The Rate of Cutaneous Candidiasis in Patients with Skin Mycoses in Baquba / Diyala Province- Iraq

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Abstract:

Objectives: The present study aimed to determine the prevalence of cutaneous candidiasis among patients with skin mycoses in Baquba, the center of Diyala province.

Patients and methods: During the period from October/2003 to July/2005, a total of 972 specimens (skin scrapping and/or nail) were collected from patients attending the out-patient clinic for dermatology and venereal diseases in Baquba General Hospital. Direct microscopical examination and culture were done for specimens. Identification of candida species based on standard cultural and biochemical criteria. All data were statistically analyzed.

Results: The results revealed that 753 (77.5%) patients were clinically and laboratory confirmed as having skin mycoses, 197(26.2%) of them have cutaneous candidiasis. The prevalence of candida infection was significantly higher in folded skin compared to other body sites and in females compared to males (64.8% *vs* 35.2%).Additionally, the highest rate was recorded in 12-21 years age group, and there was insignificant difference in the infection rate regarding the residence. Similarly, there was insignificant association between candida species and site of infection.

Conclusion: Cutaneous candidiasis constitute about one quarter of skin mycoses infections in Diyala province, Iraq.

Key words: Skin mycoses, cutaneous candidiasis, Diyala.

Introduction

Candida fungal infection usually confined to the superficial layers of the skin or mucous membranes, that present clinically as oral thrush, intertrigo, vulvovaginitis, paronychia or onychomycosis[1]. Oral and skin (diaper rash) candidiasis is common in infants under 6 months of age [2]. Several species of the genus candida are capable of causing candidiasis. Transmission occurs through contact with secretion or excretion of mouth, skin, vagina and feces, from patients or carriers, by passage from mother to neonate during childbearing and by endogenous spread [3].

Candida albicans is often part of the normal flora of the human skin, mucous membranes and gastrointestinal tract [4]. Clinical disease occurs when host defenses are impaired. Local factors contributing to superficial candidiasis include interdigital intertrigo and paronychia on hands with excessive water exposure and intertrigo in moist skin folds of obese individuals [5]. Prominent among systemic factors predisposing to superficial candidiasis are diabetes mellitus, administration of broad-spectrum antibiotics or immunosuppressive agents, renal transplantation and HIV infection [6,7]. Women in the third trimester of pregnancy are prone to vulvovaginal candidiasis [8].

Materials & Methods

During the period from October/2003 to July/2005, a total of 972 specimens (skin scrapping and nail) were collected from patients attending the out-patient clinic of dermatology and venereal diseases in Baquba General Hospital. All specimens were microscopically examined by direct mount with 10% potassium hydroxide and lactophenol blue stain. Cultures of specimens were done on Sabouraurd's dextrose agar and Potato dextrose agar. Identification of candida species based on colonial morphology, chlamydospore formation by subculture on corn meal agar, formation of germ tube and other biochemical criteria. All data were statistically analyzed.

Results

The results revealed that 197 out of 753 patients with skin mycoses (26.2%) had cutaneous candidiasis. The distribution of infection according to the body sites showed that the infection rate was significantly higher in folded skin sites as compared to other sites in the body, table (1).

Regarding the relationship between site of infection and sex. Generally, the overall infection rate in females (64.5 %) was significantly higher than that in males (35.5 %), table (2).

Table (1): Distribution of cutaneous candidiasis according to body sites.

Site of infection	No. infected	%	Total (%)
Skin folds			
Interdigital	58	29.4	
Interfinger	41	20.8	
Thighs	18	9.3	124 (62.9)
Axillary	7	3.5	
Nails			
Finger nails	40	20.3	62 (31.5)
Toe nails	22	11.2	
Scrotum	11	5.6	11 (5.6)

P< 0.05 [S]

Table (2): Infection rate according to sex.

Site of infection	No. infected	
	Males	Females
Skin folds		
Toe webs	8	48
Finger webs	10	30
Thighs	18	0
Axillary	8	0
Nails		
Finger nails	10	30
Toe nails	8	15
Scrotum	8	4
Total (%)	70 (35.5)	127 (64.5)

P <0.05 [S]

The distribution of infection according to the age groups showed insignificant differences (P> 0.05) although the highest infection rate was recorded in the age group (12-21) years old compared to other age groups, table (3).

Concerning the infection rate by cutaneous candidiasis according to the residence, the results showed that although the infection rate was higher in urban areas compared to rural areas (55.8% *vs* 44.2%), the difference between the two groups was statistically insignificant, table (4).

Isolation and identification of candida species using cultural characteristics and biochemical criteria revealed that 48 (88.3%) were *candida albicans* and 6 (11.7%) were *candida tropicalis*. Regarding the relationship of candida species and the site of infection, the results revealed that there was no significant association, table (5).

Table (3): Infection rate according to age groups.

Age groups (ys)	No. infected	%
1-11	18	9.1
12-21	80	40.6
22-31	44	22.3
32-41	15	7.6
42-51	22	11.2
52-61	18	9.1

P >0.05 [NS]

Table (4): infection rate according to residence.

Residence	No. infected	%
Urban	110	55.8
Rural	87	44.2
Total	197	26.2

P > 0.05 [NS}

Table (5): Candida species according to site of infection

Site of infection	*C. albicans*	*C. tropicalis*	Total (%)
Skin folds	104	20	124 (62.9)
Nails	62	0	62 (31.5)
Secrotum	8	3	11 (5.6)
Total (%)	174 (88.3)	23 (11.7)	197 (26.2)

Discussion

Cutaneous candidiasis caused by yeasts that normally colonize superficial skin folds, mucous membranes and gastrointestinal tract. However, these yeasts may become opportunistic pathogen under certain circumstances including immune deficiency as a result of malignancies, immunosuppressive therapy, chronic metabolic disorder such as diabetes mellitus, and administration of broad spectrum antibiotics [1,9].

The overall rate obtained in the present study was 26.2% which is in agreement with those reported by other studies; 27.6% in Babylon [10], and relatively higher than 10% reported by [11] in Libya, and 17% in Italy [12].

The predominant site of infection in this study was the skin folds (62.9%), nails (31.5%) and diaper area in infants (5.6%). These results were consistent with those reported by Mohammad (2000) [10], who found that cutaneous candidiasis is common in skin folds (75.8%) followed by nails (18.1%) and diaper area (4.5%).The predominance of cutaneous candidiasis in skin folds such as axillary, interdigital, inframammary glands areas seems not unusual, since these areas provide suitable environment e.g. humidity and warmth for the growth of candida [9].

The significantly higher infection by cutaneous candidiasis in females compared to males in the present study was consistent with those reported by Ellabid and Khalifa (2001) [11] in Libya. This probably due to exposure of female hands to longer periods of humidity during homework including; washing of clothes and dishes [13]. Furthermore, females frequently use acetone as nail polish removal beside exposure to other chemicals such as detergents cracks the superficial layer of nails predisposing them for candida infection [4].

The results also revealed that the highest infection rate was among those with 12-31 years old. This probably related to the work style of those people and frequently exposed to water and detergents [5].

The present study also documents that the majority of cutaneous candidiasis was due to *C.albicans* compared to other species. These finding was in agreement with those reported by Mahmmud (2000) [10] in Babylon, and Ellabid and khalifa (2001) [11] in Libya. These results are not unusual since *C. albicans* forming the majority (40-80%) of all candida species I human body [14].

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