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Onychomycosis in Egypt

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Nails may show morphological and pathological changes as a result of either congenital conditions or acquired local factors; as a manifestation of an associated skin disease; or as one feature of a systemic disorder. The diagnosis of a specific cause for a particular nail affection is sometimes very difficult even for the specialist and thorough clinical examination and investigative studies are often required before the diagnosis can be labelled.

We have frequently noticed that, cases referred to our department by general practitioners or even by Skin Diseases Clinics, diagnosed as fungus infection of nails are not genuine cases of onychomycosis. The diagnosis in such cases is usually based on clinical grounds alone and griseofulvin is prescribed liberally but with no effect.

Therefore during the last two years we have attempted to investigate all the cases diagnosed as onychomycosis whether referred to the Skin Department at Ain Shams University Hospitals already diagnosed or attending the outpatient clinic on their own because of nail trouble. It was our aim to study the role of fungi as a cause of nail disease and to identify the causative organisms responsible for onychomycosis in Egyptian patients.

Materials and methods

316 patients were examined, 177 suffered from onychia and 139 from both onychia and paronychia. Each patient was examined by two of us at least. Scrapings were obtained from the affected nails and adjacent skin and inoculated onto the surface of Sabouraud agar with chloramphenicol and actidione, Sabouraud agar without actidione and on blood agar. A complete case history was registered for each patient regarding age, sex, occupation, duration of disease and number of fingers affected. All patients giving history of recent therapy (6 months to one year) by griseofulvin were excluded from the series.

Results

316 cases have been examined in this series, 291 were females (92%), the remaining 25 were males (8%). The clinical diagnosis was onychia in 177 cases (56%) and onychia associated with paronychia in 139 cases (44%).

Analysis of the results are shown in the following series of Tables.

Table I: Age Incidence

Age	No. of cases
Less than 10 years	2
From 11—20 "	74
" 21—30 "	127
" 31—40 "	66
" 41—50 "	34
More than 50 "	13

Table II: No. of Nails Affected

Total No. of nails affected	976
Average No. of nails affected per person	3
Minimum No. of nails affected per person	1
Maximum No. of nails affected per person	10

Table III: Occupation

Occupation	No.	%
Housewives	251	79.4
Servants	28	8.7
Cooks	5	1.9
Students	16	5.0
Other occupations	16	5.0

Table IV: Duration of the Disease

Years	No.	%
Less than one year	141	44.6
From 1— 5 years	130	41.0
„ 6—10 „	40	12.5
More than 10 years	5	1.9

Table V: The Fungal Flora of Diseased Nails

Type of organism	No.	%
Dermatophytes	2	0.7
Yeasts	144	45.6
Moulds	43	13.6
Bacteria	79	25
Yeasts + Bacteria	6	1.8
Negative	42	13.3

Discussion

Two important clinical observations are clearly noticed in our series of 316 patients with suspected fungus infection of nails: first, the predominant affection of the female sex (92%), and, second, the high incidence among housewives (79.4%). Nearly half the cases sought medical advice during the first year of affection and the number of finger nails affected increased with the chronicity of the condition and negligence of treatment.

The role of dermatophytes as a cause of nail disease was surprisingly poor in our cases (0.7%). Two species were only isolated, namely *Trichophyton mentagrophytes* and *Trichophyton tonsurans*. On the other hand, yeasts (*Candida albicans* and other yeasts) were isolated from 45.6% of cases.

The high incidence in the female sex and the important role of yeasts as a cause of onychomycosis was recently verified by BLASCHKE-HELLMESSEN (1968) in Germany who gave a report on 1400 patients and found that 65% of her cases were females and that

Table VI: Different Dermatophytes, Yeasts, Moulds and Bacteria Isolated from Nails

Type of Organism	Total No.	Species	No.
Dermatophytes	2	Trichophyton mentagrophytes	1
		Trichophyton tonsurans	1
Yeasts	144	Candida albicans	29
		Other yeasts	115
Moulds	43	Aspergillus	20
		Penicillium	8
		Rhizopus	3
		Scopulariopsis	3
		Helminthosporium	1
		Trichothecium	1
		Mucor	1
		Unidentified	5
		Bacteria	79
		Streptococci	4
		Anthracoid	5
		Staphylococci + Anthracoid	11

yeasts were incriminated in 35.7% of cases. However, dermatophytes were at the top of the list and constituted 68.6% of the isolated fungi. *Trichophyton rubrum* was the most common cause, followed by *T. mentagrophytes*, *T. terrestre*, *T. tonsurans*, *T. quinckeanum*, *T. verrucosum*, *T. megninii*, and *Epidermophyton floccosum*.

The important role of *T. rubrum* and *T. mentagrophytes* has also been emphasised by many authors from different parts of the world (CREMER, 1957; LANGER, 1957; WALSH and ENGLISH, 1966 and RIETH, 1967).

In our series, dermatophytes proved to play a minor role in nail affection, and at the same time we failed to isolate *T. rubrum* in any of our cases, although many of the patients were subjected to repeated cultural examination and the inoculated media were not rejected before at least 4 weeks.

Affection of nails by yeasts was described by ALKIEWICZ in 1957. In 1968 BLASCHKE-HELLMESSEN found that the fungal flora of nails were overwhelmed by yeasts particularly in females. WALSH and ENGLISH (1966) found a high incidence of *Candida* infections (124 cases out of 373) especially in finger nails and most of the cases were accompanied by paronychia. According to RIETH (1967) the pathogenicity of yeasts for nails is now accepted, not only for *Candida albicans* but also for other types of *Candida* as for example, *C. parapsilosis*. In the last years emphasis has been placed on the role of *Candida* found beneath the nail fold (MARTEN, 1959).

Onychia and paronychia caused by *Candida albicans* and other types of yeasts represent the highest number of cases of nail affection among our patients (45.6%) and it is evident that the highest incidence is among housewives (79.4%). It seems that such variation in sex incidence is not due to hormonal influences or structural differences between the nails in both sexes but is mainly due to differences in habits and nature of duties and jobs each sex is concerned with. Most of our patients in the series belong to the poorer class of the society, usually with a good number of children and this, naturally, necessitates manual cloth washing and much home and kitchen work. Frequent exposure to trauma and prolonged exposure to water would definitely help access of microorganisms to the soddened skin and macerated tissues around the nails. The effect of constant exposure

to moisture as a predisposing cause for onychia and paronychia was also previously reported by CONANT et al. (1954); FRAIN-BELL (1957); WHITTLE et al. (1959); EMMONS et al. (1963) and SHRANK et al. (1965). Furthermore, it has been realised that healing of both onychia and paronychia, would only take place if the nail fold is protected from immersion in water, although specific treatment is also advocated (SAMMAN, 1961).

Moulds were repeatedly isolated in 13.6% of our cases. These included *Aspergillus*, *Penicillium*, *Rhizopus*, *Scopulariopsis*, *Trichothecium* and *Mucor*. Similar results were also shown by WALSH and ENGLISH (1966) who isolated mainly *Scopulariopsis brevicaulis* and many species of *Aspergillus* and sporadic cases of *Cephalosporium*, *Fusarium*, *Penicillium* and *Pseudeurotium ovalis*. Infection of nails by nondermatophytes were also recorded by previous authors (NEGRONI, 1940; BERESTON and KEIL, 1941; BERESTON and WARING, 1946; MOORE and WEISS, 1948; PEREIRO MIGUENS, 1951; GRIMMER, 1954).

According to the results presented in this work, though it only represents patients drained from the Eastern part of Cairo, we can conclude that infection of nails by dermatophytes does not conform an important role in onychomycosis among Egyptians and that Griseofulvin is frequently wrongly prescribed, while, on the other hand, yeasts proved to be the common organism in cases of onychia and/or paronychia. However, it is not possible to say that, the yeasts isolated are responsible for the disease. On the other hand, their presence especially on such skin with lowered local resistance, e. g. macerated due to excessive humidity, is not wanted, as they may aggravate the condition irrespective of their pathogenic character. Therefore, it was very successful in our cases to advise them to avoid water as possible and apply antibacterial and anti-yeast medicaments to get rid such organisms and to give chance for the inflammation to subside. In such cases Griseofulvin has no effect.

However, we would rather prefer to study more cases than those included in this work and to get samples from different parts of the country and to study nails of patients who do not frequently expose their hands to moisture before we consider the figures given are conclusive.

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