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Prevalence of Vaginal Candidiasis among Pregnant Women in Nnewi Town of Anambra State, Nigeria (Pp. 539-548)

Okonkwo Nnaemeka J. - Department of Parasitology and Entomology, Nnamdi Azikiwe University, P.M.B. 5025, Awka, Anambra State, Nigeria.
E-mail: mumamaka@yahoo.com, ннаemekaokonkwo_2009@yahoo.com

Umeanaeto Pauline U. - Department of Parasitology and Entomology, Nnamdi Azikiwe University, P.M.B. 5025, Awka, Anambra State, Nigeria.

Abstract

*Vaginal specimens were collected from three hundred pregnant women attending pre-natal visits in three selected hospitals in Nnewi, Anambra State, Nigeria. All pregnant patients were considered throughout the period of the study, that is, total sampling having obtained an informed consent from them. Ninety patients were positive for vaginal candidiasis thus, giving a prevalence rate of 30%. The pregnant women aged 26 to 30 recorded the highest prevalence (13.669; $df = 5$) which is statistically significant ($p < 0.05$). The women who were in their third trimester of pregnancy were mostly infected (6.163; $df = 2$) and the infection status was highly significant ($p < 0.05$). The symptomatic and asymptomatic patients were uniformly exposed to the *Candida* infection hence, there was no significant difference between them ($p > 0.05$). Further stratification of the pregnant women according to their parity revealed that *Candida* infection decreases with parity and is significantly higher in pregnant women who are in their first or second pregnancy p_0-1 . Consideration of the socio-economic status of the women in terms of vaginal candidiasis showed no significant difference ($p > 0.05$). The findings of the present study were discussed.*

Key words: *Candida*, vaginal candidiasis, pregnancy, hospitals in Nnewi

Introduction

Vaginal candidiasis (VC) is a fungal or yeast infection of the vulva and/or vagina. It is a common gynaecologic ailment, affecting three out of four women in their lifetime (Das-Neves *et al.*, 2008). More than 40% of affected women would have two or more VC episodes (Ferrer, 2000; Eschenbach, 2004). The ailment causes a smelly, thick, white-yellowish discharge that might be accompanied by itching, burning and swelling. It could also make walking, urinating or having sex very painful. This health problem can as well present occasionally even in the healthiest of women. However, it is more common and severe in women with weakened immune systems, and accordingly, pregnancy is one of such factors that contribute to lowered immunity (Monif *et al.*, 2003).

Candidiasis generally, is an opportunistic infection caused by a yeast-like fungus, *Candida*. The fungi are endogenous in man, occurring as part of the harmless commensals of the genital, gastrointestinal and respiratory tracts, human oral and other surfaces. Establishing *Candida* as the cause of vaginitis can be a difficult task, for the fact that, as many as 50% of asymptomatic women do have *Candida* organisms as part of their endogenous vaginal flora; hence limitations of signs and symptoms in the diagnosis of vaginal infection has been recognised (Akinbiyi *et al.*, 2008). Thus, mere isolation of *Candida* in the laboratory does not show real indication that it is the cause of any disease condition as other causes of vaginitis may include *Trichomonas vaginalis* and bacterial vaginosis.

Under normal circumstances, the *Candida* yeast is held in check by normal body defences together with other members of the normal flora. For instance, the acidity of the vagina is maintained at pH 4.0-4.5 (Nyirjesy, 2008). This acidity level prevents some vaginal pathogens from establishing. However, physiological changes in the balance of the body system would affect both beneficial and harmful yeasts, bacteria and other organisms in the body. This accordingly would alter the acidity of the vagina reducing it to pH 5.0-6.5, thereby giving room for the establishment of pathogenic organisms such as *Candida* (Akinbiyi *et al.*, 2008). Vaginal pH may increase with age, phase of menstrual cycle, sexual activity, contraception choice, pregnancy, presence of necrotic tissue or foreign bodies, and use of hygienic products or antibiotics (Nyirjesy, 2008).

It is generally believed that higher estrogen levels and higher glycogen content in vaginal secretions during pregnancy increase a woman's risk of developing VC, and it is known to be so common in women during their child-bearing years (Monif *et al.*, 2003). *C. albicans* infection occurs in the vast majority (80% to 90%) of diagnosed cases, while infection with other species, such as *C. glabrata* or *C. tropicalis*, occurs less frequently (Baron *et al.*, 1993). With adequate pharmacotherapy and avoidance of contributing factors (eg, douching, wearing tight pants), VC and associated symptoms resolve in a short period of time.

The objective of this study was to determine the prevalence of VC in clinically symptomatic and asymptomatic cases of pregnant women attending routine prenatal clinic in selected hospitals in Nnewi (Nnewi North Local Government Area) of Anambra State, Nigeria.

Materials and Methods

Study Area

The study was carried out in three selected hospitals in Nnewi urban in Nnewi North Local Government Area of Anambra State, South-east geographical zone of Nigeria. These included, Summit Hospital and Maternity; Divine-Care Hospital and Maternity and Nnamdi Azikiwe University Teaching Hospital (NAUTH). Nnewi urban is a commercial centre with a population of about 278,642 people, both male and female (National Population Commission 1991) and located in the South-eastern zone of Nigeria. The majority of the inhabitants of the town are businessmen and women, although a good number of civil servants, students and other professionals, live amongst them.

Choice of Patients

Patients selected for the study were pregnant women attending prenatal visits in the hospitals aforementioned. All the pregnant patients attending were included, that is, total sampling, irrespective of their trimester, age, parity and socio-economic status. Vaginal specimens were collected from them using swab sticks having obtained an informed consent from the patients. The swab specimens were analyzed in the Microbiology Laboratory of NAUTH. The swabs were cultured initially in Sabouraud and blood agar media under sterile condition at 37⁰ for 24 hours. Subsequently, smears were made from the swabs using physiological saline and the wet mount examined microscopically at 40x objective for the presence of pseudohyphae and/or budding yeast cells indicative of *Candida* (Cheesbrough, 2000).

Furthermore, simple questionnaires were used in obtaining requisite demographic information about the patients. All the pregnant women who complained of certain symptoms as vaginal discharge, vulval itching, painful sensation after urination and others were termed symptomatic. The rest were classified asymptomatic. The data obtained were analysed using computer programme for t-test statistical package.

Results

Positive *Candida* growths were characterized by smooth grayish-white colonies with filamentous edges after 24 hours. A large number of vaginal swabs were obtained from the collections made. Out of the 300 pregnant women examined, 90 were *Candida* positive, thus indicating a prevalence level of 30% in the study population. Table 1 shows that the pregnant women aged 26 to 30 years have the highest prevalence (13.669; df = 5) of vaginal candidiasis; but relatively very low between the ages 36 to 45 years. Result of the t-test with the data showed that age specific infection is statistically significant ($p < 0.05$). The rate of infection appears to be on the increase with the duration of the pregnancy (trimester). Thus, the prevalence of VC is much more predominant (6.163; df = 2) in the third trimester (Table 2) but significantly ($p < 0.05$) low in the first trimester.

The proportion of symptomatic pregnant women was not significantly different ($p > 0.05$) from the asymptomatic patients (Table 3). Further stratification of the patients according to their parity indicated that the proportion of patients with the disease problem decrease with parity and the prevalence was significantly higher ($p < 0.05$) in women who are in their first pregnancy i.e primigravidae than in women who have had several births (Figure 1). Considering the socio-economic status of the patients in relation to VC infection (Figure 2) showed no significant difference ($p > 0.05$) between highly educated women with tertiary education and the others.

Discussion

The fact that *Candida* infection of the genital tract is one of the commonest sexually transmitted diseases and the most singular cause of vaginal discharge, is well understood and calls for a more radical approach to its management (Ojengbede *et al.*, 1988). Vaginal candidiasis is an all female disease especially those of childbearing age and pregnant women (Monif *et al.*, 2003). Pregnant women are more susceptible to both vaginal colonization and infection by yeast (García *et al.*, 2006). It is generally believed that VC occurs commonly and is difficult to cure in pregnancy and in the diabetics.

This is because the treatment of these patients is so unsatisfactory and recurrence so common despite the use of potent antibiotics to which *C. albicans* is highly sensitive; there is considerable maternal disability and neonatal infection. Patients and physician are likely to become exasperated by failure of therapy.

In the present studies specifically focused on the pregnant women alone, the prevalence of VC of 30% is outstanding. This prevalence rate is far higher than 14% reported in Burkina Faso (Meda *et al.*, 1997) but agrees very closely with 30.7% reported in Jamaica (Kamara *et al.*, 2000). The age group of 26-30 years represents the peak of childbearing in the Nigerian society; and it is among this group that significantly high prevalence of VC occurs. It has been observed that there is high concentration of oestrogen hormone during pregnancy and this provides favourable environment for the growth of *Candida* (García *et al.*, 2006; Glatthaar *et al.*, 1982). Advance in age on the other hand, reduces the effect of the oestrogen hormone in women, which could lead to lower infection rate as women advance in age. However, no age group was absolutely free of infection by VC. It is also interesting to note that the number of older pregnant women (age group 41-45) recorded in the present study was small. Thus indicating that they may be passing the childbearing age and women tend towards menopause (ceasation of menstruation) as age increases and only few may conceive within this age group.

The highest prevalence of VC was observed in the last three months of pregnancy (ie third trimester). This is comparable with the observation by Glatthaar *et al* (1982), who demonstrated too that vaginal acidity and hormonal factors influenced the rate of occurrence of VC more in pregnant women, especially in the last trimester. Also Gardner and Kaufman (1982), reported a predominant incidence of *Candida* species in the vaginas of up to 36% of pregnant women with about 15-20% of them near term. Pregnancy suppresses immune reaction and as such pregnant women are more vulnerable to infection by disease pathogens. During pregnancy, the vagina becomes less acidic and less able to fight diseases or infections. The more advanced the pregnancy is, the more vulnerable the pregnant mother becomes to infection, hence the highest prevalence in the third trimester.

The fact that in the first trimester, there are physiological changes in the body of a pregnant woman due to early pregnancy does not imply that early pregnancy contributes to *Candida* infection. Significantly, in the last

trimester, the pregnancy is near term and there may be repeated vaginal examinations as well as pelvic examinations in preparation for delivery. These can predispose the mother to greater chances of VC. Also, when pregnancy is near term, there may be reduction in the hygienic status of some pregnant mothers such as failure to wash their undies and pubic areas properly or not at all due to fatigue or the tummy size thereby encouraging vaginal infections.

Examination of vaginal swabs from the symptomatic and asymptomatic pregnant showed that not all who complained of symptoms were positive for *Candida* species and some of those who did not have any symptoms were positive too. This showed that the complained symptoms from symptomatic patients who tested *Candida* negative may be due to other problems. Other common causes of vaginitis including *Trichomonas vaginalis*, *Gardnerella* and bacterial vaginosis (Akinbiyi *et al.*, 2008; Hatcher *et al.*, 1991; Ogbonna *et al.*, 1991); as well as pediculosis and scabies (Hatcher *et al.*, 1991), present symptoms as those of VC.

Further stratification of the study patients based on the previous childbirth has shown that prevalence of VC decreases with more childbirths, thus, the primigravidae and those in their second pregnancy have the highest prevalence. As the women give birth to more babies, they have more experience relating to pregnancy and infections. They acquire better knowledge through antenatal lectures together with personal experiences while those in first and second pregnancies are less experienced and less knowledgeable. This could be part of the reasons for the high prevalence case among them.

Prevalence with respect to socio-economic status was not significant. The highest occurrence was found among those below tertiary educational qualification. However, all the women were relatively equally exposed to infection by VC, but ignorance can play a large role in predisposing the lower socio-economic class to higher infection. This agrees with the fact that microbial agents including *Candida* (Ogbonna *et al.*, 1991) are more prevalent among the lower socio-economic groups.

Conclusion

Pregnant women are more vulnerable to vaginal candidiasis irrespective of their age, trimester, parity, occupation and educational level. With adequate pharmacotherapy, avoidance of contributing factors (eg, douching, wearing

tight underwears) and general personal hygiene, vaginal candidiasis and associated symptoms can resolve within a short period of time.

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Table 1: Age-specific Prevalence

Age	Number sampled	<i>Candida</i> positive	Proportion of <i>Candida</i> positive women
16-20	35	10	0.2857
21-25	77	18	0.2338
26-30	115	38	0.3304
31-35	54	19	0.3519
36-40	13	3	0.2308
41-45	6	2	0.3333
Total	300	90	

Observed *t*-value = 13.669, *df*= 5; and table value = 2.57; *p* < 0.05.

Table 2: Prevalence in order of Trimester

Trimester	Number sampled	<i>Candida</i> positive	Proportion of <i>Candida</i> positive women
First (0-3 months)	32	10	0.3125
Second (4-6 months)	78	15	0.1923
Third (7-9 months)	190	65	0.3421
Total	300	90	

Observed *t*-value = 6.163, *df*=2; and table value = 4.30; *p* < 0.05.

Table 3: Prevalence of vaginal candidiasis in symptomatic and asymptomatic pregnant patients

Parameter Considered	Number sampled	<i>Candida</i> positive	Proportion of <i>Candida</i> positive women
Symptomatic	155	51	0.329
Asymptomatic	145	39	0.269
Total	300	90	

Observed *t*-value = 9.967, *df*=1; table value = 12.71; *p* > 0.05.

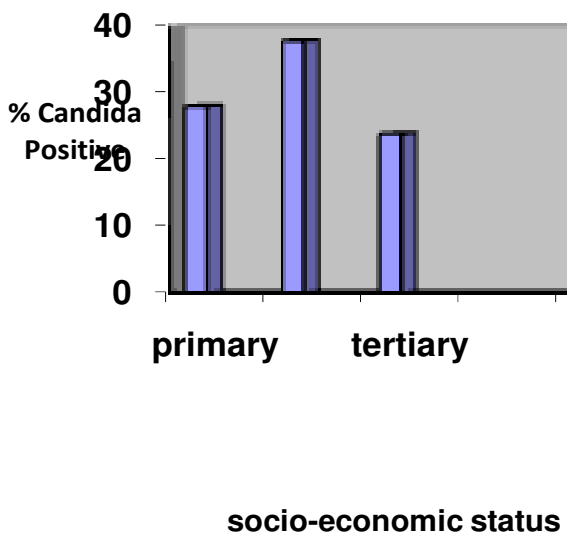


Figure 1: Bar Chart showing prevalence of vaginal candidiasis in pregnant women with respect to their socio-economic status.