

PREVALENCE OF VULVOVAGINAL CANDIDIASIS IN PREGNANT WOMEN VISITING FEDERAL MEDICAL CENTRE YOLA.

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ABSTRACT

A total of 100 samples of high vaginal swabs were collected from pregnant women attending antenatal clinics at Federal Medical Center Yola, and screened for presence of yeast and *T. vaginalis*. Of the 100 samples, 57 were from pregnant women with symptoms of itching while microscopic examination showed that 65% of the samples had yeast cells and 3% *T. vaginalis*. Result obtained from culture revealed yeast growth in 68% of the samples. Germ tube test showed that of the 68 samples that yielded growth, 36(52.9%) were *C. albicans*. The study showed high prevalence of vulvovaginal candidiasis in younger age (18-23) and first trimester of pregnancy

Key Words: vulvovaginal, candidiasis, germ tube test, candida albicans, oestrogen.

INTRODUCTION

Yeasts of the genus *Candida* is a normal commensal organism colonizing the vagina, particularly the *Candida albicans* species. Normally their overgrowth is prevented by the Lactobacilli (Parveen et al., 2008). Vulvovaginal candidiasis is described as consisting of white 'cottage cheese' discharge with associate vulva and vaginal inflammation. This inflammation can present as vulva pruritus, a burning sensation and/or dysuria. In a typical infection, signs include vulva erythema, oedema, excoriations and fissures. However 10-20% of healthy women have asymptomatic vaginal colonization with candida species (Haefner, 1999 and Barousee et al., 2004). Vaginal candidiasis during pregnancy is the second most common cause of vaginal infection after the bacterial vaginosis.

Approximately 75% of women experience at least one episode of vulvovaginal candidiasis and up to 5% of these women have recurrent infections (Haefner, 1999 and Mardh et al., 2002). The incidence of vulvovaginal candidiasis is highest for women aged 20-40 years and it is rare in prepubertal and postmenopausal

women (Ferris et al., 1996, Sobel et al., 1998 and Barousee et al., 2004).

Higher oestrogen levels are thought to make women more susceptible to vulvovaginal candidiasis (Sobel et al., 1998 and Bauters et al., 2002). Women on high dose oestrogen oral contraceptives have been reported to have higher rates of *Candida* colonization (Bauters et al., 2002). Zhao et al. (1995) stated that a cystol receptor for oestrogen has been documented in *C. albicans* and in vitro binding of estroglol to candida organisms enhances mycelia formation and virulence. Similarly, White and Muller (1997) postulated that high levels of oestrogen encountered in pregnancy directly enhance yeast virulence. It is not therefore surprising that during pregnancy the vagina shows increased susceptibility to infection by species of candida resulting in both higher prevalence of vaginal colonization and asymptomatic vaginitis (Sobel, 1995).

In pregnancy, vaginal candidiasis is common due to altered pH and sugar content of the vaginal secretions. Increased oestrogen level during pregnancy produces more glycogen in the vagina which has direct effect on candida growth and increases it

adherence to the vaginal epithelium. Pregnant women with diabetes are more susceptible and vaginal mycosis is four times higher in them (Parveen et al., 2008).

Recurrence of vulvovaginal candidiasis can be viewed as relapsing or re-infection. Relapsing episodes of vulvovaginal candidiasis are caused by an identical strain type of *C. albicans*. Vazquez et al., (1994) in a retrospective review, found eight out of 10 women with recurrent vulvovaginal candidiasis over a mean of 3.1 years consistently demonstrated the same *C. albicans* strain. In reinfection or secondary infection, vulvovaginal candidiasis either host or microbial factors are responsible. Host factors include use of broad spectrum antibiotics, oral contraceptive pills, intrauterine contraceptive device (IUCD), use of corticosteroids, HIV/AIDS, weakened immune system and topical use of antimicrobial agent. Microbial factors chiefly consist of non *Candida albicans* species, mostly *C. glabrata*. Behavioural factors that trigger episodes of vulvovaginal candidiasis include sexual practices, clothing habit, use of vaginal douches, sanitary practice and diet (Barousee et al., 2004; Sheary and Dayan 2005 and Parveen et al., 2008).

Vaginal candidiasis can cause abortion, candida chorioamnionitis and subsequent pre term delivery. Premature neonates are severely endangered by generalized fungal infection because of their immature immune system. During delivery, transmission can occur from the vagina of infected mother to the newborn giving rise to congenital candidiasis. Infants with oral thrush can give rise to nipple candidiasis in breast feeding mothers. Hence several investigators have recommended routine pre natal screening and treatment of vaginal candidiasis (Omar, 2001 and Parveen et al., 2008)

In view of the high rate of susceptibility of pregnant women to vulvovaginal candidiasis and the risk the disease constitutes to pregnant women and their unborn babies, a research of this nature was

embarked upon to determine the prevalence of vulvovaginal candidiasis among pregnant women. The issue in context is to determine the stage of pregnancy and age of pregnant women at which the infection is highest.

Methodology

Sample Collection

One hundred HVS specimens were collected in duplicate from pregnant women visiting Federal Medical Center, Yola using sterile swab stick. The duplicate swab sticks from each pregnant woman were appropriately labeled indicating age of pregnant woman and stage of pregnancy. The pregnant women from whom specimens were collected were also asked whether they experienced symptoms of itching at the vagina. All samples collected were transported to the Microbiology Department Laboratory, Federal University of Technology, Yola for onward analysis.

HVS Wet Preparation for Identification of yeast cells

Wet preparations of the specimens collected were carried out as described by Cheesbrough (2002) to investigate the presence of yeast cells. This was done by adding two drops of normal saline into one of each duplicate swab sticks. The swab and normal saline were mixed properly and a drop of it was made on clean grease free slide, cover with a cover slip and examined under x10 and x40 objective lens.

Isolation and Identification of Yeast

High vaginal swabs specimens on the other duplicate swab sticks were cultured on sabouraud dextrose agar and incubated at 37^oc for 3days. All isolates obtained were gram stained to examine budding yeast cells and pseudohyphae

Identification of *Candida albicans*

Germ tube test was carried out on all the yeast isolates to confirm *Candida albicans* (Cheesbrough, 2002). 500 μ l (0.5 ml) of human serum was pipetted into a small sterile test tube. With the aid of a sterile wire loop,

the serum was inoculated with a colony of yeast isolates from the culture plate and was incubated at 37^oc for 3hrs (Baker et al., 1998). Using a Pasteur pipette, a drop of serum yeast culture was made on glass slide and covered with cover slip and examined using x10 and x 40 objective lens. Sprouting yeast cell were reported as *Candida albicans*, while other yeasts that were not sprouting were reported as yeast other than *C. albicans* isolates.

Results

Of the 100 hundred HVS specimens collected from pregnant women, 57 were symptomatic for itching. Microscopy of samples collected showed that 65% had yeast cells while 3% were found to contain *T. vaginalis*. Others showed pus and epithelial cells under the microscope.

Results obtained from culture showed that 68% of the samples yielded growth of yeast while 32% showed no growth (Table 1)

Table 1

Age (Yrs)	Group	No. of samples of HVS cultured	No. of samples that yielded yeast	% of samples that yielded growth of yeast
18 - 23		39	23	33.8
24 - 29		35	22	32.4
30 - 35		14	11	16.2
36 - 41		9	10	14.7
≥ 42		3	2	2.9
TOTAL		100	68	100

Results on table 2 show that highest growth of yeast occurred in samples collected from pregnant women in the first trimester (47.0%), followed by second trimester (30.8%) and then the third trimester (22.0%).

Table 2

Stage of pregnancy (months)	No. of sample cultured	No. of HVS yielded growth	% of sample that yielded growth
1 - 3	33	32	47.0
4 - 6	35	21	30.8
7 - 9	32	15	22.0
TOTAL	100	68	100

Results obtained from gram staining revealed budding yeast cells and pseudohyphae of the samples from positive culture. Germ tube test based on ages of pregnant women showed that 18-23 years had the highest infection due to *C albicans* (41.6%) followed by 24-29 years (25.0%), 30 - 35 years (16.6%) and age's ≥ 42years had the lowest (2.8%) Table 3.

Table 3

Age Group (Yrs)	No. of samples that yielded yeast isolate	No. of <i>C. albicans</i> confirmed by Germ tube test	% of <i>C. albicans</i> confirmed
18 - 23	23	15	41.6
24 - 29	22	9	25.0
30 - 35	11	6	16.6
36 - 41	10	5	13.9
≥ 42	2	1	2.8
TOTAL	68	36	100

Germ tube test based on stages of pregnancy showed high vulvovaginal candidiasis due to *C. albicans* in the first trimester (58.3%) followed by (25.0%) for second trimester and the third trimester had the least with (16.6%).

DISCUSSION

In this study, 100 HVS samples collected from pregnant women were analysed for presence of yeast cells and *C. albicans*. Microscopy results showed that 65 specimens have yeast cells and three showed *T. vaginalis*.

Culture of the HVS samples yielded 68 yeast isolates although only 65 samples showed yeast cell in microscopic examination. This implies that microscopy is not sensitive enough to capture all cases of vulvovaginal candidiasis due to yeast, even though it is important in excluding cases of *T. vaginalis* since it also present itching symptoms.

Result obtained from Germ tube test on the 68 yeast isolates confirmed 36 of the isolates to be *C. albicans*, while the other 32 were yeast other than *C. albicans*. This implies that other yeast could commensally exist in the vagina and can be involved in vulvovaginal candidiasis infection in pregnant women. Out of the 57 pregnant women with symptoms of itching, *C. albicans* were confirmed in 36 of them showing that other agents such as bacteria, protozoa and non *albicans* yeast could be responsible for vulva itching.

The highest prevalence of *C. albicans* was recorded in the first trimester where 32

pregnant women were positive and less in the second trimester and third trimester. This could be due to the sudden change in hormonal balance during early stage of pregnancy and increased production of the hormone oestrogen and a gradual gain in balance of the hormone in the second and third trimester respectively (Sobel et al., 1998 and Bauters et al., 2002).

The study also showed that pregnant women within the younger age bracket of 18-23 years suffer most from vulvovaginal candidiasis since 15 (41.6%) samples were confirmed to be positive for *C. albicans*. This trend may be linked to the fact that most women within this age bracket are experiencing their first pregnancy, hence may lack experience on how to manage themselves. Besides, it could also be attributed to the fact that at younger age the production of the hormone oestrogen may be very high thus being responsible for the high rate of infection, since it has been shown that oestrogen production decreases significantly with increase in age in women (Minaker, 2007). Results obtained from the studies shows that vulvovaginal candidiasis decreases with increase in age which is in line with the work of Hurey and Delouvois (1979); Sobel et al. (1998); Ferris et al. (1996) and Barousee et al. (2004).

In view of the health risk associated with *Candida* infections and its consequent negative effect on population growth and economic development, it is imperative to introduce the diagnosis of vulvovaginal candidiasis as part of routine check during antenatal care especially for women within the age 18-23 years who may likely be experiencing their first pregnancy and in the first trimester. This will help greatly in combating the maternal and child health risk posed by vulvovaginal candidiasis. In addition, there is need to enlighten pregnant

women on the dangers of vulvovaginal candidiasis and various hygienic practices required of them to prevent infection during pregnancy.

Further research is encouraged in areas such as dietary habit, dressing habit, socioeconomic status health conditions and other risk factors that can predispose pregnant women to vulvovaginal candidiasis, since the current work looked at candidiasis among pregnant women without specifying any predisposing factor.

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