

## CLINICO-Microbiological Study of Onychomycosis in Tertiary Care Hospital, GGH, Guntur.

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### Abstract :

**BACKGROUND:** Onychomycosis accounts for one third of fungal skin infections. The clinical presentation is often confused with other conditions, making laboratory diagnosis and confirmation necessary. Accurate identification of etiological agent is important, as the treatment is different for dermatophytes and non dermatophytes.

**AIMS AND OBJECTIVES:** 1.To isolate and identify the causative agents for onychomycosis. 2. To study the occupational status of the study group.

**METHODOLOGY:** The present study was conducted in the department of D.V.L, GGH, Guntur. Among the 45 suspected cases of onychomycosis, nail clippings were taken and sent to microbiological department for microscopy and fungal culture by standard laboratory techniques.

**RESULTS:** Fungi was demonstrated in 18 cases(40%) either by KOH or culture. Among the 18 cases 15 (83.3%) were dermatophytes followed by yeasts 2 (11.1%) and non dermatophytemoulds 1(5.6%). In the dermatophytes, *T.rubrum* 10 (55.56%) was the most common followed by *T.mentagrophyte* 5 (27.78%). In the yeast *C.albicans*(11.1%) and in the nondermatophytes *Aspergillusflavus* (5.55)was only isolated. The finger nails was commonly involves than toe nails. Most of the infection was seen in housewives followed by farmers.

**CONCLUSION:** The most common cause for onychomycosis is *T.rubrum*,dermatophytic fungus and the least being nondermatophytes like *aspergillus* sps. As treatment is different for each group accurate diagnosis by culture and microscopy is required.

**KEYWORDS:** Onychomycosis, Dermatophytes, Yeast.

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### I. Introduction

Onychomycosis means fungal infection of one or more of nail units. It is caused by dermatophytes, yeasts or non-dermatophyte moulds. It represents upto 30% of mycotic cutaneous infections [1]. Onychomycosis is classified clinically into; Disto-Lateral Subungal Onychomycosis (DLSO), Superficial White Onychomycosis (SWO), Proximal Subungal Onychomycosis (PSO), Endonyx Onychomycosis (EO), Candidal Onychomycosis (CO), and Total Dystrophic Onychomycosis (TDO) [2-4]. The prevalence of onychomycosis depends on age, predisposing factors, social class, occupation, climate, living environment and frequency of travel [5]. The worldwide incidence of onychomycosis is on rise, due to various factors like an immunocompromised status which is caused by HIV, immunosuppressive therapy and cancer chemotherapy or increased antibiotic usage [6]. Although onychomycosis is often regarded as a cosmetic problem, 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. The duration of treatment is long and may have some serious side effects [7]. The incidence of onychomycosis is high in Indian sub-continent due to factors like warm and humid climate, poverty, overcrowding and lack of medical facilities. Since the patients with dystrophic nails who seek medical advice is increasing, 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 hospital and to analyze the potential risk factors.

### II. Material And Methods

#### Study Period:

The present study was conducted in the department of D.V.L, GGH, Guntur, for a period of 6 months from February to July, 2017.

#### Inclusion Criteria:

All patients with a clinical diagnosis of onychomycosis were included in the study.

#### **Exclusion Criteria**

The samples of patients who had taken anti fungal drugs were excluded from the study.  
Not willing to give samples.

#### **PROCEDURE**

A detailed history of suspected cases was taken in relation to name, age, sex, address, occupation and involvement of more than one site. Among the 45 suspected cases of onychomycosis, samples were taken by vigorously scraping the distal portion of the nail, the nail undersurface as well as nail bed and sent to microbiological department for microscopy and fungal culture by standard laboratory techniques.

#### **DIRECT MICROSCOPY**

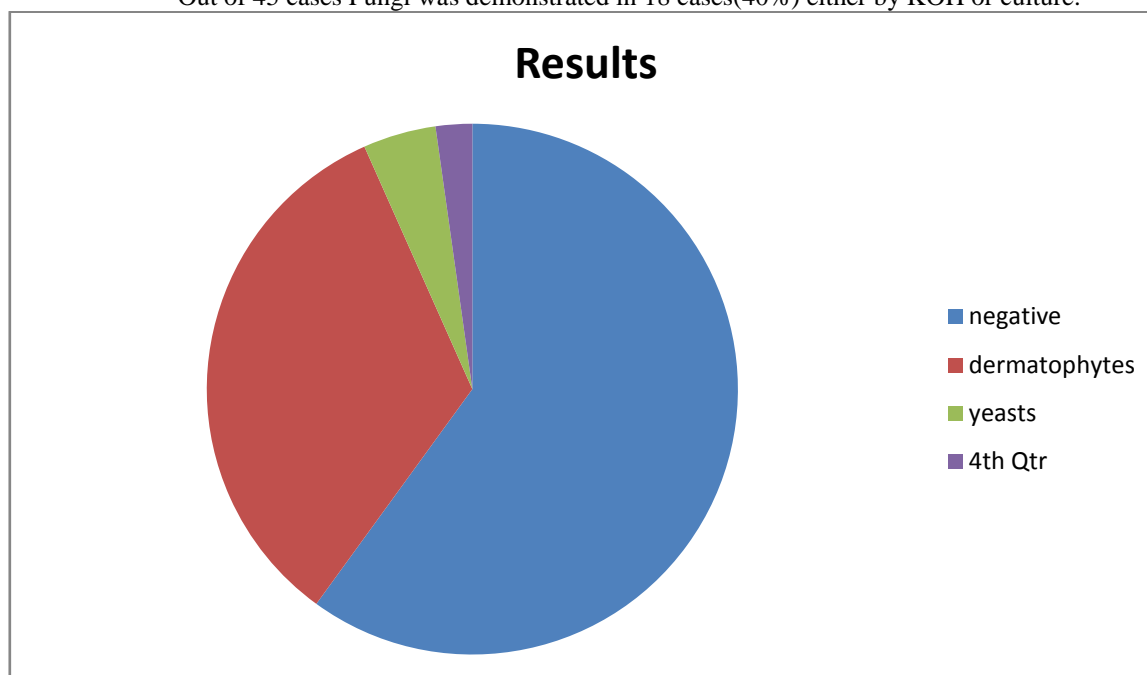
Specimens were placed on slides and one drop of 20% Potassium Hydroxide (KOH) was added to each slide. A microscopic examination was carried for the presence of fungal elements after incubating the slides for two hours or until digestion of specimens occurred [8].

#### **CULTURE**

Culture was done by using: 1. Sabouraud's dextrose agar without antibiotics and 2. Sabouraud's dextrose agar with 5% Chloramphenicol and cycloheximide. Both were cultured at 25°C and 37°C. They were examined daily for six weeks before they were declared as negative. The growths were noted for colony characteristics in the form of rate of growth, texture of growth, surface colour, and colour on reverse and diffusible pigments. For microscopic morphology, tease mounts, cellophane tape mounts and slide cultures were done [9,10].

### **III. Results**

Out of 45 cases Fungi was demonstrated in 18 cases(40%) either by KOH or culture.

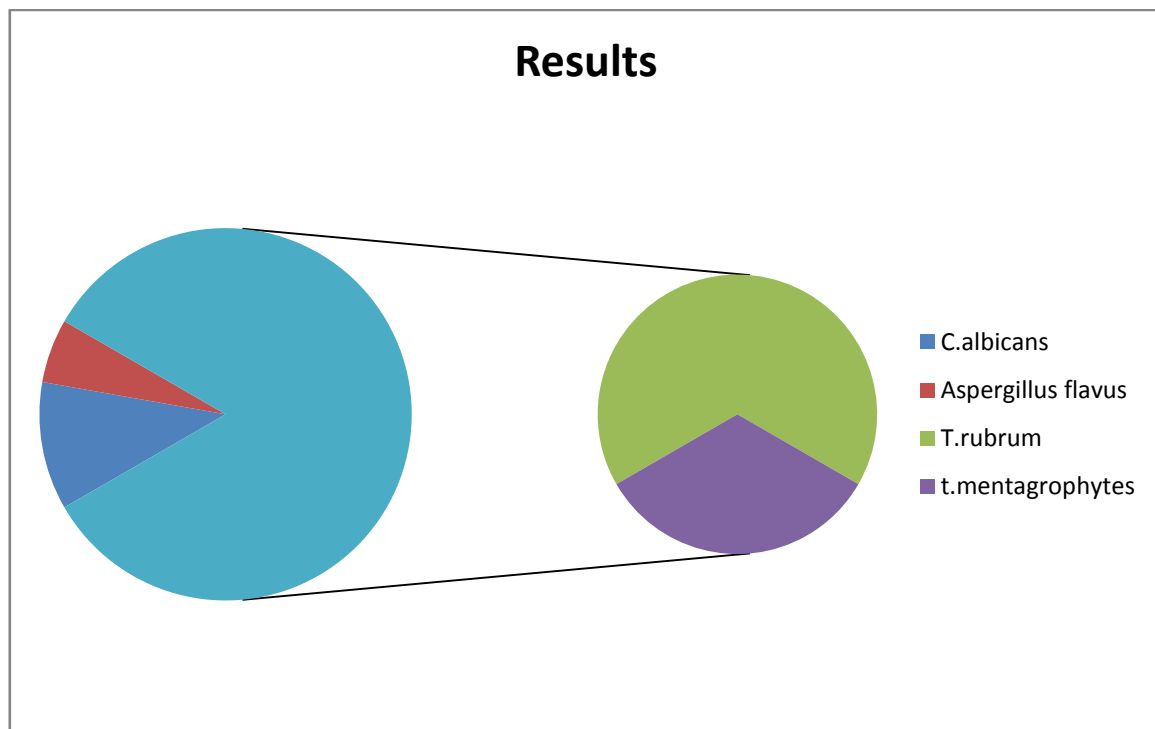


Among the 18 cases, 15 (83.3%) - dermatophytes  
2 (11.1%) - yeasts and  
1 (5.6%) - non dermatophytemoulds .

In the dermatophytes, *T.rubrum* 10 (55.56%),  
*T.mentagrophyte* 5 (27.78%).

In the yeasts. *C.albicans*(11.1%) -2cases and

In the nondermatophytes , *Aspergillusflavus* (5.55)was only isolated.



#### IV. Discussion

Onychomycosis is a chronic mycotic infection of fingernails and toe nails that affects the quality of life in a significant proportion. There has been a recent increase in the incidence as well as the spectrum of causative pathogens associated with Onychomycosis.

In the present study, 40% samples were positive by direct examination and/or culture. In studies which were conducted by Kaur et al., Das et al., Jesudanam et al., and Aghamirian et al., 54.5 %, 51.76%, 45.53% and 40.2% samples respectively were found to be positive by direct examination and/or culture [11-14].

In our study, 61.11% patients with onychomycosis were males and 38.88% were females, with a male female ratio of 1.57:1. Although many reports had shown a greater susceptibility of females to this infection [15,16], in our study, males were dominant. In the study which was conducted by Garg et al., and Veer et al., males were infected more than females [17,18]. 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 those in age group of 25-45 years (25.55%). Adhikari et al., also found a higher prevalence of onychomycosis in similar age groups [19]. In contrast, Velez et al., and Mercantini et al., reported higher prevalences among adults who were over 50 years of age [16,20]. The increased prevalence of onychomycosis at young ages could be because of occupation related trauma, cosmetic awareness and shoe wearing habits. In elderly, prevalence may be higher than what was observed, but as the disease is asymptomatic they are not mostly bothered about it.

In our study, the most common organisms which were isolated in culture were dermatophytes (83.3%), NDM (5.6%) and yeasts (11.1%). This finding was in accordance with those of many studies, which had demonstrated a greater prevalence of dermatophytes as the aetiological agents of onychomycosis [11, 14, 22] and it was in contrast to those of other studies which had found yeasts as the most common agents [23,24]. Among the dermatophytes, *T. rubrum* was the most common aetiological agent which was found in our study, followed by *T. mentagrophytes*. Although some studies had reported *T. mentagrophytes* as the most common dermatophyte [11], our finding was in concordance with those of many other studies which had found *T. rubrum* as the most common dermatophyte which was responsible for onychomycosis [15,18]. The increased prevalence of *T. rubrum* could have been due to increased virulence and better adaptation to hard keratin of nails. Among the NDM, *A. niger* was the commonest isolate which was obtained. Kaur et al., and Grover et al., also found *A. niger* to be the most common NDM which was responsible for onychomycosis [11,21]. *Candida albicans* accounts for a majority of cases of onychomycosis which are caused by yeast. *Candida papapsilosis*, *Candida tropicalis* and *Candida krusei* account for the remainder of the cases [25]. In our study, *Candida albicans* was isolated from 2 (11.1%) samples.

## V. Conclusion

In our study, dermatophytes were the most common aetiological agents of onychomycosis; the roles of NDM and yeasts in causing infections were also demonstrated. In our study, the combined sensitivity of direct microscopy and culture was greater than those of direct microscopy and culture alone. This emphasizes the need of performing both tests. In the present study, men were more commonly infected and the age group of 20-40 years was more commonly involved. Distolateral subungual onychomycosis was the common clinical pattern. The clinico-epidemiological data can be helpful for creating public awareness and for the development of diagnostic, preventive and treatment strategies.

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