

Epidemiology of Cutaneous Candidiasis among Patients Attending Tikrit Teaching Hospital

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Abstract

Background:

Cutaneous candidiasis is a term of infection by candida yeast. it involves skin in anywhere of the body, but most often occurs in warm, moist, creased areas such as under breast in women , buttock region in babies, armpits , groins and between fingers. Cutaneous candidiasis are more common in newborn and elderly. Risk of infection occur in people who are diabetic mellitus, antibiotics use, steroid treatment & chemotherapy.

Material &methods

A cross sectional study was conducted at dermatological outpatient in Tikrit Teaching Hospital during a period from 1st September 2015 to 1st of January 2016. The number of patients attending the outpatient clinic during this period were sixty five, of them 16 patient included in this study had superficial candidiasis. Presumptive diagnosis is made during clinical examination, while a definite diagnosis is obtained by scraping the site of the rash swabs then obtaining material for microscopic examination and culture.

Results

37.5% of patient with candidiasis were males and 62.5% were females. Intertrigo was the most form of cutaneous candidiasis found in 37.5% followed by napkin rash (31.2%). diabetic and children under five years found to be the common predisposing factors.

Recommendations:

Good skin care is essential for dealing fungal infections in diabetes and children, skin should be kept clean and dry, especially the skin folds areas.

Key words: Cutaneous Candidiasis , intertrigo, napkin rash .

Introduction

Candida is part of normal body flora of the oral cavity, gastrointestinal tract and it is also commonly found on the skin (Murray et al, 2013). It thrives in warm, moist conditions (Goldstein et al, 2000) , exists in oval yeast like forms, up to 5 µm in diameter, and

produces pseudohyphae and hyphae (Gow, 1997).

When the normal balance of flora is disturbed, an acute infection may occur (Robinson 2012). Risk factors include antibiotics, corticosteroids, diabetes, elderly, obesity, immunosuppression, and

immunodeficiency. (Goldstein et al, 2000; Robinson 2012).

Cutaneous candidiasis is superficial infections of skin, nails, inter digital space and mucus membranes caused by the yeast *Candida*, especially *C. albicans* (Cruz et al , 2011) , it tends to arise at the folds of the body especially where the area is warm and moist (Male , 1990).

The groin region, feet, armpits, under the breast in women and the buttock region in babies (diaper dermatitis), corner of the mouth are more common sites (Kauffman ,2011).

Skin candidiasis can affect any person at any age but it often tends to be more common in newborns and elderly. It is also more commonly associated with lower immune system individuals and with antibiotic use. (Gow , 1997; Varade & Burkemper,2013)

Candida skin infections may presented as intertrigo, diaper dermatitis, erosio inter digitalis blastomycetica, perianal dermatitis, and candidal balanitis (Dabas, 2013) with variety of symptoms appears such as intense itching, red growing skin rash on the skin folds, genitals, middle of the body, buttocks, under the breasts, and other areas of skin (Kauffman , 2011; Edwards, 2014)

Environmental and lifestyle factors include living in warm humid areas, poor hygiene, and infrequent diaper changes in

babies, tight clothing may cause chaffing and excessive sweating and enhanced infections (Foureur et al , 2006).

Prevalence of candida skin infections have increased in the recent years, principally because of the increased numbers of patients who are immune-compromised. Kauffman , 2011).

Candida of the skin usually is not contagious. However, people with weak immune system may develop the condition after touching the skin of the infected person. (Jain et al , 2010)

The virulence of *C.albicans* arises from the synergistic actions of several aggressive mechanisms (Calderoni & Fonzi , 2001 ; D'Eça et al , 2011) such as the high production capacity of host tissue degrading exoenzymes proteinase and phospholipase, morphological dimorphism and phenotypic switching. These mechanisms could altered the adherence to epithelial cells, susceptibility to antifungals, fungicidal activity of neutrophils and production of toxins , accompanied by weakness of the host immune response (Tamura et al , 2007; Ribeiro et al , 2010; De Rossi et al , 2011; Sardi et al , 2012)

Aim:

Study the epidemiology of cutaneous candidiasis among patients attending out patients' clinic in Tikrit Teaching Hospital.

Materials & Methods

Selection of sixteen patient with cutaneous candidiasis from the total Sixty five having skin infection of different clinical presentations with age ranging between 1week- 65years from dermatological outpatient clinic in Tikrit Teaching Hospital during a period from 1st September 2015 to 1st of January 2016.

Careful history taking regarding chronic illness as diabetic, renal and vascular disease, using of antibiotic, steroid therapy and immunosuppressive medications.

Physical examination by the specialist were done then swab is used to collect samples from patients under aseptic technique by using 70% ethyl alcohol, put in nutrient broth and transferred to the laboratory for further investigations to identify bacterial etiologies while those infections suspected to be of fungal etiology, skin scraping of the lesion is done.

Gram stain: yeasts are mostly gram +ve (Picard, 2011).

Lactophenol cotton blue for quick evaluation of fungal structure. Yeast cells can be seen divided by budding, pseudohyphae (branched filaments similar to those of dermatophytes) (Picard, 2011).

Fungal culture done by:

Sabouraud dextrose agar (SDA):

composed of dextrose that provides an energy source, and peptone which provides nitrogenous compounds. Addition of antibiotics like Chloramphenicol and/or tetracycline acts as broad spectrum antimicrobials to inhibit the growth of a wide range of gram-positive and gram-negative bacteria. Incubation temperature is 30 or 37°C. for 24-48 hours.

Yeast culture appears smooth, creamy, viscous, or pasty in appearance (Hare, 2013).

Potato dextrose agar (PDA):-

This is suitable for culture of *C.albicans*, used for stimulation of sporulation with added tartaric acid to inhibit bacterial growth (1.4g to 39g PDA in 1000ml DW.) (Murray *et al*, 1995).

Corn meal agar (CMA):-

Stimulates sporulation of *C. albicans*, and is useful in suppressing certain other fungal growth (Baron& Finegold,1990). Chlamydospore production is an important diagnostic characteristic used in the identification of *C. albicans* (Duncan& Floeder, 1963). Kelly and Funigeillo⁴ reported that the addition of 1% Tween 80 enhanced chlamydospore formation by *C. albicans* (Kelly& Funigeillo, 1959).

Germ tube differentiation test: - (Menezes *et al*, 2013)

*Put 0.5 ml of human or animal serum in a small test tube.

* Small portion of yeast colony was emulsified to be tested in the serum.

*Incubate at 37⁰C for 3 hours in an incubator.

*remove a drop of serum to a slide, cover slip and examine under 40x. light microscope. Germ tube is a small filament projecting from blastoconidia without any constriction at the parent cell.

Chrome agar candida medium:

This is a selective and differential medium with the inclusion of chromogenic substrates producing different colors. Colonies of *Candida albicans* appear light to medium green (Odds & Bernaerts, 1994).

Proteinase and phospholipase enzyme production: -

These are manifested by clear zone of precipitate around colonial growth on Proteinase and phospholipase media respectively (Aher, 2014).

Result

After excluding patient with bacterial infections and dermatophytes the total number of patients with cutaneous candidiasis were sixteen, percentage of males with cutaneous candidiasis was (37.5) while in female was (62.5).

Intertrigo was the most form of cutaneous candidiasis that represent 37.5%

of the sample followed by napkin rash (31.2%), then corner of the mouth (18.8%) and the least (12.5%) for inter digital and nail infection as shown in Figure (1).

As the percentage of female infected with cutaneous candidiasis more than male, intertrigo showed to be double in female than male (25% versus 12.5) as well as nail infection found to be in female only. Table (1)

Table (2) reveals that the common predisposing factors among those with cutaneous candidiasis was diabetic patients which found to be 43.7%, the second was children under five years in which infection found to be 31.2 %, steroid therapy represent the third predisposing factors in 12.5%.

In addition, intertrigo and nail infection found to be more in diabetic this may be due to the warm, moist environment of the skin folds enhanced growth of *Candida* (Yaar & Gilchrist, 2003) also high blood sugar levels can weaken the patient's immune system defenses, in addition, some diabetes-related health issues, such as nerve damage and reduced blood flow to the extremities, increase the vulnerability to infection (Jautová *et al*, 2001)

Children under five years have more prone to infected with napkin rash as the

moist and macerated skin with warm and humid atmosphere of the diaper area provide ideal conditions for invasion and proliferation of candida (Krafchik et al , 2003).

Conclusion

Cutaneous candidiasis was more in diabetic patients and children, the most common clinical form of candidiasis in the study sample was intertrigo.

Recommendations

Hygiene does play a role and it is important to bathe change frequently, Avoid using very tight clothing, use drying powders in areas where there is moisture like the armpits, feet and groin regions. Minimize sweat build up by using lighter clothing especially in hot and humid climates.

Concerning napkin dermatitis, frequent diaper changes are important in newborns and infants.

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Table (1): Frequency of cutaneous candidiasis in male and female

Site of cutaneous candidiasis	Male	%	Female	%
Intertrigo	2	12.5	4	25
Napkin rash	2	12.5	3	18.7
Inter digital & nail infection	-	-	2	12.5
Corner of the mouth	2	12.5	1	6.3
Total	6	37.5	10	62.5

Table (2): Distribution of cutaneous candidiasis according to the predisposing factors:

Predisposing Factors	Intertrigo		Napkin rash		Inter digital & nail infection		Corner of the mouth		Total	
	No	%	No	%	No	%	No	%	No	%
Children		-	5	31.2					5	31.2
Diabetic	5	31.2			2	12.5			7	43.7
Antibiotic							1	6.3	1	6.3
Steroid							2	12.5	2	12.5
Elderly	1	6.3							1	6.3
Total	6	37.5	5	31.2	2	12.5	3	18.8	16	100

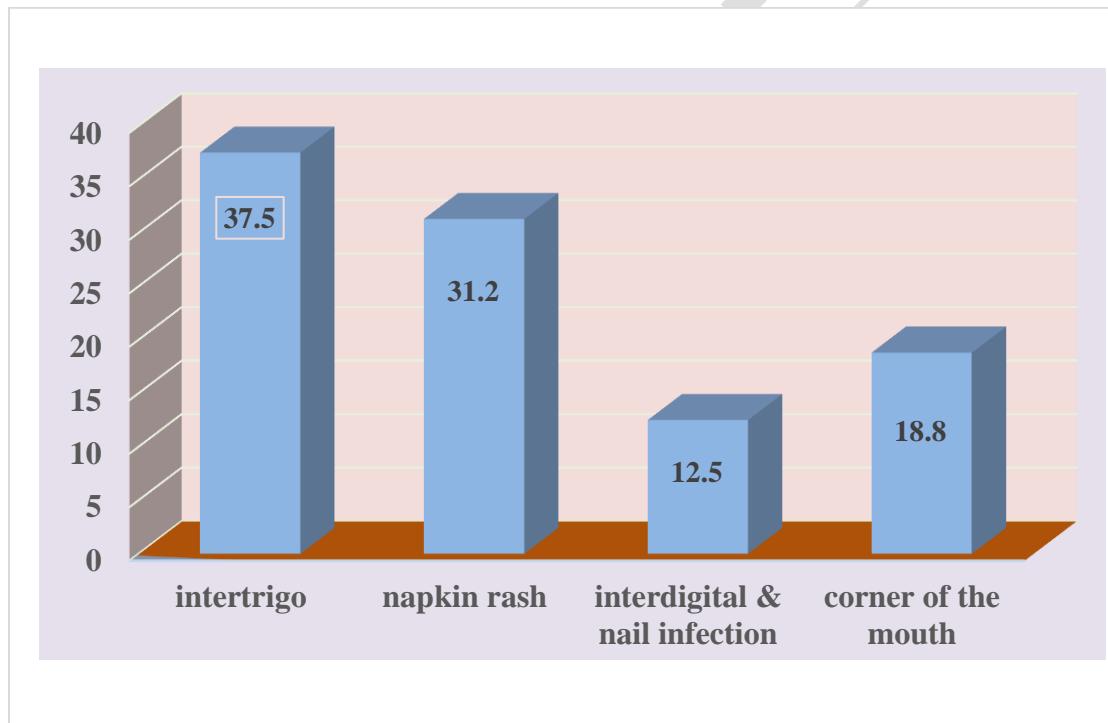


Figure (1)

Distribution of cutaneous candidiasis according to site of infection