PREVALENCE OF VAGINAL CANDIDIASIS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN DOMA HOSPITAL, GOMBE, NIGERIA

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ABSTRACT

Pregnant women commonly develop increased vaginal discharge which may lead to pregnancy complications like abortions, premature birth, low birth weight and other morbidities. This study was aimed to determine the occurrence of vaginal candidiasis among pregnant women attending antenatal care in Doma Hospital Gombe, Nigeria. A total of fifty (50) pregnant women were examined. Samples of high vaginal swabs were collected from each patient and tested by microscopic examination then cultured on Sabouraud Dextrose agar [SDA]. Colonial morphology, wet preparation, gram staining, germ tube test, were carried out for identification of the isolated organisms. From the total fifty (50) samples collected and examined for candida, thirty-eight (38) (76%) showed positive while twelve (12) (24%) showed negative. The isolates obtained were related to number of pregnancy (gravidae), 25(65.5%) were multi-gravidae while 13(25.5%) were primigravidae. The result of this study revealed that pregnant women in the second trimester of pregnancy had the highest incidence of candidiasis 20(52.5%), followed by third trimester 12(31.5%) while the least 6(16%) was obtained in first trimester. Furthermore, age between 21-25 years had highest occurrence of *Candida albican*s 15(39.5%), followed by age between 26-30 years 10(26.5%), age 31-35 had 7(18.5%) where age between 16-20 years had the least occurrence 6(15.5%).The results of this study revealed a high occurrence of vaginal candidiasis among pregnant women and this may be due to contributing factors poor personal hygiene during pregnancy, poor dietary habit, wearing of tight-fitting synthetic underclothing, shortage of effective treatment, high sexual activities during pregnancy, change in pH of the vagina

Keywords: Antenatal, Candidiasis, Pregnancy, Candida, Gravidae.

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 episode (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).

Generally, candidiasis 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 (e.g., douching, wearing tight pants), VC and associated symptoms resolve in a short period of time (Akinbiyi *et al.*, 2008).

According to Shuaibu *et al*., (2016), out of two hundred (200) pregnant women attending antenatal clinic at Gombe Specialist Hospital analysed for candidiasis, one hundred and twenty-six (126) (63%) were positive. The result reveals that *Candida albicans* was prevalent among the attending pregnant women that patronize Gombe Specialist hospital.

It is inferred from that there is no adequate sensitization on candidiasis among the pregnant in Gombe State and this may result to increase in the number of infected persons and more also generate a serious public health issue in near future if not put under control, it is therefore become importance to isolate and identify *C. albicans* and also determine the frequency of occurrence of vaginal candidiasis based on gravid, trimester and age differences

during pregnancy among pregnant women attending antenatal clinic in Gombe metropolis using Doma hospital as a case study.

MATERIALS AND METHODS

Study Area

The study area was Doma hospital situated in commercial area within Gombe metropolis behind the central market, Gombe state, a state in the south eastern Nigeria. The hospital is third in ranking after federal medical centre and specialist hospital. People of different caliber and ethnic background majorly patronize the hospital irrespective of their financial statues. Women of age range of 16- 35 years were clinically assessed. They were chosen because they are within the range of high-risk group, are sexually active and as well, are the most vulnerable because of the nature of their immune systems.

Sample Collection

High vaginal swab (HVS) samples were used for this study. A total of fifty (50) high vaginal swab (HVS) samples were collected aseptically using commercially prepared swab sticks from the pregnant women attending antenatal clinic at Doma hospital. The urethral orifice of the women was clean with normal saline, the swab stick was inserted into the urethra and rotated gently without touching the wall of the virginal. The collected samples were kept in a container containing ice block and transported immediately to laboratory for further investigation. The samples collection was conducted for a period of two months.

Macroscopic Examination of the Samples

Macroscopic examination was conducted on the samples. The collected samples were examined for color, appearance and odor.

Microscopic Examination of the Samples

A few drops of normal saline were added into the HVS swab tube, the swab stick place back in the tube and then tapped vigorously to mix the material with normal saline. A drop of the suspension was put on a clean grease free slide, covered with a cover slip and then examined under the microscope for identification of budding yeast cells (Cheesbrough, 2008).

Culture of the Collected Samples

Each patient's sample was inoculated unto Potato Dextrose Agar plates (PDA) by the streak plate technique. The inoculated plates were incubated at room temperature for seven (7) days for proper growth of the isolates to be established. The morphological characteristics of the colonies were monitored for each day and recorded (Chessbrough, 2008).

Identification of the Isolates

The isolates were identified based on their cultural morphology, cellular characteristic. The characteristics were based on the colour, pigment formation, structure of the colonies, edge and form of the colonies on the agar. Further microscopic examination following lactophenol staining was also conducted and certain morphology such as pseudohyphae and ascospore formation were observed. Both the colony and cellular characteristic were compared with those of

known clinical isolates taxa (Kurtzman *et al*., 2011).

Germ Tube Test

Germ tube test was also conducted for the isolates for further characterization.

Pooled human serum was collected and 0.5ml of it was pipette into a test tube, the tip of a sterile pipette was used to pick the colony and emulsified in the serum in the tube, this was the n followed by incubation of the mixture for three (3) hours at 37^0C. after three (3) hours of the Germ tube test, a drop of the mixture was placed after every 30 minutes to 1hr into cleaned grease free slide and covered with a cover slip and examined under the microscope for pseudomycellium formation which indicates a positive Germ tube test.

RESULTS

The occurrence of vaginal candidiasis among women attending Doma hospital is presented in Table 1. The result showed that out of fifty (50) women examined for vaginal candidiasis, thirty-eight (38) (76%) showed positive and twelve (12) (24%) showed negative.

Table 1: Frequency of Occurrence of Vagina Candidiasis among Pregnant Women

Sample	Frequency	% frequency
Positive	38	76
Negative	12	24
Total	50	100

The frequency of occurrence of vaginal candidiasis among the pregnant women based on gravidae is also presented in table 2 below. Thirteen (13) (34.5%) of the positive samples were found to be primigravidae while twenty-five (25) (65.5%) were multigravidae.

Table 2: Frequency of Occurrence of Vaginal candidiasis based on number of pregnancy (Gravidae)

Gravidae	Frequency	% frequency
Primigravidae	13	34.5
Multigravidae	25	65.5
Total	38	100

Frequency of occurrence of candida based on trimester is also determined table 3 below. Based out of the thirty-eight (38) (76%) positive samples, six (6) (16%) were women in their first trimester of pregnancy, twenty (20) (52.5%) second trimester and twelve (12) (31.5%) in their third trimester of pregnancy.

Table 3: Frequency of Occurrence of Vaginal candidiasis-based Trimester Distribution

Trimester	Frequency	% frequency
First	6	16
Second	20	52.5
Third	12	31.5
Total	38	100

The occurrence of *Candida albican* from the pregnant women based on age differencesis represented in table4. Out of the thity-eight (38) (76%) positive the result, the age 16-20 showed 15.5%, age 21-25 showed 39.5%, age 26-30 showed 26.5% and ages 31-35 showed 18.5% respectively.

Table4: Prevalence of Candida in Relation to Gestation Age

Age Grouping	No of Isolates	No of Positive Samples	% Growth
16-20	8	6	15.5
21-25	17	15	39.5
26-30	15	10	26.5
31-35	10	7	18.5

DISCUSSION

From the results obtained, it is obvious that there is high rate of vaginal candidiasis among pregnant women attending Doma hospital in Gombe state. Out of total fifty (50) women examined, thirty-eight (38) (76%) showed positive while only twelve (12) (24%) were negative Table 1 above. This result is like the findings of (Nwokedi and Aniyam, 2003; Akah *et al.,* 2010,) who also reported a prevalence rate of 60% and 62.2% among pregnant women in Kano and Enugu State, Nigeria respectively. The high occurrence observed may be attributed to inadequate knowledge, poor personal hygiene, limited diagnostic facilities, poor dietary habits, shortage of effective treatment, increased levels of estrogens and corticoids, wearing of tight-fitting synthetic underclothing, prolonged use of antibiotics which kill the normal body flora.

The positive 38(76%) results obtained were also analysed based on gravidae. From the results, thirteen (13) (35.5%) were found to be privigravidae (women with first pregnancy) while twenty-five (25) (65.5%) were found to be multigravidae (women that has experience of more than one pregnancy) table 2. Consequently, the result of this work is in agreement to that of Aslam *et al.,* (2008) who reported an occurrence of 60% among the multigravidae and 40% among primigravidae. This high occurrence among the multigravidae may be due to consequence use of contraceptive and antibiotics and more also could also be due to the fact that multigravida has longer sexual history and also number of pregnancies that make them more prone to develop vaginal candidiasis than primigravidae who have less sexual exposure.

The women also categorized and examined based on trimester. The frequency of occurrence of vaginal candidiasis based on trimester as indicated in table 3 showed that pregnant women in their second trimester had the highest occurrence of Candida infection (62.5%),followed by women in their third trimester (31.5%) and the least occurrence was observed in pregnant women in their first trimester of pregnancy (16%). This agreed with earlier reports of Baker, (2006) but in contrast with the work of Nelson *et al*., (2013) who found that pregnant women in their third trimester had the highest prevalence of vagina candidiasis (68.09%) followed by second trimester (21.28%) and the least in first trimester (10.63%). This high occurrence of Candida observed and recorded in the second trimester may likely be as a result of fetal demand for nutrients.

The prevalence of candida in relation to age differences(table 4) showed that ages 21-25 close had the highest occurrence rate of 15 (39.5%), and age 26-30 close showed occurrence rate of 10 (26.5%), age 31-35 close showed the occurrence of 7(18.5%) while the least was observed in age 16-20 close 6(15.%). This report agreed with the work of Willacy *et al*., (2011)., who reported a peak vaginal infection between age group 20-40 close. This high occurrence recorded among age group 21-

25 may be due to high sexual activity, poor personal hygiene, the use of contraceptives and drug abuse among this age group.

CONCLUSION

The results obtained in this study showed a high occurrence of candida among pregnant women attending antenatal care in Doma hospital Gombe metropolis, Gombe, Nigeria. High occurrence was observed among multigravidae, women at the second trimester and those women within the age range of 21-30 close. The high occurrence might be attributed to factors such as inadequate knowledge about candida in pregnancy, poor personal hygiene during pregnancy, poor dietary habit, wearing of tight-fitting synthetic underclothing, shortage of effective treatment, high sexual activities during pregnancy, change in pH of the vagina and suppress in the immune reaction during pregnancy. High occurrence of vaginal candidiasis during pregnancy may likely result into the risk of miscarriage, premature birth, fetal oxygen deficiency, and low birth weight and neonate mortality. Other possible risks include pelvic inflammatory disease, infertility, pelvic abscess, stress, discomfort and irritation.

REFERENCES

Akah, PA, Nnamani, CE, Nnamani, PO, (2010). Prevalence and treatment outcome of vulvovaginal candidiasis in pregnancy in a rural community in Enugu State, Nigeria.*Journal of Medicine and Medical Sciences*1: 447-452.

Akinbiyi, AA, Watson, R, and Feyi-Waboso, P, (2008). Prevalence of *Candida albicans* and bacterial vaginosis in asymptomatic pregnant women in South Yorkshire, United Kingdom. *Arch. Gynecol Obstet.* 278: 463-466.

Aslam, M, Hafeez, R, Ijaz S, Tahir, M, (2008). Vulvovaginal Candidiasis in Pregnancy. *J. Microb Biomedica* 24: 54-56.

Baker, PN, (2006) Infection in Gynaecology.In: Obstetrics by Ten Teachers. Eightheenth edition. Hodder Arnold London:167-169.

Baron, EJ, Cassell, GH, Duffy, LB, Eschenbatch, JR, Greenwood, SM, Harvey, NE, (1993). Laboratory Diagnosis of Female Genital Tract Infection. Cumulative Techniques and Procedures in Clinical Microbiology (Cumitech) 17A.

Chessbrough, M, (2008). *Fungal Pathogens.* District Laboratory Practice in Tropical Countries (Part II): 235-248.

Das-Nerves, J, Pinto E, Teixeria, B, Dias, G, Rocha, P,Chunha, T. (2008). Local Treatment of Vulvovaginal Candidosis: General and Practical Considerations. Drugs 68(13): 1787-802.

Eschenbach, DA, (2004). *Chronic vulvovaginal candidiasis. N. Engl. J.Med.351 (9): 851–2.*

Ferrer, J, (2000). Vaginal candidosis: epidemiological and etiological factors. *Int. J. Gynaecol. Obstet.*71 (Suppl_1): S21–7.

Kurtzma, CP, Fell, JW, Boekhout, T, Robert, V, (2011). Methods of isolation, Phenotypic characterization and maintenance of yeasts. The yeasts, a Taxonomic Study, 5th edn. Elsevier, pp 87-110.

Monif, GR, Baker, DA, Monif, GR, Baker, DA, (2003). *Candida albicans. Infectious diseases in obstetrics and gynecology.* 5th ed. New York Parthenon Press: pp 405–21. Patients and Carriers in Nigeria. Mycoses; 43:173-175.

Nelson, M, Wanjiru, W, Margret, MW., (2013). Prevalence of Vaginal Candidiasis; 1(10):447-452.

Nwokedi, EE, Aniyam, NN, (2003). A study of high vaginal swabs in Kano teaching hospital. A preliminary report, Highland Medical Research Journal 1: 57-61.

Nyirjesy, P, (2008). Vulvovaginal candidiasis and bacterial vaginosis. *Infect Dis. Clin North Am. 22(4):637-652.*

Shu'aibu, I, Ahmad, MM, Maigari, FU, Mu'inat, AA, and Abdullahi, II., (2016). Isolation and Antifungal Pattern of *Candida albicans* Isolated from Endocervical and High Vaginal Swabs of Pregnant Women Attending State Specialist Hospital Gombe, Nigeria. *Dutse Journal of Pure and Applied Scences 2(1), pp159-165.*