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A RARE CASE OF FUNGAL ONYCHOMYCOSIS DUE TO SYNCEPHALASTRUM RACEMOSUM: AN EXPERIENCE FROM A TERTIARY CARE CENTER IN NORTH INDIA.

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ABSTRACT Onychomycosis is a non-dermatophytic (1%) fungal infections of the nail plates. Among the non-dermatophytes, Yeast like- C. albicans, C. tropicalis and moulds like- Scedosporium spp., Lomentospora spp., Cladosporium spp., Syncephalastrum spp., Quambalaria spp., Scopulariopsis spp., Scytalidium spp., fusarium spp. and Aspergillus spp. may be responsible for Onychomycosis. Here in, we report a case of total dystrophic onychomycosis caused by Syncephalastrum recemosum in a 47 year old male, who worked as laborer in waterworks plant and he was getting regular intermittent trauma to nails time to time. Syncephalastrum racemosum was isolated from nail clippings and scrapings on SDA and confirmed by KOH, calcoflour white , culture and LPCB wet mount. Patient got complete improvement given by oral therapy of terbinafine with combination of fluconazole as a pulse therapy for 6 months. This case is being reported due to the rarity of causative organism for onychomycosis with a novel approach in its treatment.

KEYWORDS : Onychomycosis, Syncephalastrum Racemosum, Pulse therapy.

INTRODUCTION

Fungal infection of skin and it's appendages (keratinized tissues like hair & nails) are due to dermatophytes which closely related to group keratinophilic fungi. Dermatophytes belong to three mycelial fungal genera ie. Trichophyton, Microsporum and Epidermophyton. They covers the 90% infections of skin and it's appendages. In addition to that except these genera some group of non-dermatophytes (yeast like fungi and filamentous fungi) causes same sites infections called dermatomycosis whereas hair infection known as piedra and nail infections as onychomycosis.

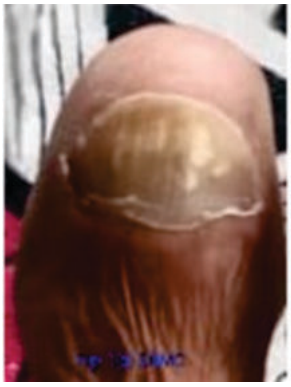
The term onychomycosis is derived from Greek word 'onyx'-nail and 'mykes'-fungus. It describes 99% dermatophytic infections and rest non-dermatophytic infections of nails. Non-dermatophytic infections are much less common that expands slowly and if left un-treated leads to complete destruction of the nail plate. Toe nails are more often affected than finger nails in a ratio 4:1 and it is difficult to treat them successfully.

Onychomycosis represents about 30% of all dermatophytic infections and 18-40% of all nail disorders [1]. It is less common among the children due to fast growing nails but significantly higher in population with risk factors like diabetes mellitus, systemic immunosuppression, old age, long term steroids, malignancy, broad spectrum antibiotics and trauma with vegetative matters for non-dermatophytic infections[2-5]. Mainly yeast (like C. albicans, C. tropicalis) and other moulds (like-Scedosporium spp., Lomentospora spp., Cladosporium spp., Paecilomyces spp., Syncephalastrum spp., Quambalaria spp., Scopulariopsis spp., Scytalidium spp., fusarium spp. and Aspergillus spp.) may be responsible.

Syncephalastrum racemosum is the most common infective agent for human in Syncephalastrum genera . This genera belongs to order mucorales of zygomycetes class [6]. It is saprophytic fungus found ubiquitously in air, soil and decaying plant debris [7]. It shows very low pathogenicity and considered as an uncommon human pathogens[8]. Here, we report a rare case of total dystrophic Onychomycosis caused by Syncephalastrum racemosum and its complete improvement with oral terbinafine combined with fluconazole as a pulse therapy for six month.

Case Study

A 47 year old male patient came to skin OPD at our center with discoloration and complete (total) dystrophy of all toes and finger nails with sparing of both little finger nails since last 4 years. He was working as laborer in waterworks plant and gave a history of continuous immersion of feet & hand in water with intermittent reinforcement trauma to nails. He had no significant medical history and other risk factors. He had taken only topical medication and oral anti-histaminics but he had worsening the condition without any improvement.



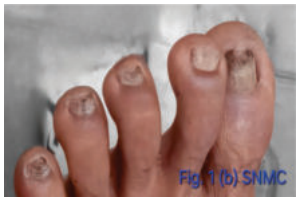


Figure-1 (a) **Figure-1 (b)**

Figure-1(a,b): Total dystrophic onychomycosis of left great toes with other nails dystrophy.

On examination, nails were totally dystrophic and brittle with yellowish-brownish discoloration, nail plate thickening and subungual hyperkeratosis(Figure-1(a,b). There was no sign of inflammation. The nails clippings and scrapings were collected from the affected part of nails and sent to microbiology for Potassium Hydroxide wet mount, calcoflour white staining, culture growth and Lactophenol cotton blue mount. Wet mount of 40% KOH and calcoflour white fluorescent microscopy showed wide, ribbon like, aseptate fungal hyphae (Figure-2). The nail clippings and scrapings were also innoculated in two different Sabouraud's dextrose agar (SDA) tubes, one with cycloheximide and second without cycloheximide then incubated at 37°C. Fungi grown well on SDA without cycloheximide within 72 hours. At first, this growth was cottony to wooly aerial mycelia with grayish white color then turned dark gray with black centre. And white or no change in obverse view of SDA culture [Figure: 3(a,b)]. but second tube containing SDA with cycloheximide had no

growth after 28 days. Lactophenol cotton blue (LPCB) mount showed wide, ribbon like, aseptate, branched fungal hyphae with sporangiophores and chains of spores formed within long, finger like tubular sporangia, called as merosporangia that projected from sporangiophores[18] (Figure-4 a,b). They lack phialides (this feature is helpful to differentiate this genus microscopically similar structure of Aspergillus genus).

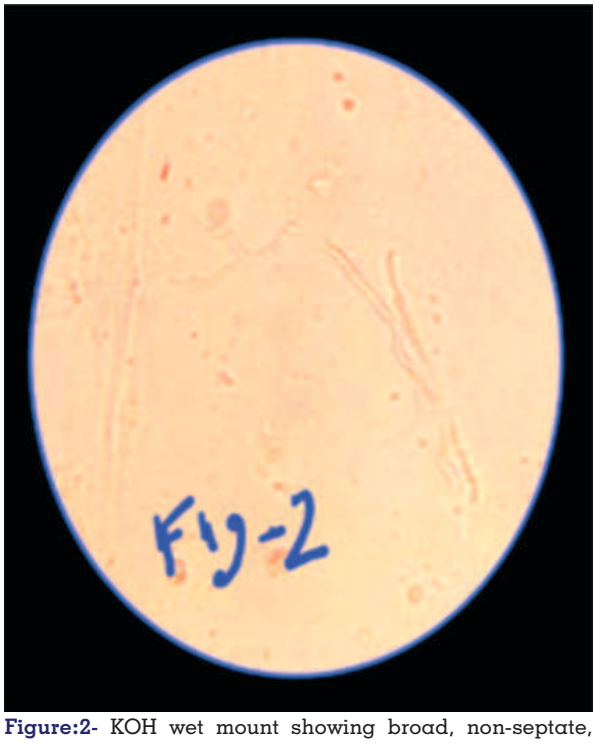


Figure:2- KOH wet mount showing broad, non-septate, ribbon-like hyphae with right angle branching and

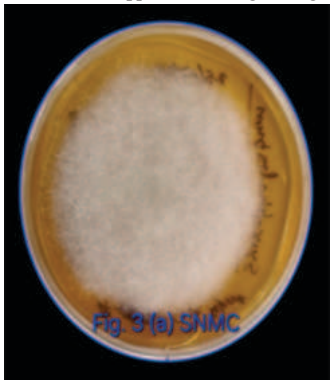
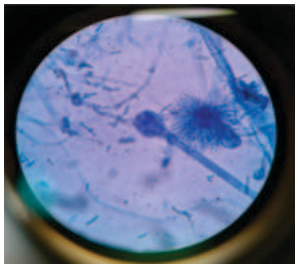


Figure: 3(a) Early Young Growth, Figure: 3(b) Old Growth
Figure:3- Grayish white cottony growth with black centre on SDA plate which turn to dark gray in later.



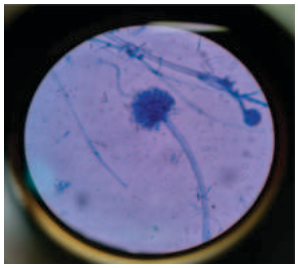


Figure 4 (a) Figure 4 (b)
Figure 4(a,b) : LPCB showing broad non-septate hyphae with finger-like merosporangia and globose/ovoid, smooth-walled sporangiospores (merospores).

Based on the above morphological characters, a diagnosis of onychomycosis due to Syncephalartrum racemosum was made and the patient was started on an oral combination of tab terbinafine (250 mg OD orally daily for 12 weeks) with Fluconazole as a pulse therapy (150 mg tab once a week for six months). The patient was followed-up for one year. There was complete improvement of the nails both clinically and mycological without any adverse effect.

DISCUSSION

The geography of North India covers the temperate climate zone with warm to hot summers and varying rainfall that peaks in the first few months of year. In recent years, North India has been subjected to both heavy rainfall and hot weather which may be a contributing factor to increased cases of non-dermatophytic onychomycosis [9]. In this environment, those who work with agriculture or have farming occupations are at risk of exposure to fungi [4,10].

Approx. 2% of total cases of onychomycosis is caused by non-dermatophytic moulds [1]. Mucorales have broad (10-15μm), ribbon like, aseptate hyphae with right angle branching, the hyphae are actually pauciseptate and the angle of hyphal branching lie between 45 to 90° [11]. Syncephalastrum species are more pathogenic to humans in non-dermatophytic onychomycosis. Syncephalastrum genera belongs to mucorales order of class zygomycetes [6]. These are found in ubiquitously in air, soil and decaying plant debris as colonizers[12] and rarely causes human infections [6-13]. Only four cases of onychomycosis due to S. racemosum reported previously [8,15,16] . The other published cases of S. racemosum are systemic infections.

Clinically, they are usually infect to skin and it's appendages [14,21] but rarely involve other sites like lungs [17], rhino-orbital-Cerebral infection [19] and intra abdominal infections [20]. Patients with combination of immunocompromised status and a fungal infection have a high risk of mortality. So early identification and early initiation of therapy is the main stay of improved clinical outcome.

In our case, the patient was probably suffering from persistent nail injuries from time to time from where he could have acquired the S. racemosum infection because trauma is most probable risk factor for onychomycosis.

Now a days Onychomycosis due to non-dermatophytic moulds are increasing[22]. Our case is diagnosed as a non-dermatophytic onychomycosis, which is caused by filamentous fungus Syncephalastrum racemosum. In Syncephalastrum racemosum onychomycosis, infections are not life threating but can cause significant discomfort to patient.

So, appropriate diagnosis and proper treatment is neccessary. For previously reported onychomycosis cases, patients were treated with debridement, topical antifungal and LASER treatment etc [8,14,15,16]. But in our case, patient was treated with orally combined therapy of terbinafine and fluconazole as a pulse therapy without any adverse effect/event and the nails improved completely in six months period of treatment.

CONCLUSIONS

Our case was diagnosed as onychomycosis as a result of Syncephalastrum racemosum fungal infection. Syncephalastrum infection is a very rare opportunistic infection, which is not reported before this at our center. In our case, a cost effective oral combination of terbinafine with fluconazole in a pulse therapy form is also effective as a novel treatment for onycomycosis without any side effect. But still mucormycosis is a therapeutic challenge because of the phylogenetic diversity, un-availability of any serological testing and invasive disease pattern.

So definite diagnosis with early management involve proper antimicrobial and/or antifungal treatment with or without successive surgical debridement also important for clinically and mycologically complete improvement.

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