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# Prevalence of Vaginal Candidiasis among Pregnant Women Attending Federal University of Technology, Minna, Nigeria, Bosso Clinic

*[1]Oyewole OA, [2]Okoliegbe IN, [3]Alkhalil S, and [1]Isah P.

*[1]Department of Microbiology, Federal University of Technology, Minna, Nigeria.
[2]Department of Microbiology, University of Abuja, Nigeria
[3]College of Applied Medical Sciences, Alquwayiyah, Shagra University, Saudi Arabia

## ABSTRACT

The prevalence of vaginal candidiasis among pregnant women attending antenatal in Bosso clinic, Federal University of Technology, Minna, Nigeria was examined. A total of sixty (60) pregnant women were examined for a period of six months. Samples of high vaginal swabs were collected from each patient and processed using standard mycological methods. A total of 42 (70%) isolates were obtained which comprises five different *Candida* species, namely *Candida albicans*, *C. glabrata, C. tropicalis, C. krusei* and *C. pseudotropicalis* with frequency of occurrence of 21(50%), 9(21.4%), 6(14.3%), 5(11.9%) and 1(2.4%) respectively. The isolates obtained were related to number of pregnancy (gravidae), 25 (59.5%) were multi-gravidae while 17(40.5%) were primigravidae. Pregnant women in the second trimester of pregnancy had the highest incidence of candidiasis (61%), followed by third trimester (21.4%) while the least (16.7%) was obtained in first trimester. The isolates were also related to age, the age range of 21-30 years had the highest incidence (59.5%), followed by age range of 31-40 years (31.0%) and 15-20 years had the least (9.5%) percentage of occurrence. The results of this study revealed a high prevalence of vaginal candidiasis among pregnant women attending Bosso clinic, Federal University of Technology, Minna in the period of study.

**Keywords:** prevalence, antenatal, candidiasis, pregnancy, *Candida*, gravidae

***Corresponding author***

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## INTRODUCTION

Vaginal candidiasis is a fungal infection caused by overgrowth of *Candida* species affecting the genital tract as opportunistic pathogen. Vaginal candidiasis (VC) is a common type of vaginitis, a gynaecologic disorder with a white discharge, soreness, dyspareunia, irritation and itching. Vaginal candidiasis is a common complaint among women of different age groups, regardless of their sexual activities and can be possible risk for other diseases e.g. HIV/AIDS [1-4]. This infection progresses as colonization, superficial infection and hematogenous dissemination to different organ [2, 4-6]. Reports show that about 75% of all women, experience at least one episode of which physician approved to be candidiasis in their lifetime [4, 7, 8]. Vaginal candidiasis is a frequent companion of pregnancy, which greatly complicates the course of the pregnancy and jeopardizes the health of both mother and child [9]. The incidence of vaginal candidiasis is almost doubled (particularly in the second and third trimester) among pregnant women, due to high production or changes in the levels of sex hormones and deposition of glycogen in the vagina during pregnancy [10,11].

The common causative agent of vaginal candidiasis is *Candida albicans*, and occasionally are *C. glabrata, C. parapsilosis, C. krusei*, *C. pseudotropicalis, C. tropicalis*, and *C. dubliniensis* [5,12]. When *Candida* species e.g. *C. albicans* outgrows other friendly organisms in the genital tract, it disrupts the balance in the host as a result of response to the changes in the environment and becomes disease-causing pathogen [13]. This immune imbalance is caused by a number of factors, such as excess stress, allergies, indiscriminate use of antibiotics, steroids, birth control pills and hormonal drugs and nutrient deficiency [9,14]. Diabetes mellitus, pregnancy, and the use of tight nylon underwear also enhance overgrowth of *Candida* in a manner that cannot easily be controlled by the body's defence mechanisms [9, 15-18].

The aim of this research was to determine the prevalence of candidiasis among pregnant women attending the Bosso Clinic of the Federal University of Technology, Minna, Nigeria and to identify the species of *Candida* associated with candidiasis infection.

## MATERIALS AND METHODS

### Area of Study

This study was carried out within University Health Services, Federal University of Technology Minna, Nigeria.

### Sample Collection

This study was carried out from February 2012 to July 2012 in University Clinic, Bosso Campus. Sixty (60) samples of high vaginal swab were collected from asymptomatic and symptomatic pregnant women between the ages of sixteen to forty (16-40) years attending ante-natal clinic. Collection of vaginal swab was done by exposing the posterior fornix with a sterile vaginal speculum (Coscos),a sterile swab stick was then inserted to pick a high vaginal

swab. The swab stick was immediately replaced in its casing and labeled appropriately [8, 11, 14]. Two sets of swabs were collected from each patient. The samples were collected from both asymptomatic and symptomatic patients, labelled and taken to the microbiology laboratory of Federal University of Technology, Minna, Nigeria for analysis.

**Macroscopic examination of samples**

Each sample was examined for colour, appearance and odour and described as whitish or whitish-gray colour, cottage cheese-like discharge and odourless [19].

**Microbiological Analysis**

Each patient's sample was inoculated on Sabouraud dextrose agar plates and incubated at room temperature (25-30$^{o}$C) for 1-4 days [11]. Colonies differing in size, shape and colour were selected from the different plates and further subcultured on Sabouraud dextrose agar by the streak plate technique and incubated at room temperature (25-30$^{o}$C) for 24 hours after which, were maintained in agar slants for further characterization and identification. Colonial morphology, wet preparation, gram staining, germ tube test, chlamydospore formation (vesicle), and biochemical reactions were carried out for identification of the isolated organisms. Identification of each isolate was done by comparing the cultural, morphological and biochemical characteristics of each isolate with those of known taxa using the schemes of [20].

## RESULTS

**Incidence of Vaginal candidiasis among pregnant women**

Total of sixty (60) samples were collected for isolation and identification of *Candida* species from both symptomatic and asymptomatic pregnant women. Forty-two (42) of the 60 patients examined were positive, which gave an incident rate of 70% (Table 1).

**Table 1: Incidence of vaginal candidiasis among pregnant women**

| Samples | No of patient | Occurrence (%) |
|---|---|---|
| Positive | 42 | 70 |
| Negative | 18 | 30 |
| Total | 60 | 100 |

**The relation of isolate to the number of pregnancy (gravidae)**

Out of the forty (42) pregnant women found positive, 25 (59.5%) were multi-gravidae (women that have experience of more than one pregnancy) while 17 (40.5%) were primigravidae (women with first pregnancy) (Table 2).

**Table 2: The relation of isolate to the number of pregnancy (gravidae)**

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| Gravidae | No of patients | Percentage (%) |
|---|---|---|
| Primigravidae | 17 | 40.5 |
| Multigravidae | 25 | 59.5 |
| Total | 42 | 100 |

**Prevalence of *Candida* in relation to gestation age**

The prevalence of *Candida* was studied in relation to gestation (pregnancy) age. The highest occurrence of *Candida* was found in the second trimester (61%) followed by third trimester (21.4%) while the least occurrence was found in the first trimester (16.7%) as shown in Figure 1.

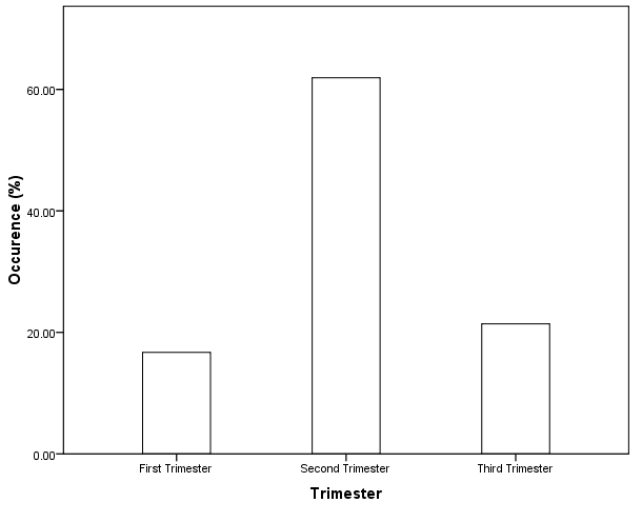


**Fig. 1: Prevalence of *Candida* in relation to gestation (pregnancy) age.**

**Distribution frequency of isolates in pregnant women**

Five *Candida* species were isolated from the pregnant women, namely, *C. albicans*, *C. glabrata, C. tropicalis, C. krusei* and *C. pseudotropicalis* with percentage occurrence of 50%, 21.4%, 14.3%, 11.9% and 2.4% respectively (Fig. 2).

**Distribution pattern of pregnant women by Age range**

The highest occurrence of *Candida* species (59.5%) was recorded between ages 21-30 followed by ages 31-40 with percentage occurrence of 31.0% while the lowest occurrence (9.5%) was recorded between age group 11-20 (Fig. 3).

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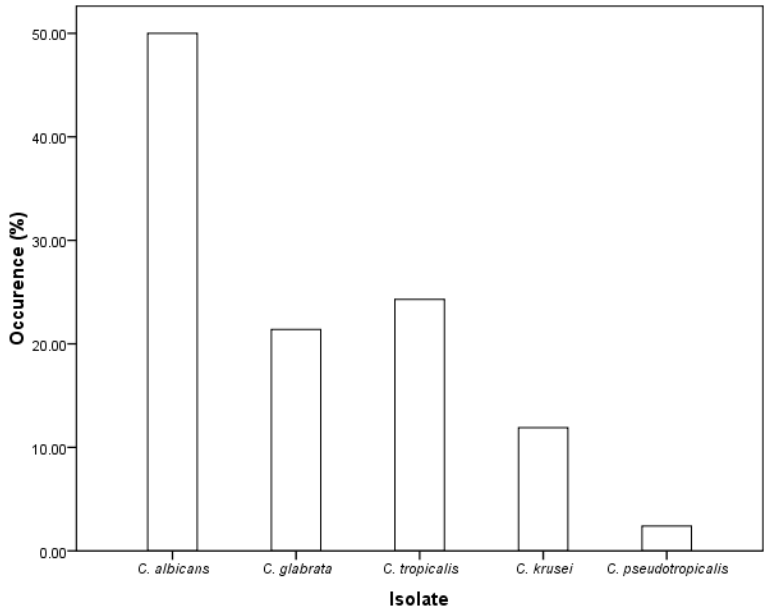


**Fig. 2: Distribution frequency of isolates in pregnant women**

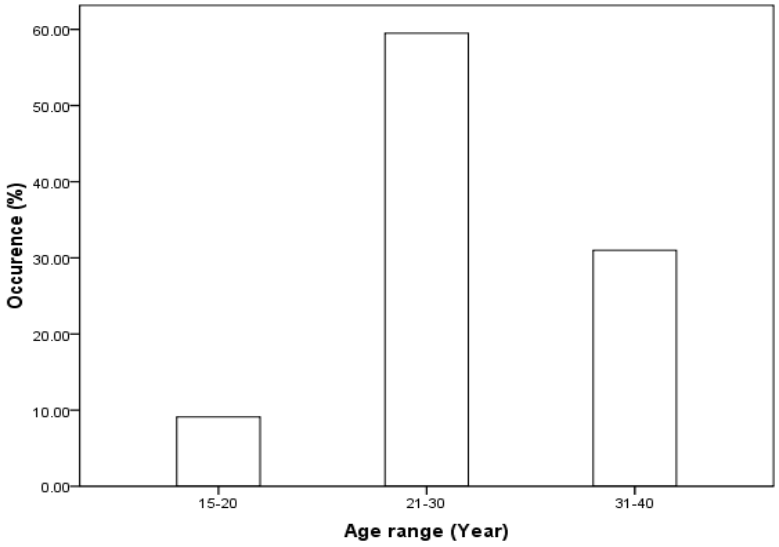


**Fig. 3: Distribution pattern of pregnant women by Age range**

## DISCUSSIONS

This study investigated the prevalence of vaginal candidiasis among pregnant women attending antenatal clinic over the period of six (6) months in Bosso clinic, Federal University of Technology (FUT), Minna, Nigeria. The study showed high prevalence (70%) of vaginal candidiasis among pregnant women. The high prevalence of candidiasis reported was similar to the findings of [3,8,21] who reported a prevalence rate of 60%, 62.2% and 67% respectively

among pregnant women in Jos and Enugu State, Nigeria. The finding is however in contrast to the observations of [15] who reported a frequency of 38%. The high prevalence of vaginal candidiasis among pregnant women attending antenatal clinic in FUT, Minna, Nigeria may be due 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 good and beneficial bacteria [10,22]. This high prevalence may result into the risk of miscarriage, premature birth, fetal oxygen deficiency, low birth weight and neonate mortality, wound infection after childbirth and systemic inflammation. Other possible risks include pelvic inflammatory disease, infertility, pelvic abscess, stress, discomfort and irritation.

Among the 70% pregnant women found to be positive with vaginal candidiasis, 40.5% were found to be privigravidae (women with first pregnancy) while 59.5% was found to be multigravidae (women that has experience of more than one pregnancy). This high prevalence among the multigravidae may be due to the use of contraceptive and antibiotics [3].This is similar to the findings of [23] who reported an occurrence of 60% among the multigravidae and 40% among privigravidae among pregnant women (patients) in Department of Pathology, Allama Igbal Medical College, Lahore- Pakistan.

Pregnant women in the second trimester had the highest occurrence of *Candida* infection 26 (61%) as revealed in the study. This agreed with earlier reports of [11,24]. This highest occurrence of *Candida* recorded in the second trimester may likely be as a result of fetal demand for nutrients.

*C. albicans* had the highest occurrence (50%), *C. glabrata* found next after *C. albicans* with 21.4% (9), *C. tropicalis* with 14.3% (6), *C. krusei* with 11.9 (5) and *C. pseudotropicalis* with 2.4% (1) in this study which is quite comparable with the reports of [25-27]. This is similar to the reports of [28] in India and [29] in Iran.

The high occurrence rate (50%) of *C. albicans* observed in this study as shown in figure 2 is an indication that it is a leading causative agent of the reproductive tract yeast infections in women of child bearing age as also observed by [12]. This may be due to its virulent factors which include dimorphism and phenotypic switching. *Candida albicans* produces protease and phosphatase which enhance its attachment to human epithelium. It can also be deduced that the high incidence rate of *C. albicans* could be due to increased physiological changes, estrogen and rich glycogen content of the vaginal mucosa thereby providing an adequate supply of utilizable sugar that favor its growth during pregnancy. However, Wise *et al*. [30] and Trofa *et al.* [31] reported a low occurence of *C. albicans* in New York. The low occurrence of *C. albicans* reported by Wise *et al*. [30] and Trofa *et al.* [31] may be as a result of good personal hygiene, appropriate nutrition, adequate diagnostic facilities and treatment.

The highest prevalence of vaginal infections in this study was noted among the age groups 21–30 years 25 (59.5%), followed by 31–40 age group 13 (31.0%). This report agreed with [32], which reported a peak vaginal infections between age group 20 and 40. This may be

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

## CONCLUSIONS

The results of this study showed a high occurrence of *Candida* among pregnant women attending Federal University of Technology, Minna, Nigeria Bosso clinic. *C. albicans* was the most prevalent among the isolates. There was a high prevalence of vaginal candidiasis among multi-gravidae, women at the second trimester and those between age group 21 and 30.

## RECOMMENDATIONS

1. Early diagnosis and adequate treatment of vaginal candidiasis should be practiced.
2. The need for regular check-up at different gestation period should be encouraged.
3. The use of loose-fitting and natural fibre under wear and avoidance of topical irritants or deodorants.
4. Drug abuse among preganant women should be discouraged

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