

Full Length Research Paper

Symptomatic vulvovaginal candidiasis and genital colonization by *Candida* species in Nigeria

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Vulvovaginal candidiasis is a common clinical finding among women especially the sexually active group, even though there has been a sustained increase in both the variety and potency of antifungal drugs over the past three decades. The disease apparently appears not to have sufficiently yielded to these breakthroughs nevertheless. The study was therefore set up to ascertain the prevalence of vaginal candidiasis among women in Jos. The study was retrospective in nature: Data generated from analysis of endocervical and high vaginal swab (ECS/HVS) specimens by the Microbiology laboratory of Jos University Teaching Hospital (JUTH) for a period of five years (July 1999 - June 2004) was compiled. Samples were collected, transported, stored and processed using standard laboratory procedures. Additional information was obtained from patients' case notes in the records department. Results were analyzed using Epi Info 6 statistical software. The prevalence of *Candida* infection was found to be 29.1% (n = 2458); no isolate was recovered from those less than 10 years of age, while the peak age-group of infection was 30 - 39 years 11.8% (n = 997); the age-group 20 - 49 years accounted for over 25% of the entire infections. Common clinical manifestations were: Nil symptoms, 24.7% (n = 607); itching and rashes, 29.4% (n = 723). Due to the importance of the results, sex education workshops should be conducted for adolescents and young adults in order to educate them on the clinical importance of candidal infections.

Key words: *Candida* species, colonization, female, vaginal.

INTRODUCTION

Vaginal candidiasis is a common gynaecological finding among women worldwide (Anderson et al., 2004; Naglik et al., 2003). It has been found that up to 75% of the sexually active women have, at least, at a time experienced symptomatic vaginal candidiasis (Schroppei et al., 1994; Lisiak et al., 2003). The commonest organism implicated is *Candida albicans* (Simoes et al., 1998; Da Rosa and Rimel, 2004; Kent, 1991; Ferrer, 2000), and the predisposing factors include: Hormonal fluctuations as in pregnancy, luteal phase of menstrual cycle, use of oral contraceptives, and hormone

replacement therapy among others (Geiger et al., 1995; Sobel et al., 1998). Up to 10% of women do not have obvious predisposing factors and yet present as well with the recurrent type (Foxman, 1990; Ringdahi, 2000). There are however as of now, several reports implicating symptomatic vulvovaginal candidiasis and increase in rate of transmission and spread of HIV infection in several parts of sub-saharan Africa and beyond (Bingham, 1999; Desruisseau et al., 2009; Hilber et al., 2010; Guthrie et al., 2009).

Generally, women are said to be present with clinical symptoms of vulvovaginal candidiasis when the high vaginal yeast count is greater or equal to 10^5 CFU/ml of vaginal fluid (Carlson et al., 2000). Symptoms generally include: Itching, burning, soreness, abnormal vaginal discharge, and dyspareunia (Barousse et al., 2005).

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Findings from 106 women with vaginitis in Nicaragua showed that over 70% of them were infected with yeast-like organisms, while *C. albicans*, *Candida tropicalis*, *Candida glabrata* and *Candida krusei* accounted for 59, 23, 14, and 4%, respectively of the yeasts recovered (Bello et al., 2002). In Malaysia, isolates of *Candida* were recovered from over 54% of patients from two groups: Non *C. albicans* species were commoner in patients with recurrent vaginal candidiasis compared to those with only one episode per year (Chong et al., 2003). Six yeast species were detected which include: *C. albicans*, *C. glabrata*, *C. lusitanae*, *C. famata*, *C. Krusei*, and *C. parapsilosis* (Chong et al., 2003). Elsewhere in Australia, a trial of oral or vaginal forms of Lactobacillus to prevent post-antibiotic vulvovaginitis failed to yield the desired results (Pirota et al., 2004).

In Nigeria, Nwosu in a study on patients with AIDS from 3 private medical laboratories reported vaginal candidiasis in 34.8% as the commonest genital infection (Nwosu et al., 2001); Oyelese in Ile-Ife from a review of findings from an STI clinic reported *C. albicans* in 24% of the patients and also as the commonest agent of sexually transmitted infections (STIs) encountered (Oyelese et al., 2005); and Akerele in Benin-city from a study on antenatal women established *C. albicans* in 65% of the women and also as the commonest genital infectious agent encountered (Akerele et al., 2002).

The sexual transmission of *Candida spp.* has well been documented (Msuya et al., 2002; Namkinga et al., 2005; Tesfaye et al., 2000) its near absence in virgins, and the high frequency in the most sexually active women further deepens the contribution of the organism in the epidemiology and control of sexually transmitted diseases (STDs) (WHO, 2001; Hart, 1993). An understanding of the impact and spread of *Candida* infections among women in a locality will be of immense benefit in the management of gynaecological problems with similar or closely related presentations especially in the symptomatic cases (Spinillo et al., 1995; Sobel, 1990). It would also constitute a guide towards assessing the depth of other sexually transmitted infections in the community, and hence their control.

MATERIALS AND METHODS

Setting

The study was carried out at the Microbiology laboratory of the Jos University Teaching Hospital (JUTH) Jos, Plateau state North central Nigeria. The study was retrospective in nature. The data generated by the genital section of the Microbiology laboratory of JUTH from endocervical swabs (ECS) and high vaginal swabs (HVS) was compiled for a period of five years (July 1999 to June 2004). Samples were collected, transported, stored and processed using standard laboratory procedures (Cheesbrough, 1987; Milne, 1989). Sabouraud dextrose agar medium was used for the growth of *Candida* species. Additional information was obtained from patients' hospital records. *Candida spp.* were identified based on the following features: On Sabouraud agar medium, appeared

as-pasty, opaque, pale coloured colonies often with a sweet smell reminiscent of ripe apples, gram positive but averagely larger than cocci (Milne, 1989). Data obtained was analysed using simple descriptive methods and correlation coefficient where applicable (Onyeka, 1992). Ethical approval for the study was obtained from the ethical committee of Jos University Teaching Hospital.

RESULTS

The rate of isolation of *Candida spp.* from the genital samples was 29.1% (n = 2458) out of the 8443 HVS/ECS specimens processed during the study period, (Figure 1).

Based on age distribution and rate of isolation of *Candida spp.* from female genital specimens: No isolate (0%) was recovered from those nine years and below; 7.5% (n = 43) from 10 - 19 years old; 30.0% (n = 667) from those 20 - 29 years old, and 33.0% (n = 997) from those 30 - 39 years old. Those 40 - 49, 50 - 59, and 60 and above years old had 35.2% (n = 463), 25.5% (n = 182), and 18.8% (n = 84) respectively rate of *Candida* infections (RR = 2.8, CI = 3.5 - 4.6) (Table 1).

Analysis of clinical features associated with isolation of *Candida spp.* from female genital specimens showed that: Those with no symptoms were 24.7% (n = 607), itching and rashes, 29.4% (n = 723), discharge only, 18.0% (n = 442), and rashes only, 15.8% (n = 114).

DISCUSSION

The rate of detection of *Candida spp.* from HVS/ECS specimens was found to be 29.1% (n = 2458) in Jos. This finding compares well with that of Ekwempu in Zaria, who reported a Candidal prevalence of 20.9% among women in labour (Ekwempu et al., 1981); Bello in Nicaragua who reported a much higher figure of 41% among women with, understandably vaginitis (Bello et al., 2002), and Oyelese in Ile-Ife, Nigeria, who reported a prevalence of 24% *C. albicans* among STDs over a 10 years period (Oyelese et al., 2005).

Proper sex education of teenagers, adolescents and young adults could be useful in the control of vaginal candidiasis, even though the exclusive sexual transmission of the organism is yet to be endorsed (Barousse et al., 2004; Eckert et al., 1998; Ononge et al., 2005). However, its near absence in the very young age groups and its high incidence in the most sexually active age range further strengthens the belief that sexual activity could contribute to a large extent, the spread of the disease (Ononge et al., 2005). The exceptionally high prevalence of vulvovaginal candidiasis among commercial sex workers further affirms the impact of unsafe sexual activity on the burden of the disease (Zhou et al., 2009; Huong et al., 2009; Aboud et al., 2008).

The observed strong association between vaginitis and vaginosis and transmissibility of HIV in Switzerland (Hilber et al., 2010); the high HIV seropositivity among fertile women with symptomatic candidiasis in Cameroon

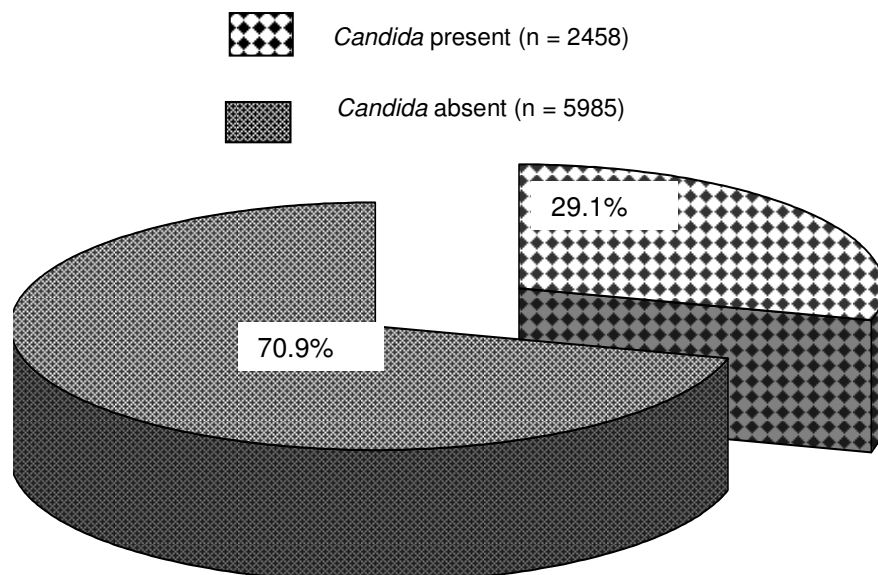


Figure 1. Rate of isolation of *Candida* species from female genital specimens in Jos, North central Nigeria.

Table 1. Age distribution and rate of isolation of *Candida* spp. from female genital specimens in Jos, North central Nigeria (N = 8443).

Age (Years)	<i>Candida</i> present (%)	<i>Candida</i> absent (%)	Total (%)
1 - 9	0 (0)	29 (100)	29 (100)
10 - 19	43 (7.5)	535 (92.5)	578 (100)
20 - 29	667 (30.0)	1563 (70.0)	2230 (100)
30 - 39	997 (33.0)	2021 (67.0)	3018 (100)
40 - 49	463 (35.2)	852 (64.8)	1315 (100)
50 - 59	182 (25.5)	532 (74.5)	714 (100)
60 and above	84 (18.8)	363 (81.2)	447 (100)
Unclassified	22 (19.6)	90 (80.4)	112 (100)

RR = 2.8, CI = 3.5 - 4.6.

(Desruisseau et al., 2009); the increasing symptomatic vaginal candidiasis from women post antibiotic treatment with higher rates of contracting HIV in Melbourne, Australia (Priotta and Garland, 2006); and the high rates of HIV and candidiasis among youths and adolescents in Dar es Salaam, Tanzania (Chalamilla et al., 2006) all points to the medical importance of candidiasis.

In view of the high prevalence of symptomatic vulvovaginal candidiasis in the present study and the probable association with the increase in rate of transmission of sexually transmitted infections including HIV; women should be adequately health educated on the need for prompt and timely investigations and treatment of all urogenital symptoms (Anderson et al., 2008; Heikinheimo and Lahteenmaki, 2008; Vermitsky et al., 2008). This would help in the control of candidiasis as well as other agents of STDs (Lowndes et al., 2000; Alary et al., 2002). The age with the highest infection rate with candidiasis

was 20 - 49 years; this coincides with the period of maximum sexual activity (RR = 2.8, CI = 3.5 - 4.6). The prevalence of vaginal candidiasis generally increased with age, and cumulative years of sexual exposure may as well be a contributory factor to this trend, although the hormonal influence may not be ruled out. This finding was similarly reported by Msuya in Moshi, Tanzania, where the peak of STD among the women studied was slightly above 30 years (Msuya et al., 2002). Being the most productive and active age of any society, proper and timely control and treatment of STDs would reduce the morbidity and sequelae thereafter. The overall impact would be a decrease in the man hour loss and increase in productivity (Grosskurth et al., 1995).

All STDs need to be properly investigated and treated, since infection with one agent generally increases the chances of infection subsequently with other agents STD (Ryan et al., 1998; Trebucq et al., 1994). *Candida* spp.

infection with symptoms or none has commonly been detected along side *Mycoplasma hominis*, *Ureaplasma urealyticum*, *Chlamydia trachomatis*, and *Trichomonas vaginalis* (CDC, 1998; Kirsch et al., 1998; Beltrami et al., 1997). Hence such organisms should be looked up for in detection of both symptomatic and asymptomatic vaginal candidiasis (Dallabetta et al., 1998).

More sensitive diagnostic methods should be deployed to the nation's laboratories, such as: Amplified polymorphic DNA methods, and Oricult-N Dipslide. These would reduce the incidence of false negatives often encountered in the course of application of the traditional diagnostic methods based on culture and gram staining. In conclusion, symptomatic vaginal candidiasis was found to be high especially among the most sexually active age range. Women should be adequately educated on the need to seek medical attention on early onset of genital symptoms for prompt and timely treatment. This would no doubt reduce the prevalence of candidiasis as well as other sexually transmissible diseases including HIV.

This study being a retrospective study is limited by the fact that some medico-social associated factors such as intake of oral contraceptive pills or other forms of family planning methods, sexual history, serostatus of HIV as well as presence or otherwise of pregnancy could not be ascertained with measurable certainty. These limitations are however well noted although the study has been able to present the level of overall burden of the disease.

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