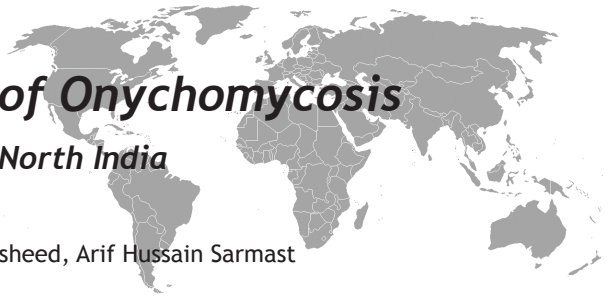

Clinico-Mycological Pattern of Onychomycosis

A single center one year study in Kashmir-North India

Rubina Lone, Hakim Irfan Showkat, Deeba Bashir, Syed Khursheed, Arif Hussain Sarmast

ABSTRACT

Onychomycosis is a major public health problem with high incidence, associated morbidity and long lasting treatment with anti-fungal agents. This study was carried out to know the clinico-mycological pattern of onychomycosis which can help in the control of this infection. The aim of this study was to determine the prevalence of various causative agents of onychomycosis, to identify the clinical pattern and to analyze the risk factors. This was a prospective study carried over a period of one year from Ist February 2010 to 31st january 2011 on samples from 150 patients with clinically suspected nail infections attending the dermatology department of SKIMS Medical college, Kashmir. The nails were evaluated clinically and the nail samples were subjected to direct microscopy and culture. 66.6% samples were positive by direct microscopy and culture. Males were infected more than females. The commonest age group infected was 21-30 years. Finger nails were affected more frequently than toe nails and distolateral subungal onychomycosis was the most common clinical type seen in 66% patients. The etiological agents were dermatophytes (62.68%), NDM (29.85%), yeasts (7.46%). Among dermatophytes T. rubrum was the commonest etiological agent.

Key words: *Nail, candida, onychomycosis, yeast,dermatophyte, agar*

Onikomikozların Kliniko-Mikolojik Özellikleri: Kuzey Hindistan Kaşmir'den Bir Tek Merkezli Bir Yıllık Çalışma

ÖZET

Onikomikozler yüksek insidans ile birlikte morbidite ve anti-fungal ajanlar ile uzun süren tedavi gerektiren önemli bir halk sağlığı problemidir. Bu çalışma enfeksiyon kontrolünde yardımcı olabilecek onikomikoza ait kliniko-mikolojik özellikleri tespit etmek amacıyla planlandı. Bu çalışmanın amacı, risk faktörlerini analiz etmek ve klinik özellikleri tespit edebilmek için, onikomikozun değişik etken ajanlarının prevelansını belirlemekti. Bu çalışma 1 Şubat 2011-31 Ocak 2012 tarihleri arasında 1 yıllık periyotta SKIMS Kaşmir Tıp Fakültesi dermatoloji bölümüne başvuran klinik olarak tırnak enfeksiyonu şüphesi olan 150 hastadan alınan örnekler üzerinde yapılan prospektif bir çalışmadır. Tırnaklar klinik olarak değerlendirildi ve tırnak örnekleri direkt mikroskopi ve kültür yapılarak ile incelendi. Örneklerde %66.6'sı direkt mikroskopi ve kültürde pozitif idi. Erkekler bayanlardan daha fazla enfekte idi. En sık enfekte yaş grubu 21-30 yaş arası idi. El tırnakları ayak tırnaklarından daha fazla enfekte idi ve %66 hastada görülen distolateral subungal onikomikoz en sık klinik tip idi. Etiyolojik ajanlar dermatofit (%52.68), NDM (%29.85) ve yeast (%7.46) idi. Dermatofitler arasında T. Rubrum en sık etiyolojik ajan idi.

Anahtar kelimeler: *Tırnak, kandida, onikomikoz, dermatofit, agar*

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INTRODUCTION

Onychomycosis is a term used to describe fungal infection of one or more of nail units and can be caused by dermatophytes, yeasts or non-dermatophyte moulds and represents upto 20% of all nail disorders (1). Clinically onychomycosis is classified into various types; distolateral subungal onychomycosis (DLSO), superficial white onychomycosis (SWO), proximal subungal onychomycosis (PSO), candidal onychomycosis (CO), and total dystrophic onychomycosis (TDO) (2,3). The prevalence of onychomycosis is determined by age, predisposing factor, social class, occupation, climate, living environment and frequency of travel (4). The worldwide incidence of onychomycosis is increasing and a number of factors contribute to this rise like immunocompromised status because of HIV, immunosuppresive therapy, cancer chemotherapy or increased antibiotic usage (5). Although onychomycosis is all too often regarded as merely a cosmetic problem which is rarely life threatening, its high prevalence and the associated morbidity makes it an important public health problem (1). Onychomycosis resembles several diseases in the field of dermatology and medicine, so it is necessary to diagnose the infection with some laboratory evidence before treatment with anti-fungal agents whose duration of treatment is long and may have some serious side effects (6). The incidence of onychomycosis is high in Indian sub-continent because warm and humid climate, poverty, overcrowding and lack of medical facilities contribute to high prevalence of disease. Its prevalence varies from 0.5-45% in different parts of India. Since the patients with dystrophic nails seeking medical advice is increasing, so the present study was carried out to determine the prevalence of various causative agents of onychomycosis, to identify the clinical pattern of this disease in our part of world and to analyze the potential risk factors.

MATERIALS AND METHODS

Study population and period: This study was conducted over a period of one year from Ist february 2010 to31st January 2011 on samples from 150 patients with clinically suspected nail infections attending the dermatology out-patient department of SKIMS Medical College Srinagar.

A detailed history of patients was taken. It included age, sex, socioeconomic status, occupation, and trauma, predisposing disease such as diabetes, cardiovascular disease, sharing of common facilities, previous onychomycosis, and history of similar illness in family members. The clinical pattern and location of disease was also documented.

Sample Collection and Processing

The specimens were collected for microbiological analysis on the basis of the results of clinical evaluation. Samples from clinical abnormal nails were collected by vigorously scraping the distal portion of the nail, the nail undersurface as well as nail bed after cleaning the area with 80% alcohol to remove contaminants with a no 15 scalpel blade. The specimens were analyzed by direct microcopy and culture.

Direct microscopy

Specimens were placed on slide and a drop of 20% KOH (potassium hydroxide) was added. Microscopic examination was carried for the presence of fungal elements af-

***Table 1**. Results of direct examination*

KOH Positive		KOH Negative	
Culture	*Positive*	*Culture*	*Negative*
59	*33*	*8*	*50*

***Table 2**. Shows age wise distribution of patients with onychomycosis*

Age group	*Male*	*Female*	*Total*
0-10	*2*	*-*	*2*
11-20	*5*	*4*	*9*
21-30	*28*	*18*	*46*
31-40	*16*	*10*	*26*
41-50	*8*	*4*	*12*
51-60	*2*	*2*	*4*
>60	*1*	*-*	*1*
Total	*62*	*38*	*100*

***Table 3**. Distribution of patients showing morphological patterns of onychomycosis*

Pattern	*Fingernails*	*Toenails*	*Both*	*Total*
DLSO	*36*	*16*	*14*	*66*
PSO	*9*	*6*	*1*	*16*
SWO	*5*	*3*	*-*	*8*
TDO	*-*	*2*	*4*	*6*
Paronychia	*4*	*-*	*-*	*4*
Total	*54*	*27*	*19*	*100*

Table 4. *shows distribution of patients with onychomycosis on the basis of KOH and cultural characteristics.*

Culture	*KOH Positive*	*KOH Negative*	*Total*
T. rubrum	*24*	*-*	*24*
T. mentagrophytes	*18*	*-*	*18*
A. niger	*6*	*4*	*10*
Alternaria	*9*	*0*	*8*
Penicillium	*0*	*1*	*1*
Curvularia	*0*	*1*	*1*
Candida	*3*	*2*	*5*
Total	*59*	*8*	*67*

ter incubating the slide for two hours or until digestion of specimen occurred.

Culture

Culture was done using: 1. Saboraud dextrose agar without antibiotics 2. Saboraud dextrose agar with 5% Chloramphenicol and cycloheximide. Both media were used in duplicate to be kept at 25°C and 37°C and were examined daily for six weeks before declaring them negative. The growths were noted for colony characteristics in the form of rate of growth, texture of growth, surface color, and color on reverse and diffusible pigment. For microscopic morphology, tease mounts, cellophane tape mounts and slide cultures were done. Yeasts were identified on the basis of germ tube tests, microscopic morphology on corn meal agar and color production on CHROMAGAR candida culture medium (Becton Dickinson)

The criteria to report to report NDM as pathogens were direct microscopy positive and isolation of same fungi in second sample obtained some days later.

RESULTS

Out of 150 patients 100 (66.6%) showed positive results by direct examination and culture. As shown in Table 1, direct examination was positive in 92 (61.33%) and fungal culture was positive in 67 (44.66%) patients. Clinical specimens from 33 patients were positive in microscopic examination but had negative culture. Samples from 8 patients were positive in culture and negative in direct examination. Among 100 patients with onychomycosis 62 (62%) were males and 38 (38%) were females with a male to female ratio of 1.63: 1

The mean age of patients with onychomycosis was 34.5 years (range 8-75 years). Highest number of patients 46% was seen in the age group 21-30 years followed by the age group 31-40 years (26%). The finger nails were involved in 54 (54%) patients whereas toe nails were involved in 27(27%) patients. Both finger and toe nails were involved in 19 (19%) patients. Table 3 shows distribution of patients showing morphological patterns of onychomycosis. Distal and lateral subungal onychomycosis (DLSO) was the commonest clinical pattern followed by proximal subungal onychomycosis (PSO), superficial white onychomycosis (SWO), total dystrophic onychomycosis (TDO) and paronychia.The most common organism isolated in culture were dermatophytes 42 (62.68%) followed by Aspergillus spp 10 (14.92%), Alternaria 8 (12.11%), Penicillium 1(1.49%), Curvularia 1(1.49%), Candida 5 (7.46%). The most common dermatophyte was Trichophyton rubrum followed by Trichophyton mentagrophytes.

DISCUSSION

In the present study 66.6% samples were positive by direct examination and culture. In the study conducted by Kaur et al. 54.5% samples were positive by direct examination and/or culture (7). In our study fungal infection was diagnosed in 100 samples by direct microscopy and culture. Using this as denominator KOH had a sensitivity of 82% and culture 58%. Weinberg et al. repoted that the sensitivity of KOH and culture in detecting positive infections were 80% and 59% respectively (8). The study conducted by Manjunath Shenoy et al showed that KOH and culture had 64% and 42% sensitivity in detecting positive infections (7).

In our study 62% patients with onychomycosis were males and 38% were females with a male female ratio of 1.63:1. Although there have been reports of greater susceptibility of females to this infection, (9) in our study males were dominant. In the study conducted by Garg et al males were infected more than females (10). The increased prevalence of onychomycosis in men could be due to nail trauma and more common use of occlusive footwear. In the present study highest numbers of patients (46%) were in the age group 21-30 years followed by age group 25-45 years (26%). Adhikari et al also found a higher prevalence of onychomycosis in the similar age group (11). The increased prevalence of in young age could be because of occupation related trauma and

cosmetic awareness. In our study distolateral subungal onychomycosis was the commonest clinical pattern in 66% cases followed by proximal subungal onychomycosis (16%) as was found in other studies (12,13). The present study showed finger nails were involved more often than toe nails. Although toe nails have been reported to be more commonly involved, (1) our finding is in accordance with many other studies in which finger nails were found to be more frequently affected (12,13).

In our study the most common organism isolated in culture were dermatophytes (62.68%), NDM (29.85%) and candida (7.46%). This finding is in accordance with many studies which have demonstrated a greater prevalence of dermatophytes as the etiological agents of onychomycosis (7,13,14) and in contrast to other which have found yeasts as the most common agents (15,16). Among the dermatophytes, T. rubrum was the most common etiological agent in our study followed by T. mentagrophytes. Although some studies have reported T. mentagrophytes the most common dermatophyte (7), our finding is in concordance with many other studies which found T. rubrum as the most common dermatophyte responsible for onychomycosis (9,17). Among the NDM A. niger was the commonest isolate. Kaur et al and Grover et al also found A. niger to be the most common NDM responsible for onychomycosis (7,12).

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