Original Article

Candida Vulvovaginitis in pregnancy

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Summary:

Background: Vulvovaginal candiddiasis is an opportunistic mucosal infection caused by *Candida albicans* that affects large number of otherwise healthy women of child bearing age. Acute episodes often occur during pregnancy.

Patients and methods: This study was done on 50 pregnant women with *Candida* vulvovagnitis who were diagnosed by direct microscopic examination, culture technique, germ tube production, chlamydospore, and Api 20 candida system, at Baghdad Teaching Hospital in the period between October 2008 to February 2009.

Results: The study group included 50 pregnant women with *Candida* vulvovaginitis . The percentage of pregnant women with *Candida albicans* infection who their age is higher than 30 years old is 100 %(23cases), while the percentage is high as 100 % (36cases) in pregnant women whom their gestational age more than 37 week gestation. On the other hand the percentage of pregnant women who have children more than 3 (100%) (12cases). *Candida albicans* was occurred more frequently when pregnant women suffered from diabetes mellitus 100 %(14cases).

Conclusion: Direct relationship was detected between the percentage of infection and the age of the mother, gestational age, parity, and the presence of diabetes mellitus, the higher the age of the mother, gestational age, parity, and the presence of diabetes mellitus, the higher percentage of infection with *Candida albicans* during pregnancy.

Fac Med Baghdad 2010; Vol. 52, No. 2
Received May.2009
Accepted Nov., 2010

Key words: *Candida*, vulvovaginitis, pregnancy.

Introduction:

Candidiasis of lower female genital tract during pregnancy is a leading cause for seaking medical help. It is encountered in about 30% more often compared to non pregnant women (by the time of delivery about 18-22% of the pregnant women would have the infection) (1). *Candida albicans* is the most frequently found. It is charachterized by pruiritis, a cottage cheese-like discharge, odor, vulvovaginal irritation, dysuria, and dyspareunia(2). It is clinically manifested especially after 36 gestational weeks. This might be the cause of a series of pregnancy complications. The most serious are prematurity, chorioamiatis and infection from mother to newborn during delivery(3). It can be identified on direct microscopical examination and isolation on culture media including agar (4,5). Since 1970, several new antifungal agents have become available for the treatment of vulvovaginal candidiasis (6).

Patients and Methods:

Patients

Through the period from (Oct. 2008-Feb. 2009) fifty pregnant women suffering from candida infection were studied at Baghdad Teaching Hospital. A gynecologist examined all individuals with candida infection visited the hospital. The age of pregnant women ranged between (19-45) years.

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Methods

Samples were collected from each woman, using commercially produced medical cotton swabs. By the aid of sterile vaginal speculum, high vaginal region was touched in several locations by the swab until the swab completely soaked by the secretions (7).

Examination the samples: (for detection of *C.albicans*)

1. Microscopic examination: samples were examined under the light microscope for direct examination by using either Gram stain or 10% KOH (by mixing one drop of 10% KOH with one drop of specimen) (8).
2. Culture: samples were streaked on the Sabouraud's dextrose agar and on the Nutrient agar. Plates were incubated at 37C for 24-72 hour (9).
3. Germ tube production: the isolated *Candida* was inoculated in sterile tube containing human serum, and the tube was incubated at 37C for 2-3 hours. A drop of the suspension is removed and examined microscopically for the small germ tubes originating from yeast cells (10).
4. Chlamydospore production: the isolated *Candida* was inoculated on corn meal agar plates and incubated at 37C for 7 days. After the incubation period all the plates were examined under microscope for the presence of mycelia with terminal round thick-walled structures, characteristic of chlamydospores (11).
5. Api 20 *Candida* system: the Api 20 candida system was used for the identification of the yeasts isolates. This system consists of 10 different biochemical tests. The Api 20 candida system consists

of a series of 10 microcupules containing dehydrated substrates. The addition of suspension to each cupule rehydrates the substrate and initiates the reaction. The Api strip was inoculated at 37C for 10-24 hour, and then results were according to the table of the Api candida system.

The tests were carried out as follows:A suitable amount of fungal growth was emulsified into 2 ml sterile 0.85% sodium chloride using a sterile wooden applicators stick. The emulsion was then inoculated into the cupules of different tests as soon as possible. The strip was placed within the humidity chamber supplied by the manufacturer after the addition of 5 ml sterile distilled water, and then inoculated at 37C for 10-24 hour. Reading of the results were then carried out according to the color changes and compared to the standard supplied by the manufacturer.

Results

Table-1: Shows *Candida albicans* infection in pregnant women group in relation to age and gestational age. Our results shows that the rate of infection with *C.albicans* was higher among pregnant women whom their age is higher than 30 year old (23 cases) 100%, compared to the pregnant women whom their age is lower than 30 year old (14 cases) 51.9%. On the other hand, the rate of infection with *C.albicans* is increasing, reaching as high as 100% among pregnant women with gestational age more than 37 week gestation. Significant differences (p=0.001) was demonstrated in this table.

Table1. Candida albians infection in pregnant women in relation to age, partiy, gestational age and diabetes mellitus.

	Positive		**Negative**		
Age	**No.**	**%**	**No.**	**%**	**P value**
>30	23	100.0	0.	0.0	0.001
≤30	14	51.9	13	48.1	
Partiy					
>3	12	100.0	0	0.0	0.019
≤3	25	65.8	13.	34.2	
Gestational age					
≥37	36	100.0	0	0.0	0.001
<37	1	7.1	13	92.9	
DM					
Positive	14	100.0	0	0.0	0.009
Negative	23	63.9	13	36.1	

Also table-1 illustrated that the rate of infection with *C.albicans* was occurred more frequently when pregnant women suffered from diabetes mellitus (14 cases) 100%. On the other hand, the rate of infection was higher among pregnant women who have children is more than 3 (12 cases) 100%. Significant differences was demonstrated in this table.

Discussion:

The results in table-1 (age) agrees with many workers in this field Ueda and Cenginz who suggest that the older pregnant mother characterized by the lack of cell mediated immunity that enhance *Candida* colonization and serve as a risk factor for symptomatic expression of infection (12) . Also about gestational age, this finding is in accordance with many studies carried in this field which demonstrate that the high oestrogen level in pregnant women with advancing gestational age was found to reduce the ability of vaginal epithelial cells to inhibit the growth of *Candida albicans* during pregnancy (13).

In diabetic pregnant women, the rate of infection is high and compared to non diabetic pregnant women, which might be explained on the basis that there is increase in the number of intermediate vaginal epithelial cells in diabetic pregnant women compared to non pregnant women which enhance the adherence of *C.albicans* in this site (14).

Regarding the relation between the number of children and the rate of infection with *C.albicans* in pregnant women. There is a direct relationship between the parity of the mother and the rate of infection, this finding concluded previously by a study carried in this field which suggest that multigravidae significantly more affected than the primigravidae which could be due to exhaustion of the immune system leading to increased susceptibility to vulvovaginal candidiasis (15).

References:

1. Nalbanski B., Tsekova K., Ivanov S. : Candidiasis and birth canal injuries . Akush.Ginekol.(Sofiia) .2002; 41(6): 23-5.

2. Cullins V.A., Dominguez L., Guberski T., and Secor R. : Treating vaginitis . Nurse.Pract. 1999 ; 24(10): 46, 49-50.

3. Azzam W. M., Cermeno-Vivas J.R., and Orellan-Gracia Y. : Vulvovaginitis caused by Candida spp. and Trichomonas vaginalis in sexually active women. Invest.Clin.Mar.2002; 43(1): 3-13 .

4. Margaritis P.A., Astorri A.L., and Morace G. : Mycotic vulvovaginitis . Recenti.Prog.Med.1997; 88(10): 479-84 .

5. Reef S.E., Levine W.C., Smith D., and Sobel J.D. : Treatment options for vulvovaginal candidiasis . Clin.Infect.Dis. 1995; 20(1): 80-90.

6. Tobin M.J.: Vulvovaginal candidiasis: Topical US.Oral therapy. Am.Fam.Physiacian.1995; 51(7): 1715-20, 1723-4.

7. Edelin K.C. : What's causing the patient's vaginitis? Patient care.1982; 30: 15-52.

8. Emmons C.W., Binford C.H., and Utz J.P. : Medical Mycology. 1977; 5th. ed., Philladelphia .

9. Finegold S.M., and Baron E.J.: Diagnostic Microbiology. Bailey and Scott. 2001; 19 th.ed. , Mosby company. Philadelphia.

10. Arthur G. Johnson, Richard J.Ziegler, and Louise B.Hawley : Microbiology and Immunology. 1999; 3 rd.ed., Lippincott. Philadelphia. P. 169-195.
11. Baron E.J., Peterson L.R., and Finegold S.M. : Bailey and Scott's diagnostic Microbiology. 1994; 9th.ed. library of congress cataloging puplication data.
12. Ueda S.E. and Cengiz S.A. : Prevalence and phenotypic evaluation of Candida dubliniensis in pregnant women with vulvovaginal candidiasis in a university hospital in Ankara . Mycosis.Jan. 2007; 50(1): 13-20 .
13. Fidel PL.JR. , Cutright J., and Steele C.: Effects of reproductive hormones on experimental vaginal candidiasis . Infect.Immun., 2000; 68(2): 651-7 .
14. Segal E., Soroka A., and Schechter A. : Correlative relationship between adherence of Candida albicans to human vaginal epithelial cells in vitro and candidal vaginitis . Sabouraudia. 1984; 22(3): 191-200 .
15. Omar A.R. : Gram stain versus culture in the diagnosis of vulvovaginal candidiasis . East Mediterr Healthy. 2001; 7(6): 925-34 .