tubes were examined daily for the first week and on alternate days thereafter for 4 weeks of incubation. Dermatophytes were classified based on colony morphology, growth rate, texture, margin, and pigmentation.

RESULTS:

Out of 100 clinically suspected cases of onychomycosis, 78 (58.2%) were from fingernails and 56 (41.8%) from toenails. Clinical diagnosis

was confirmed in 96 (71.6%) cases by both fungal culture and direct microscopy but was confirmed by direct microscopy alone in only 76 (56.7%) cases. The study included 60% males and 40% females.

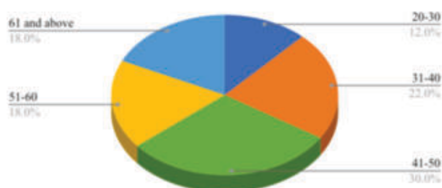

Chart 1. Age distribution

The chart shows that the maximum number of patients with nail changes were in the age group of 41- 50 years, followed by in the age group of 31-40 years, followed by older ages and younger ages.

Chart 2. Sex distribution

The chart shows that out of 100 patients, 60% were males, while 40% were females. Male to female ratio was 1.5:1.

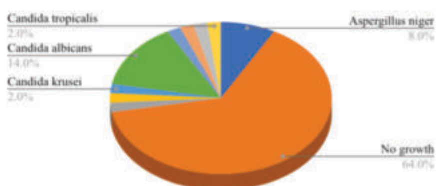

Chart 3. Organism involved in nail changes:

The chart shows that the majority of people (64.0%) with nail destruction and deformity had no growth shown in investigation. In the patients whose samples showed growth, majority of them had Candida albicans (14.0%), followed by Aspergillus niger (8.0%), followed by other species of the candida organism.

Distal lateral subungual onychomycosis was the most prevalent clinical pattern found in 66 (49.3%) participants; fungal isolates were found in 36 of these participants. The next most prevalent clinical pattern was PSO. A clinical pattern of CO was noted in 20.9% participants, 22 showing fungal growth; WSO was noted in 7.5% participants, 2 showing fungal growth.

Out of 36 culture-positive cases, Candida albicans were the most common pathogens isolated in 14% participants, followed by Aspergillus niger in 8 % participants. Among candida species, 14% were positive for Candida albicans, 2% found positive for Candida krusei and 2% were positive for Candida tropicalis.

DISCUSSION:

Fungus known to cause onychomycosis varies between geographic areas, mainly due to climatic differences. [14]. The onychomycosis isolation rate in our hospital study was 71.6%, which is in line with several studies in India and the rest of the world. abroad, including 60% in Karnataka, India [5]; 82.3% in Sikkim, India [6]; and 86.9% in Turkey [1]. However, other studies have shown 39.5% lower isolation rates in central Delhi, India, [15] and 37.6% lower in Himachal Pradesh, India. [16] Some patients with onychomycosis may not seek medical attention, which may explain the difference in onychomycosis prevalence observed worldwide [17].

The prevalence of onychomycosis also varies by age. In our study, participants over 40 showed the highest prevalence (47.8%), consistent with other studies in India [18] and abroad. [19,20]. In contrast, some Indian studies [15,21,22] have reported a higher prevalence in younger adults (i.e., 21-30 years old), which may be due to greater self-consciousness of the discoloration and nail disfigurement, increased physical activity and different shoe-wearing habits. Higher prevalence in older adults, as observed in our study as well as other studies [19,21] may be due to poor peripheral circulation, diabetes mellitus, repeated nail trauma, prolonged exposure to fungal pathogens, suboptimal immune function, inactivity and poor hygiene. [10] These results are consistent with numerous studies in world literature. [1,10,15,16] A higher rate of isolation among males worldwide may be due to the frequent use of occlusive footwear and greater exposure to outdoor conditions and greater physical activity, leading to an increased likelihood of trauma. The importance of nail trauma as a predisposing factor for onychomycosis is well established. [24] If not treated successfully, onychomycosis can serve as a reservoir for fungal infections that can affect other parts of the body and possibly spread the infection to others.

CONCLUSION:

No cutaneous examination is complete without a careful evaluation of the nails. Nails remain an understudied and yet quite accessible structure that lends itself to evaluation. Keeping the nails clean, dry and trimmed is essential to maintain hygiene and prevent infections. Therefore, both clinical and mycological examinations are important for the diagnosis and selection of the most appropriate antifungal agent, which is only possible if the underlying pathogen has been correctly identified. In this era of the well-developed cosmetology world, nails have become an area of aesthetic concern and further studies are required for prevention of onychomycosis.

REFERENCES:

1. Yenisehirli G, Bulut Y, Sezer E, et al. Onychomycosis infections in the Middle Black Sea Region, Turkey. Int J Dermatol. 2009;48:956-959.
2. Kouskoukis CE, Scher RK, Ackerman AB. What histo- logic finding distinguishes onychomycosis and psoriasis? Am J Dermatopathol. 1983;5:501-503.
3. Rippon JW. Medical mycology. In: Wonsiewicz M, ed. The Pathogenic Fungi and the Pathogenic Actinomycetes. 3rd ed. Philadelphia, PA: WB Saunders; 1988:169-275.
4. Greer DL. Evolving role of nondermatophytes in onycho- mycosis. Int J Dermatol. 1995;34:521-524.
5. Murray SC, Dawber RP. Onychomycosis of toenails: ortho- paedic and podiatric considerations. Australas J Dermatol. 2002;43:105-112.
6. Achten G, Wanet-Rouard J. Onychomycoses in the labo- ratory. Mykosen Suppl. 1978;1:125-127.
7. Sobhanadri C, Rao DT, Babu KS. Clinical and mycologi- cal study of superficial fungal infections at Government General Hospital: guntur and their response to treatment with hamycin, dermostatin and dermamycin. Indian J Dermatol Venereol. 1970;36:209-214.
8. Jain S, Sehgal VN. Commentary: onychomycosis: an epidemio-etiologic perspective. Int J Dermatol. 2000;39:100-103.VOLUME 95, JANUARY 2015 E25 Copyright Cutis 2015. No part of this publication may be reproduced, stored, or transmitted without the prior written permission of the Publisher. WWW.CUTIS.COM Onychomycosis Incidence
9. Sehgal VN, Aggarwal AK, Srivastava G, et al. Onychomycosis: a 3 year clinicomycologic hospital-based study. Skinmed. 2007;6:11-17.
10. Elewski BE, Charif MA. Prevalence of onychomyco- sis in patients attending a dermatology clinic in north- eastern Ohio for the other conditions. Arch Dermatol. 1997;133:1172-1173.
11. Scher RK. Onychomycosis is more than a cosmetic prob- lem. Br J Dermatol. 1994;130(suppl 43):S15.
12. Godoy-Martinez PG, Nunes FG, Tomimori-Yamashita J, et al. Onychomycosis in São Paulo, Brazil [published online ahead of print May 8, 2009]. Mycopathologia. 2009;168:111-116.
13. Larone DH. Medically Important Fungi: A Guide to Identification. 4th ed. Washington, DC: American Society for Microbiology Press; 2002.
14. Sehgal VN, Srivastava G, Dogra S, et al. Onychomycosis: an Asian perspective. Skinmed. 2010;8:37-45.
15. Sanjiv A, Shalini M, Charoo H. Etiological agents of ony- chomycosis from a tertiary care hospital in Central Delhi, India. Indian J Fund Appl Life Science. 2011;1:11-14.
16. Gupta M, Sharma NL, Kanga AK, et al. Onychomycosis: clinic-mycologic study of 130 patients from Himachal Pradesh, India. Indian J Dermatol Venereol Leprol. 2007;73:389-392.
17. Eleweski BE. Diagnostic techniques for confirming ony- chomycosis. J Am Acad Dermatol. 1996;35(3, pt 2):S6-S9. 18. Das NK, Ghosh P, Das S, et al. A study on the etiologi- cal agent and clinico-mycological correlation of finger- nail onychomycosis in eastern India. Indian J Dermatol. 2008;53:75-79.
19. Bassiri-Jahromi S, Khaksar AA. Nondermatophytic moulds as a causative agent of onychomycosis in Tehran. Indian J Dermatol. 2010;55:140-143.
20. Bokhari MA, Hussain I, Jahangir M, et al. Onychomycosis in Lahore, Pakistan. Int J Dermatol. 1999;38:591-595.
21. Jesudanam TM, Rao GR, Lakshmi DJ, et al. Onychomycosis: a significant medical problem. Indian J Dermatol Venereol Leprol. 2002;68:326-329.
22. Ahmad M, Gupta S, Gupte S. A clinico-mycological study of onychomycosis. EDOJ. 2010;6:1-9.
23. Vinod S, Grover S, Dash K, et al. A clinico-mycological evaluation of onychomycosis. Indian J Dermatol Venereol Leprol. 2000;66:238-240.
24. Veer P, Patwardhan NS, Damle AS. Study of onychomycosis: prevailing fungi an pattern of infection. Indian J Med Microbiol. 2007;25:53-56.
25. Garg A, Venkatesh V, Singh M, et al. Onychomycosis in central India: a clinicoetiologic correlation. Int J Dermatol. 2004;43:498-502.
26. Adhikari L, Das Gupta A, Pal R, et al. Clinico-etiologic correlates of onychomycosis in Sikkim. Indian J Pathol Microbiol. 2009;52:194-197.