



Urogenital Candidiasis among Women in Northcentral and Southeast Nigeria: A Review

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Abstract

Background: Urogenital candidiasis as one of diseases that affects the private parts of women, is associated with social and psychological unease in the affected women. Due to its nature, it tends to be worse before disclosing to any other person, there by leading to serious consequences. **Aim:** The review aimed to identify the burden of this disease in two subregions (North Central and South Eastern Nigeria). **Methodology:** Documented data on this disease from the studied regions was obtained using different search engines, like google scholar, ask.com and other literature sources. **Results:** Available data published on this disease from the studied regions were obtained, and this suggest that urogenital candidiasis covers wide range of ages, but the mostly at risk groups include was shown to be age range of 19-30 years, across the two regions reviewed. The review also indicated that, HIV patients are another category of at risk group affected by the disease. It was also found that women that normally wear nylon underwear are at more risk than those who wear cotton pants, because the earlier traps more heat and moisture than the later. More so, those who wear skin tight, even if, is not nylon type, are at another risk of the disease according to the review. Pregnant women and those who use intrauterine contraceptives with high estrogen content are also shown to be more vulnerable. Symptoms of the disease were found to be itching and whitish discharge from the vagina. **Conclusion:** It could be concluded from the review that, women of the Northeast and Northeastern Nigeria also suffers the burden of candidiasis as found in other regions of the world.

Key words: *Urogenital candidiasis, North Central, SouthEastern, Nigeria, Burden*

Introduction

Vulvovaginal candidiasis (VVC), is an opportunistic infection that affects the urogenital region of women especially in the event of immunosuppression, it is caused by *Candida* species and is one of the uncomfortable situation women finds themselves.

Apart from *C. albicans* that is believed to be the major cause VVC, other *Candida* species also leads to repeated infection and the organisms tend not to respond adequately to

the commonly used drugs. According to Nwadioha and colleagues in 2013, *C. albicans* were responsible for 69% of positive results from high vaginal swab (HVS) specimen used in their study (Nwadioha *et al.*, 2013), also in Maiduguri, Ibrahim and his co-workers found a prevalence of 41% from antenatal care clinic attendees (Ibrahim *et al.*, 2013).

In a work from Anambra state-Nigeria, Okonkwo, reported on vulvovaginal

candidiasis prevalence rate, among women of different socioeconomic status in Nnewi(Okonkwo, 2010). Pregnant women are normally more prone to vaginitis and vaginal colonization by yeast when compared to the non-pregnant ones due to high glycogen content resulting from the accumulation of reproductive hormones, in which the glycogen gives carbon source to the yeast (Dennerstein and Ellis2001). High estrogen content oral contraceptives tend to increase vaginal colonization with *Candida* species(Tarry *et al.*,2005). Use of intrauterine contraceptive devices is shown to have increased effects of yeast carriage rate and things like Diaphragms, contraceptive sponges, and condoms, with or without spermicides are inclusive (Reed *et al.*, 2003).

The yeasts are effectively identified as fungi that grow as single-cell organisms that reproduce by budding. Their various species are differentiated on the basis of the mechanism of daughter formation, size and shape, the presence or absence of capsules, the formation of true hyphae or pseudohyphae, and the presence or absence of sexual spores, in addition to biochemical tests used (Banerjee *et al.*, 1991), *C. albicans* is the predominant causative agent of all forms of mucocutaneous candidiasis. Other *Candida* species that are sometimes involved includes. *glabrata*, *C.parapsilosis*, *C. tropicalis*, *C. krusei*, and other species may also cause disease.

Among the various *Candida* species, *C. dubliniensis*, is the species phenotypically similar to *C. albicans*, which may be the cause of approximately 15% of infections that were thought to be due to *C.albicans*, these*Candida* species, although often found as commensal organisms in some parts of the body, (digestive tract, respiratory tract and urogenital tract) of healthy individuals, they produce a wide range of illnesses among immunocompromised people and this problem is on the rise (Banerjee *et al.*, 1991). Normally, there are two main forms of candidiasis:(i) The mucosal and (ii) The disseminated

candidiasis. Mucosal candidiasis, in the form of oral, vaginal or oesophageal infections, common in HIV/AIDS infected individuals. As found with other opportunistic infections in human, the introduction of highly active antiretroviral therapy (HAART) helps to reduce the incidence of oral and oesophageal candidiasis among other yeast infection (Mocroft *et al.*, 2005).

It was reported that the incidence of oral candidiasis in HIV infection varies from 7% to 93%, depending on various factors, like patients condition, diagnostic criteria and so on. In a study on some HIV-infected women, the prevalence of vaginal candidiasis and oral candidiasis were found to be 28% and 9% respectively. Although in the early stage of HIV-infected women, Candidavaginitis is normally the commonest clinical presentation, the infections tend to persist and are associated with a lower CD4count and higher HIV viral load (Duerr *et al.*, 2005).

Candida species especially*Calbicans* proved to be opportunistic fungal pathogen responsible for candidiasis in the human (Sundberg *et al.*, 2013), and according to records, *Candida* species are part of the lower genital tract flora in up to 20-50% of healthy asymptomatic women (Kanagalet *et al.*, 2014).

While 50% of women suffer the recurrent incidence of VVC, it was noted that about 75% of them experience at least one episode of the disease in their lifetime. In most times candidiasis is linked to the production of watery, odourless,thick-white and curd-like discharge from the vagina, this normally is accompanied with vulvovaginal inflammation and itching, also the carriage rates of the agent *C. albicans* are higher in diabetic and pregnant women, those with HIV/AIDS and the women treated with broad-spectrum antibiotics, also *Candida* infections favours warm and moist parts of the body, as is also associated with clothing that is made of nylon materials that can trap heat and moisture or the one that is too tight even if is not nylon (Aher, 2014).

Corticosteroids administration, poor personal hygiene, use of immunosuppressive drugs and immune deficiencies, as well as vitamin B deficiencies are some of the predisposing factors (Onianwah, 2014). The vaginal microbial flora is affected by fluctuating interactions between them and *Lactobacillus acidophilus* and between them and other endogenous flora and between them and other factors. *L. acidophilus* produces hydrogen peroxide (as a by-product of metabolism), this keeps the healthy vaginal pH acidic at the same time toxic to the pathogens. Vaginitis also occurs when the vaginal microflora has been altered by invading pathogens or biochemical changes in the vaginal environment (Sobel *et al.*, 1998).

As usual, vaginal discharge is a common symptom associated with genital tract infection in women, but identifying the cause is usually so challenging because many pathogens may be responsible or several infections may exist at the same time. Vulvovaginal candidiasis, for example, is an inflammation of the vulva and or the vaginal region due to the presence of actively multiplying *Candida* species, but in the absence of any other causative agent and is believed to be second to bacterial vaginosis as the aetiology of vaginitis all over the world (Kumari *et al.*, 2013).

The signs and symptoms include a cheese-like discharge associated with vulva and vaginal burning sensation, pruritus, erythema and pain among other symptoms and may cause difficulties in intercourse. Vaginal pH maybe somehow normal and budding yeast cells and pseudohyphae may be traced on wet-mount, but an asymptomatic prevalence of 10% of women has been documented (Pirota and Garl, 2006). The generated symptoms of vaginal candidiasis are known to be due to the overgrowth of the yeast and the ability to penetrate the vulvovaginal epithelial cells (Apalataet *et al.*, 2014).

The genital tract is an entry route, for numerous sexually and non-sexually transmitted disease agents. The different kinds of organisms that normally affect the female reproductive tract usually lead to vaginal discharge. *Candida albicans* is the most frequently isolated invasive fungal pathogen in humans, with most infections being localized to the urogenital or oropharyngeal tracts of the patient (Fidel, 1996). In addition to localized infections, *C. albicans* is also able to establish a systemic infection in its host. Vaginal candidiasis is a common gynaecological problem among women of childbearing age worldwide (Anderson *et al.*, 2004).

Vulvovaginal candidiasis is one of the genitourinary candidiasis (fungal infection) of the genital and urinary tracts caused by *Candida* species in women, candiduria is also another problem associated to these agents (Lisboa *et al.*, 2009). *Candida* species are normal microbiota of the gastrointestinal tract, respiratory tract, mouth, and vagina, and they usually lead to opportunistic infections when host defense is negatively affected, and this helps the fungus to proliferate. Sexual contacts, bladder emptying, poor genital hygiene and urinary obstruction are some of the risk factors associated with genitourinary candidiasis (Marin *et al.*, 2000). Despite the fact that genitourinary candidiasis is evident in both immunocompromised and immunocompetent individuals, it is mostly a cause of morbidity and mortality especially in immunocompromised individuals (Achkar, *et al.*, 2010).

Available records suggested that genitourinary candidiasis incidence varied with respect to host susceptibility, sex and other factors and is found to be more in women, especially pregnant ones and among hospitalized patients, particularly in an intensive care unit (ICU) and burning incidence units (Bougnouxet *et al.*, 2008), The *Candida* species. Has different presentation with different diagnostic procedures as can be in fig 1.

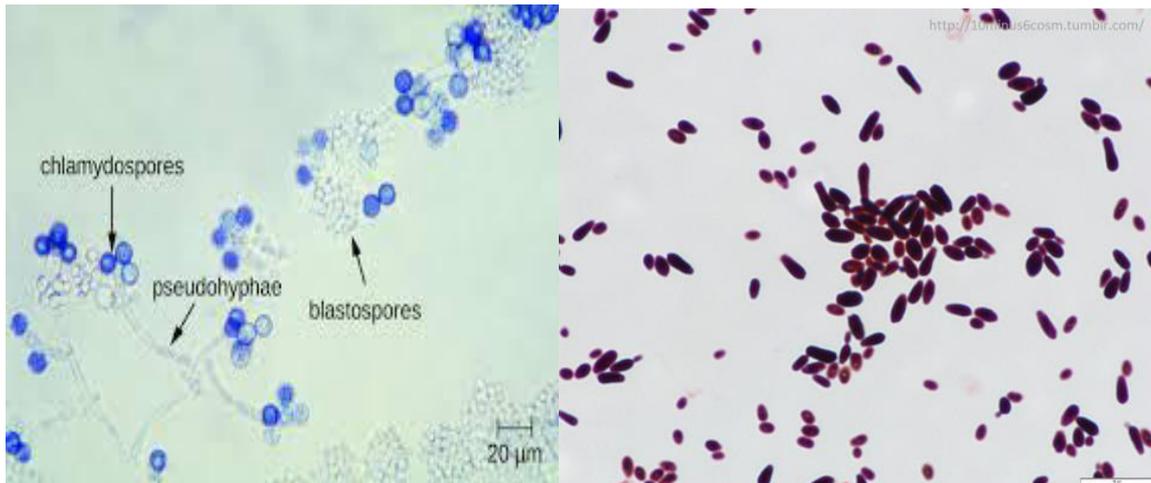


Figure 1: Some identification features of candida species Tuyenlab, 2015

Figure 2: Gram's stain smear with a different appearance of Candida species; Microcosm, 2016

NorthCentral Nigeria

Nwadioha *et al.* (2010) in Jos, Plateau State, Nigeria, reported 420 *Candida* species making a prevalence of 60% of the 700 female genital tract discharge etiologies from 1000 female genital tract samples used. Based on the result, in the age group of 0-10 years 5(1.0%) of the 420 candida species were isolated, 11-20 years age bracket had 103(24.5%) of the detected *Candida* species while 21-30 years age limit was represented by 180(43.0%) *Candida* species isolated, other age groups: 31-40, 41-50, 51-60 had their prevalence rates as 100(24.0%), 30(7.0%), and 2(0.50%) respectively. The highest age group at risk was found to be 21-30 years of age, with 180(43.0%) as their prevalence rate. According to the findings also, 20 genital samples had multiple isolates and pregnant women represent up to 40% of the total 420 cases identified.

In Benue state-Nigeria, Umeh and Umeakanne, (2010) reported the rate of yeast infection among HIV positive women. according to them, the overall prevalence of candida infection, HIV infection, and HIV/Candida infection were found to be 22.7% (n = 510), 65.5% (n = 510) and 20.2% (n = 510) respectively. The result also revealed that 88.8% of women infected with HIV also had a yeast infection, on the other hand, 58.6% of those that were HIV

seronegative had the infection with *Candida* species.

With regards to pregnancy, 30 (20.5%) of 146 pregnant women were infected with the yeast species; and among them, all i.e (100%) those that were found HIV positive had a yeast infection, while only 15.3% of the pregnant women that were HIV negative had the yeast infection.

In a study in plateau state-Nigeria, a prevalence of 29.1% (n = 2458) of *Candida* species was obtained, in a retrospective study that covered 8443 HVS/ECS results in Jombo *et al.* (2010). Isolation rates based on age groups indicated that no single isolated was recovered from the age range of 9 years and below, age limit of 10-19, had 7.5% while, 30.0%, 33.0%, 35.2%, 25.5%, and 18.8% were for the age groups of 20-29, 30-39, 40-49, 50-59, and 60 and above, *Candida* infection rates respectively. Different pathologies are associated with *Candida* infection of the urogenital tract as highlighted by figures 3 and 4.

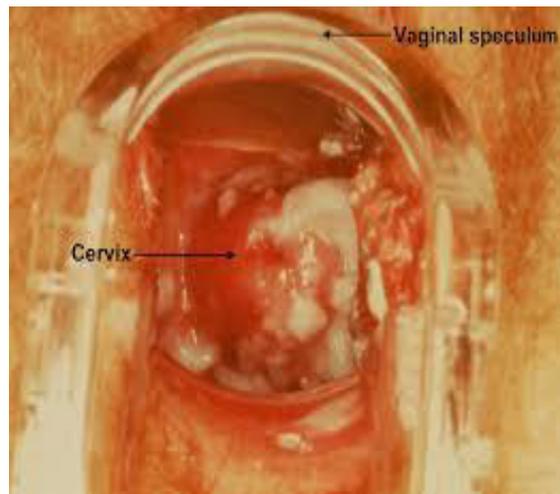


Figure 3: Vaginal Candidiasis Mikael, 2014;

Figure 4: Effect of the disease reaching the cervix; Rebecca et al., 2017

South-Eastern Nigeria

In Imo state-Nigeria, a hostel based study on students, in Imo state southeastern Nigeria Chijioke *et al.* (2016) revealed variable prevalence, in which, out of 284 participants enrolled, *Candida* spp, particularly *C. albicans* carriage was found among 107 of them, resulting in the total prevalence of 37.7%. The result displayed even distribution of the rate of prevalence across the six hostels. The age limit of 23-25 years had the highest prevalence rate of 45.0%, while the lowest prevalence of 20.6% was observed in the age group of 17-19 years of age.

According to the result, most of the students found positive for *Candida* species from their HVS samples, were those that normally use tight and nylon underwear (18.7%) as against those that wear cotton pants (7.0%). It was also discovered that 15.5% of the student positive of the organism were vaginal douche users. Among the students that use water closet by squatting on it, 16.9% of them were also positive for the *C. albicans* carriage. The prevalence rate of 30% and 1.8% was observed among those who use the relatively dirty toilet and those who use a clean one.

A report on VVC of 209 women in Enugu state-Nigeria revealed 65(31.1) of them had symptoms of VVC like itching and whitish discharge from the vagina, among them, 54(25.8%) had a clinical based diagnosis of the disease while 155(74.25%) had not. Among them also, 43(20.6%) had laboratory culture diagnosis, of which 37(17.7%) had symptoms while 6(2.9%) had none. Aniebue *et al.* (2018). The real prevalence of VVC based on those that had symptoms and had culture-positive results was 17.7%; while asymptomatic *Candida* colonization was 2.9%. The result further indicated that only 26 (12.4%) of those with clinical-based diagnosis were positive for laboratory culture of *Candida* species. They also discovered that 11 (false negative) of 37 culture-positive cases with symptoms were missed, based on clinical-based diagnosis, while 28 (false positive) of the 54 clinical-based diagnosis of the VVC, were not confirmed by laboratory cultures.

In 2015, a documented work by Ezeigbo, *et al.* (2015), reported on the prevalence of *candida albicans* in pregnant women, in Abia State, Nigeria. According to the findings, the age-related prevalence revealed that: 48(39.7%) was the highest prevalence observed and was

found in the age group 19-28 while 23(26.7%) was the least prevalence and was obtained in the age bracket of ≥ 49 years of age. The results also indicated that vaginal infection among the study population was associated with some parameters like level of the trimester, occupation, and educational status. The prevalence of candidiasis in relation to trimester among the pregnant women revealed that the highest prevalence was associated with pregnant women at their third trimester while the least prevalence was recorded in relation to pregnant women at their first trimester. It was also evident that the rate of infection increased as the time of pregnancy (trimester) increased. The prevalence of the candidiasis in relation to educational status showed that the illiterate pregnant women recorded the highest prevalence with 22(47.8%) while those that attained the tertiary level of education had the least prevalence rate with 33(23.2%). The prevalence of candidiasis in relation to occupation also showed that traders recorded the highest prevalence of 76 (47.8%) while the housewives end up with the least prevalence rate 8(8.3%).

Conclusion: It could be concluded from the review that, women of the northcentral and northeastern Nigeria also suffer the burden of candidiasis as found in other regions of the world, which is a course for concern for the health personnel and policymakers in the two regions.

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