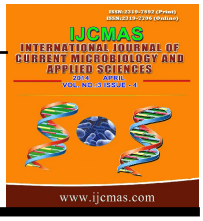

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Original Research Article

Prevalence of Candida infection in pregnant women with and without diabetes

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Keywords

Candida infection; Umaid hospital ; Candida tropicalis.

A B S T R A C T

To determine the prevalence of Candida infection in pregnant women with and without Diabetes. The present cross sectional analytical study was performed on 75 diagnosed diabetic pregnant women who were admitted to Umaid hospital, Jodhpur city, Rajasthan, India from November 2012 to July 2013 and 50 pregnant women included as a control group without diabetes. All specimen from three sites (Vaginal swab, Throat swab &Urine) were examined by conventional & automated VITEK Method. Out of 225 samples of gestational diabetic women, in 125 (55.55%) samples growth of Candida species were observed and in the rest of the samples (100, 44.44%) were no growth. The frequency of isolated Candida species were highest in vaginal swab among all three sites in diabetic pregnant women (p>.01). Candida tropicalis (17/56) were present in highest number followed by Candida albicans (11/56), Candida famata& Stephanoascus ciferrii (9/56), Candida glabrata (4/56), Candida krusei (3/56) and Candida guilliermondii (2/56) & other species (1/56) by conventional method in comparison to VITEK which identified (18/56) Candida famata, (13/56) Stephanoascus ciferrii, (7/56) Candida albicans, (3/56) Candida glabrata& Candida krusei , (1/56) Candida tropicalis, (1/56) Cryptococcus laurenti and (10/56) unidentified.In control group, out of 150 samples, only in 24(16%) samples growth of Candida species were observed.this study confirmed thatCandidiasis was more prevalent in pregnant women with diabetes than ones without diabetes. The automated VITEK system was more efficient method over the conventional method.

Introduction

Candidiasis is a yeast infection that is caused by a fungal microorganism, most often the fungus Candida albicans. Candidiasis is also known as thrush and can cause yeast infections in many areas of the body. These commonly include the mouth (oral thrush), the vagina (vaginal yeast infection, vaginal thrush) and the digestive tract (gastroenteritis) (Barnett, 2004). Infection of the mouth shows symptoms of oral thrush, yellow or white patchy lesions of the mouth and tongue.

Infection of the vagina shows symptoms such as thick discharge resembling cottage cheese, odour which is not unpleasant, vaginal itching and irritation, burning with urination, swelling of the vulva, and vaginal tenderness and pain (Hidalgo, et al., 2010). People with diabetes are more likely to develop candidiasis because the elevated level of sugar in the body provides food for yeast and encourage its overgrowth (James A. Barnett). Vaginitis can cause more inconvenience than any other gynaecological symptoms. Documented risk factors of vaginal candidiasis are pregnancy, use of high estrogen content oral contraceptives, antibiotics, steroids, chemotherapeutics, attendance at sexually transmitted diseases clinics and age.

Increased secretion of reproductive hormones during pregnancy favours the formation of infection. High levels of estrogen provide an increased amount of glycogen in the vagina, furthermore providing a good source of carbon needed for candida growth and their germination. (Sobel Odds ; Sobel). Diabetes mellitus is a chronic, insidious disease that can affect any organ of the body. One of the problems associated with this condition is infection (Malazy et al., 2006).

Patients with diabetes mellitus are at increased risk of Vulvovaginalcandidiasis (VVC) (Goswami et al., 2006). Vulvovaginal candidiasis is the second most frequent infection of the female genital tract (Sobel JD Grigoriou et al., 2006).One cause of recurrent VVC is hyperglycaemia. Diabetes and yeast infections can often occur during pregnancy. This type of diabetes is called gestational diabetes. It develops during pregnancy and often ends with pregnancy (Healthology.com). The aim of the study to determine the prevalence of Candida infection in pregnant women's with and without Diabetes.

Materials and Methods

This descriptive study was performed on 75 diagnosed diabetic pregnant women admitted to Umaid hospital Jodhpur. Diabetic affliction criterion was random blood sugar level higher than 110 mg/dl. We administered a Performa to obtain information about age, symptoms, RBS, type of samples and trimester of pregnancy. Two sterile cotton swab were used to collect vaginal discharge and mouth plaques and a sterile container were used to collect mid-stream urine. The diagnosis of samples were based on gram's stain, culture (sabouraud's dextrose agar with chloramphenicol), germ tube test and morphological identification on glucose agar test, sugar fermentation test, sugar assimilation test and automated VITEK system.

Results and Discussion

The prevalence rate of Candida species were highest in vaginal swab among all three different sites of sample.

Candida tropicalis (17/56) were present in highest number followed by Candida albicans (11/56), Candida famata& Stephanoascus ciferrii (9/56), Candida glabrata (4/56), Candida krusei (3/56) and Candida guilliermondii (2/56) & other species (1/56) (table 1) in comparison to VITEK which identified (18/56) Candida famata, (13/56) Stephanoascus ciferrii, (7/56) Candida albicans, (3/56) Candida glabrata& Candida krusei , (1/56) Candida tropicalis, (1/56) Cryptococcus laurenti and (10/56) unidentified.(table 2).

Table.1 Frequency of candida species isolated from diabetic pregnant women by conventional method

Isolated species	Total species	Urine		Vaginal swab		Throat swab	
		N0	%	N0	%	N0	%
C. albicans	29	13	44.82	11	37.93	5	17.24
C.krusei	6	2	33.33	3	50	1	16.66
C. tropicalis	34	10	29.41	17	50	7	20.58
C.glabrata	11	5	45.45	4	36.36	2	18.18
C.famata	15	3	20	9	66	3	20
C.parapsilosis	2	1	50	0	0	1	50
Stephanoascus ciferrii	24	11	45.83	9	37.5	4	16.66
C.guilleamondii	3	1	33.33	2	66.66	0	0
Cryptococcus laurentii	1	0	0	1	100	0	0
Total	125	46	36.8	56	44.8	23	18.4

Table.2 Frequency of candida species isolated from diabetic pregnant women by automated system

Isolated species	Total species	Urine		Vaginal swab		Throat swab	
		N0	%	N0	%	N0	%
C. albicans	16	7	43.75	7	43.75	2	12.5
C.krusei	5	1	20	3	60	1	20
C. tropicalis	2	0	0	1	50	1	50
C.glabrata	6	3	50	3	50	0	0
C.famata	37	11	29.72	18	48.64	8	21.62
C.parapsilosis	2	1	50	0	0	1	50
Stephanoascus ciferrii	34	16	47.05	13	38.23	5	14.70
Cryptococcus laurentii	1	0	0	1	100	0	0
Unidentified	22	7	9.33	10	33.33	5	26.72
Total	125	46	36.8	56	44.8	23	18.4

P value of Comparison between conventional & Automated method: for urine $p>.01$, for vaginal Swab $p>.01$ and for Throat swab $p>.05$

Figure.1 Germ tube identification on .1% glucose agar

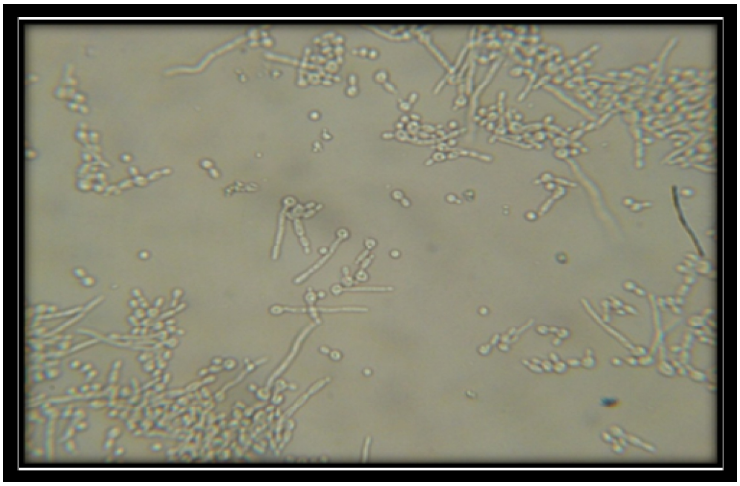
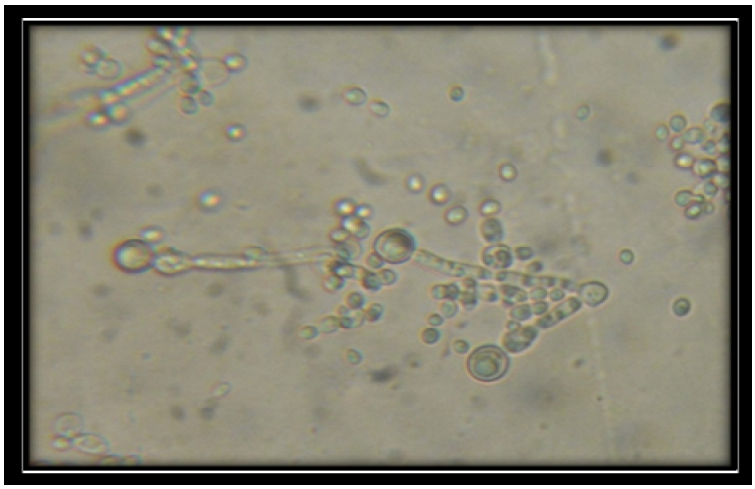


Figure.2 Chlamydospores of *Candida albicans* on 1% glucose agar



The present study was conducted in the Department of Microbiology Dr.S.N.Medical College & Associate group of Hospitals, Jodhpur, and Rajasthan, India. Prevalence of Candida infection is higher in diabetic pregnant women than healthy pregnant women because increase level of glucose in diabetes during pregnancy favours the growth of Candida species which probably showed increase prevalence of Candida occurrence of infection. Reza faraji et al (2012)[13] observed that Vulvovaginal infection in diabetic pregnant women. It is in accordance to the study conducted by Mirelababić et al (2010).[12] They found that pregnant women were more prone to Candidal infection. During pregnancy, which is listed as a risk factor, vagina is more sensitive, and the infections occur significantly more often. The high incidence of vaginitis in pregnant women is related to levels of estrogens, which is in turn considered the primary factor for the

candidiasis was more prevalent in women with diabetes than ones without diabetes. Increased glucose levels ingenital tissues enhance yeast adhesion and growth. Vaginal epithelial cells bind to Candida with greater propensity in diabetic patients than in non-diabetic patients. 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. albicansin this site. (Eman e. yousif et al 2010) [(14)]Distribution of candida species from three different sites were also observed in our study. In study group 75 samples were collected from each site. Out of 225 total samples in study group. Out of 125 positive samples, 74.66% candida was found in vaginal swab, 61.33% in urine and 30.66% in throat swab. In vagina acidic pH favours the growth of candida. This study was in accordance to Maleeha aslam et al (2008). They observed that the mechanisms by which pregnancy encourages Candida colonization are complex. During pregnancy, levels of both progesterone and estrogen hormones are elevated. Progesterone has suppressive effects on the anti-Candida activity of Neutrophils, while estrogen have been found to reduce the ability of vaginal epithelial cells to inhibit the growth of Candida albicans and also decreases immunoglobins in vaginal secretions resulting in increased vulnerability of pregnant women to vaginal Candidiasis.(Maleeha aslam. The efficacy of VITEK system and conventional methods for identification of Candida species was compared in this study. Although conventional method is gold standard method for isolation, identification and MIC determination of Candida species but it is time consuming. VITEK system is certainly the more efficient method over the conventional method as the results are available in a shorter period of time as compare to conventional methods.

The present study involve 75 diabetic pregnant women. In this study Candida carriage rate higher in diabetic pregnant women than non-diabetic pregnant women. The automated VITEK system was more efficient method over the conventional method as result are available in a shorter period of time with more specificity

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