CLINICAL CHARACTERISTICS AND MYCOLOGY OF CUTANEOUS CANDIDIASIS IN AHWAZ (IRAN)

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ABSTRACT:

Objective: To study clinical characteristics and mycology of cutaneous candidiasis in Ahwaz (Iran).

Design: Four hundered sixty one patients were examined for cutaneous candidiasis over a period of 4 years from different medical mycology laboratories in Ahwaz.

Patients and Methods: Skin scrapings, nail clippings and swabs were obtained from the lesions of 461 subjects. Samples were prepared by KOH, Gram and methylene blue techniques. The samples were also cultured on Sabouraud's dextrose agar with chloramphenicol (SC) and kept at 37°C for one week. Isolates were identified based on germ tube test, production chlamydoconidia in cornmeal agar, growing at 45°C and API 20 C AUX kits.

Results: 257 patients 179 female and 78 male (55.7%) were observed to have candidiasis. Onychomycosis (64.2%) was the most common form of candidiasis, followed by groin candidiasis 21% and toenail candidiasis (14.8%). *Candida albicans* (49.4%) was most common isolate from patients.

Conclusion: Cutaneous candidiasis is an important candida infection in women at the ages of 21-40 years in Ahwaz and *C. albicans* is the commonest etiologic agent.

KEY WORDS: *Candida albicans*, Candidiasis, Cutaneous candidiasis, Onychomycosis, Candida Spp.

Pak J Med Sci January-March 2006 Vol. 22 No. 1 43-46

INTRODUCTION

Cutaneous candidiasis is secondary yeast infection that occurs as a sub-acute or chronic infection.[1] Accordingly, candidiasis is a disease of the diseased.[2] It may involve almost any skin surface on the body. Disease involvement may be localised or generalised to the skin or nails. The spectrum of cutaneous candidiasis includes; diaper rash, intertrigo candidiasis, candida folliculitis, otomycosis, onychia and paronychia and occurs when these areas become macerated.[3] Cutaneous candidiasis usually occurs in warm, moist and creased area, such as axillary folds, inguinal or intergluteal areas. Cutaneous candidiasis is fairly common opportunistic disease and is usually caused due to maceration and trauma in skin.[4,5] Cutaneous candidiasis is particularly common in individual with diabetes and in people who are obese. Other predisposing factors are antibiotic and oral contraceptives.

Candida onychomycosis is one of the most prevalent clinical forms of cutaneous candidiasis and has worldwide distribution.[6-10] Candida paronychia is a chronic and inflammatory infection of nail folds. Typically, the redness, inflammation, pain and swelling of the paronychial tissues are characteristics of paronychial candidiasis. Candida onychia is a chronic infection of nail plate that is characterized by brownish or greenish discoloration, of lateral borders and erosion of the nails.[10] Hardness, thickness and white to brown colour of nails are the other symptoms of onychia. Onychomycosis is an opportunistic disease and is usually caused due to impaired protective functions in healthy individuals; for example, maceration or trauma in nails. Candida onychomycosis is usually seen more often in

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* Received for Publication: March 14, 2005
Revision Received: July 16, 2005
Revision Accepted: September 16, 2005

females than males.[11] The aim of this study was to define clinical characteristics and mycology of cutaneous candidiasis in Ahwaz (Iran).

PATIENTS AND METHODS

In this study 461 patients were examined for cutaneous candidiasis. Individuals who were currently receiving antifungal agents for at least 3 days before the mycological examination were excluded from the study.

Sampling: Skin scrapings were used for the sampling of cutaneous candidiasis by scraping the edges of the lesions and swabs were taken from discharge materials. Toenail and fingernail clipping were collected from all subjects whose nails appeared dystrophic. All samples were examined immediately.

Direct and culture examinations: Direct examination of specimens (skin scrapings, nail clippings) was carried out using KOH (20%), KOH/Parker Ink and KOH/DMSO (dimethyl sulphoxide). In addition, microscopic slides, prepared from swabs were stained by methylene blue and Gram techniques. Pseudohyphae, germ tubes, yeast and budding cells were the morphological forms of Candida species that were detected in clinical materials. The detection of pseudohyphae in skin and nail scrapings is more significant. All clinical materials (skin scrapings, nail clippings and swabs) were cultured on SC (Difco, East Molesey, UK) plates or slant tubes. All cultured media were incubated at 30-37°C for 1 week aerobically and checked daily.

Identification of yeasts: Isolates were initially identified by microscopic examination of yeast colonies. Identity was confirmed by the germ-tube test, production of chlamydoconidia on Corn meal agar, growth at 45°C and API 20C AUX (BioMerieux SA, Marcy-L'Etoile, France).

RESULTS

Four hundred and sixty one subjects were investigated in the present study. The age range of patients was from one month to 51 years with a mean age of 25.5 years. A total 257 (55.7%) of study subjects were positive for candidiasis in direct smear and culture. These were 179 (69.6%) females and 78 (30.4%) males. In our study, onychomycosis was predominant form of candidiasis in 165 (64.2%) patients followed by groin candidiasis 54 (21%) and toenail candidiasis 38 (14.8%). *C. albicans* was the frequent candida isolated from patients, 117 (49.4%). *C. tropicalis*, 65 (27.4%) and *C. parapsilosis* 23 (9.6%) were the next most frequent isolates. Other yeasts were *C. krusei*, 6 (2.5%), *C. guilliermondii* 5 (2.1%), *C. pseudotropicalis* 4 (1.7%), *C. humicola* 3 (1.3 %) and *C. lipolytica* 1 (0.4%). Unidentified yeasts were 14 (5.9%). The details of different clinical types of candidiasis as follow.

Onychomycosis: One hundred and sixty five (64.2%) of the 257 patients with candida infection had candida onychomycosis (onychia and paronychia). The details of sex and age of patients are shown in Fig-I. Majority of patients (58%) in both sexes were in the age range of 21-40 years. Candida onychomycosis was predominant in females (140, 84.8%) than in males (25, 15.2%). 95.8% patients had onychomycosis of fingernails (81.2% in females, 14.6% in males) and only 4.2% (3.6% in females, 0.6% in males) had both fingernails and toenails infection. However, the frequency of infection was more in females than males. The frequency of onychia was higher (67.3%) than paronychia (32.7%). The duration of infection was 1 to 36 months with majority (54.6%) being up to 12 months. Onychomycosis was prevalent in women, mostly housewives 99 (60%), followed by children (under 6 year), students, staffs and others (Table-I). The predisposing factors included; diabetes, antibiotics therapy and corticosteroid therapy, trauma and finger

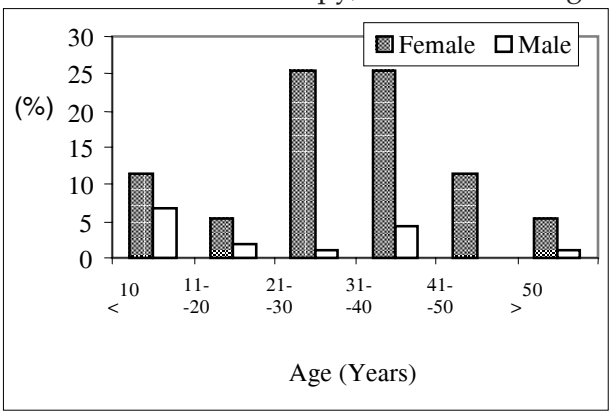

Fig-I: Age distribution of patients with onychomycosis.

Table-I: Frequency of candida onychomycosis in patients.

	Housewives	*Children*	*Students*	*Staffs*	*Miscellaneous*	*Total*
Female	99 (60%)	15 (9.1%)	14 (8.4%)	12 (7.3%)	0 (0%)	140 (84.8%)
Male	0 (0%)	9 (5.5%)	6 (3.7%)	5 (3%)	5 (3%)	25 (15.2%)
Total	99 (60%)	24 (14.6%)	20 (12.1%)	17 (10.3%)	5 (3%)	165 (100%)

sucking. Candida was detected by direct smear in 18 (10.9%), by repeated culture in 10 (6.1%) and by both methods in 137 (83%). *C. tropicalis* was the predominant yeast isolated from samples in this study, 63 (42.9%). *C. albicans* and *C. parapsilosis* were the next most frequent isolates, 36 (24.5%) and 18 (12.2%), respectively. Other yeasts less commonly detected were *C. krusei*, 6 (4.1%), *C. guilliermondii* 4 (2.7%), *C. pseudotropicalis* 4 (2.7%), *C. humicola* 3 (2 %) and *C. lipolytica* 1 (0.7%). Unidentified yeasts were 12 (8.2%).

Groin candidiasis: 54 patients out of 257 (21%) had candida intertrigo of groin. 74% (40) and 26% (14) of patients were respectively male and female. The most common etiologic agent was C. albicans (94.4%) followed by *"C. parapsilosis"* (3.7%) and *"C. tropicalis"* (1.8%).

Toenail candidiasis: 38 patients out of 257 (14.8%) had toenail candidiasis, 34.2% were males and 65.8% females. The incidence of disease was more in female in the range of less than 20 years and >41, whereas this frequency was considerably increased in males in the range of 21-40 years. Mycological examinations revealed *C. albicans* in 30 patients (78.9%), followed by *C. parapsilosis* (7.9%), *C. tropicalis* (5.3%), Candida species (5.3.%) and *C. guilliermondii* (2.6%).

DISCUSSION

Cutaneous candidiasis is usually secondary infection of skin and nail (body folds) in predisposed patients. The incidence of candidiasis has increased in recent years, especially in immunocompromised, diabetes, renal transplant, long term administration of corticosteroids and antibiotics.[12,13] Candida onychomycosis was more predominant in females than males whereas groin candidiasis was more prevalent in man. In this study the frequent age range of patients in both sexes was 21-40 years that confirmed the findings of earlier studies in Iran.[14]

Candida onychomycosis is a common clinical form of cutaneous candidiasis and the incidence of disease has increased during the past decade.[9] The frequency of candida onychomycosis in our study which was predominant in females was similar to that reported by other investigators in Iran.[9,11,15] The prevalence of onychomycosis among the women in our study and in the other studies conducted in different areas in Iran reflects the significance of the disease among Iranian women and could be attributed to theirs life styles. A higher incidence of candida onychomycosis of the fingernails (95.8%) was observed in women. These results agree with Khosravi and Mansouri [11] and Moghaddami and Shidfar[9] in Tehran and Bokhari *et al*.[6] in Pakistan. Higher frequency of candida onychomycosis in Iranian housewives may be due to continued immersion of fingernails in water, for example, hand washing. The main predisposing factors for the disease are water immersion and mechanical trauma.[4,10]

The highest prevalence of onychomycosis in present study was found in patients between 21-40 years of age. Moghaddami and Shidfar reported candida onychomycosis in the age groups of 0-5 and 24-29 years.[9] Onychomycosis in children is relatively uncommon, with a prevalence of approximately 0.3% worldwide.[16] However, in present study children were the second group who involved by onychomycosis (14.6%). Candida onychomycosis is probably the most common nail disease in adults.[17] Candida onychomycosis is a chronic infection of one, two or all nails with duration of many months. In this study the period of infection in the most of patients (45.4%) was between 1-6 months and only in 10.3% of patients was less than 1 month.

The prevalence of groin candidiasis among the men in our study and in the other studies conducted in Iran[15] reflects the significance of the disease. The age and sex distribution of subjects

involved in this study were similar to those in previous studies of patients with candidiasis.[15] However Yazdanfar *et al*. reported that cutaneous candidiasis is more prevalent in women.[14] The maceration leads to traumatic skin lesions with loss of the protective keratin barrier of the epidermis. On occluded sites of bodies, such as groin, spaces between toes candida infection can occur.[1] In our study several predisposing factors were noted including; obesity, diabetes, corticosteroid and antibiotic therapy, occlusion and maceration. Small, flat, erythematous satellite lesions provide an additional clue to the diagnosis of candidiasis. In this study toenail candidiasis was more prevalent in both sexes at the age of 20-40. Toenail candidiasis usually occurs in housewives and dishwasher.[5]

Candidiasis can routinely be identified with the benefit of microscopy or culture and in many cases. In contrast to dermatophytes, culture of yeasts from nails is easy and usually grows on mycological media during 24-48 hours at 37°C. In our study 91.1% of samples yielded yeasts species and 8.9% of samples were only positive in direct smears. Affected areas are mainly the mucosa where *C. albicans* is normally present in health, and on regions of moist skin. *C. albicans* was accounted for 49.9% of the groin candidiasis in Netherlands.[18] *C. albicans* is the most pathogenic candida species as a result and it is the most important etiologic agent of candidiasis. In our study we found that onychomycosis was mostly caused by *C. tropicalis* (42.9%), followed by *C. albicans* (24.5%) and *C. parapsilosis* 17 (12.2%). However, other investigators reported *C. albicans* and *C. parapsilosis* as the most predominant species of onychomycosis in Tehran.[9,11] Also Velez *et al*. believed that the commonest candida causing onychomycosis in Spain are *C. albicans* and *C. parapsilosis*.[8]

CONCLUSION

There is still little data available about the epidemiology of candidiasis in Iran; however, based on the present study we conclude that candidiasis is a disease of considerable importance in Ahwaz and *C. albicans* and *C. tropicalis* are respectively are the main etiologic agents. In conclusion, cutaneous candidiasis accounted for 55.7% of examined patients. Onychomycosis and groin candidiasis were respectively more important in women and men at the ages of 21-40 years in Ahwaz (Iran).

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