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Full Length Research Paper

Symptomatic urogenital candidiasis and therapeutic management on women taking oral contraceptive pills

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The use of oral contraceptive pills are increasingly becoming popular among women in both urban and rural Nigerian settings, and its perceived association with gynaecologic infections not withstanding. This study was therefore carried out to ascertain the rate of urogenital candidiasis among women on oral contraceptive pills (OCP) in Gboko town. All the willing women on OCP attending family planning clinic and Comprehensive health centre in Gboko were consecutively recruited in the month of September, 2009. Questionnaires were used to obtain relevant data such as age, marital status, occupation and urogenital symptoms. Urine, high vaginal swab and endocervical swab specimens were subsequently collected, transported and processed for isolation of microorganisms using standard laboratory procedures. The rate of urogenital candidiasis among the 153 women on OCP was significantly higher 36.5% compared to the control 20.3% (P < 0.05) in as much as their general knowledge about the disease was poor; similarly, genitourinary symptoms were recorded in 22.2% of the women on OCP as compared to the 5.2% in the control group (P < 0.001) and was significantly higher among the singles, separated, widowed and divorced (64.4 to 64.7%) compared to the married 27% (P < 0.05). 79.4% of the symptomatic infections were caused by *Candida species*. Women should be properly counselled and health educated on the need for prompt and adequate treatment of vulvovaginal candidiasis while facilities for appropriate treatment and proper laboratory diagnosis provided.

Key words: Candidiasis, contraceptive pills, oral, urogenital, women.

INTRODUCTION

Candidiasis is a fungal infection caused by *Candida species* of which *Candida albicans, Candida glabrata, Candida lusitaniae, Candida famala, Candida krusei. Candida africanus* and *Candida parapsilosis* are the most common species of medical importance (Chong et al., 2003; Fidel et al., 1999). There are no doubt divided opinions among scholars as to the exact grouping of Candida whether it is a commensal or an outright infectious agent sine it can remain harmless for long periods and in other instance cause clinical disease in the same individuals. Some of the common diseases caused by Candida species are oral candidiasis, pharyngeal candidiasis, oropharyngial candidiasis, disseminated candidiasis, candidal meningitis, pelvic inflammatory disease and vulvovaginal candidiasis (Lanchares and Harnandez, 2000; Marco et al., 1999). The organism responds well to drugs such as fluconazole, itraconazole, amphotericin B, and clortrimazole (Ringdahl, 2000).

Genital colonization by *Candida species* among adult women is generally not a curious clinical finding (WHO, 2001; Da Rosa and Rimel, 2004 and Monif, 2001). This

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is due to the fact that the organism often presents with no obvious clinical symptoms in the reproductive tract of a large segment of adult women harbouring it (Eckert et al, 1998; Sobel et al., 1998). The near zero rate of urogenital colonization by *Candida* spp. in females less than 10 years old and the significantly higher figures in the most frequently sexually active women, and the directly or indirectly associated diseases with the organism makes it presently of high clinical value (Lawn et al., 200; Anderson et al., 2004; Carr et al., 2005).

At least 75% of all adult women would experience an episode of symptomatic urogenital candidiasis in their life time which usually occurs whenever *Candida* spp. have grown beyond a certain threshold in the genital region. This may present in form of itching, discharge, painful micturition or urinary frequency and in extreme cases as low abdominal pain and waist pain. Since the advent of human immunodeficiency virus (HIV) infection in 1982, subsequent research findings have repeatedly linked increased rate of transmissibility of the virus among women with prior gynaecological diseases such as sexually transmitted diseases (STDs) including vaginal candidiasis (Warszawski et al., 1996; Biggs and Williams, 2009; Kemal et al., 2003). This implies proper control of Candidiasis would in turn impact positively in reducing the rate of spread of HIV AIDS which is still presently an epidemic on the African landscape (Nyindo, 2005).

With the current increase in the level of awareness on reproductive health globally, and the desire of families to regulate their family sizes for a more healthy family life, more women have increasingly taken to various contraceptive use (Prasad et al., 2005; Younis 1993; Finner et al., 1993). Varying reports have trailed the use of oral contraceptive pills (OCP) especially from the microbiological point of view from lack of significant association to strong association (Fitzgerald et al., 2007; Loh and Sivalingam, 2003 Bello et al., 2002). It is in the light of these mixed reports about women on OCP that the rate of symptomatic urogenital candidiasis among women on oral contraceptive pills in a Nigerian town was carried out (Moi, 1990; Wang and Lin, 1995). The findings would be useful as a guide to health professionals during counselling and follow up of such and related clients. This forms the basis for the present study.

MATERIALS AND METHODS

Setting

The study was carried out September 2009 in Gboko town, arguably the second largest town in Benues state situated about 82 km north-east of Makurdi State Capital. Based on 2006 population census, the town has an estimated population of 300,000 people; over 95% of the population is made up of Tiv people who are predominantly farmers by occupation and Christians by religion. Two major health centres- General hospital (GH) and Government comprehensive health centre (GCH) centre are located in the town which serves the health needs of most of her inhabitants.

Procedure

Women attending family planning clinic at GH and GCH centre were recruited into the study. Pre- tested questionnaires were administered either self or interviewer to the respondents to obtain relevant information. These include age, marital status, occupation, and educational level, knowledge about candidiasis and presence or absence of genitourinary symptoms.

All the women who volunteered to enrol in the study were consecutively recruited into the study throughout the study period. This comprises 91 women from GH and 62 from GCH. Pre-enrolment briefing about the study was carried out for each participant then informed written or oral consent obtained from them. A control group, age matched was drawn from apparently healthy women attending the GCH centre for other reasons other than family planning and who were not on oral contraceptive pills.

Sample collection and processing

High vaginal swab (HVS), endocervical swab (ECS) and urine specimens were collected from both the test and control subjects using standard laboratory procedures and transported to the GH Gboko laboratory within one hour of collection. Wet preparations were carried out on the specimens and examined microscopically using X40 objective lens while urine specimens were centrifuged at 3000 revolutions per minute (RPM) for five minutes and the sediments further examined microscopically (Cheesbrough, 1978). The specimens were inoculated on Sabouraud's dextrose agar, chocolate, blood agar, macconkey agar and cystein lactose electrolyte deficient (CLED) agar and incubated overnight at 36.5 $^{\circ}$C. *Candida species* were identified based on cultural characteristics, gram stain and cell morphology, and biochemical properties using germ tube test, chlamydospore formation test and carbohydrate fermentation (Cheesbrough, 1978; Mackie et al., 1987). Bacteria were identified using relevant and appropriate biochemical tests such as catalase test, oxidase test, coagulase test, citrate utilization, urea hydrolysis, motility, sugar fermentations and sulphide production (Cheesbrough, 1978; Mackie et al., 1987).

Analysis of results

Results obtained were analysed using Epi Info 6 statistical software, P values 0.05 were considered significant.

RESULTS

One Hundred and fifty three respondents on oral contraceptive pills were interviewed and urogenital samples subsequently collected and processed during the study period, and a corresponding 153 samples were collected from age matched females who were not on oral contraceptive pill use. The rate of urogenital colonization by *Candida species* among those on oral contraceptive pills was 36.8% (59/153) while 20.3% (31/153) was recorded among the control (95% CI, OR = 1.02 to 3.74, RR = 1.04 to 2.72, $P < 0.05$). Over all, the rate of genitourinary symptoms were recorded in 22.2% (34/153) and 5.2% (8/153) of the test and control subjects respectively ($P < 0.001$). *Candida* spp. were recovered

from 79.4% (27/34) of the women on oral contraceptive pills with urogenital symptoms; other microbial isolates recovered were *Trichomonas vaginalis* 8.8% (3/34), *Proteus mirabilis* 5.9% (2/34), and both *Enterococcus* spp. and Others 2.9% (1/34) each. Also 87.5% (7/8) of the isolates from the control group with urogenital symptoms were *Candida* spp. while the only other single isolate recovered was *T. vaginalis* (12.5%) (P > 0.05).

A review of genitourinary colonization by *Candida* spp. in relation to age showed that those aged 26 to 30 years old and those 20 recorded the highest 11.1% (n = 17) and lowest 1.3% (n = 2) rates of infections respectively with no significant age association (P > 0.05) (Table 1).

Based on marital status 27% (n = 33), 64.7% (n = 11) and 64.3% (n = 9) of those married, divorced widowed/separated and singles respectively had urogenital colonization by *Candida* spp. {X^2 (Yates corrected) = 7.70, 95% CI, OR= 0.24 - 0.74, RR = 0.37 to 0.80, P = 0.001}.

Analysis of urogenital colonization by *Candida* spp. in relation to educational levels among the respondents showed that 47.5% (26/55), 45.2% (19/42), 45.5% (15/33) and 39.1% (9/23) of those with nil, primary, secondary and tertiary education respectively were infected with no significant difference (P > 0.05).

A review of occupational distribution of the respondents vis-à-vis the rate of candidal infection showed that 40.5% (15/37), 38.2% (26/68), 41.2% (7/17) and 36.4% (4/11) of applicants, farmers, petty traders and civil servants respectively were infected as well as 40% (6/15) of the artisans (P> 0.05). Species of candida recovered *C. albicans* 74.6% (n=44), *C. glabrata* 15.3% (n=9) and *C. pseudotropicalis* 10.1% (n=6). Of the 59 species of Candida recovered, 2 (3.4%) were recovered from urine while 57 (96.6%) were recovered from genital specimens.

Those who could not associate candida with any genitourinary disease were 94.1% (144/153) while only 5.9% (9/153) could; only 3.3% (5/153) of the respondents could correctly mention at least one antifungal drug. Mode of approach of respondents towards treatment of genital infections were, 41.2% (63/153) would usually did nothing, 38.6% (59/153) usually attended hospital or clinic while 20.2% (31/153) usually took herbs; 97.4% (144/153) of the respondents had no knowledge about any health implication of vulvovaginal candidiasis.

A review of the clinical features associated with candidal infection showed that 54.2% (n = 32) had no clinical symptoms, 3.4% (n = 2), 8.5% (n = 5), 13.5% (n = 8) had itching only, discharge only, and discharge + itching respectively, while 5.1% (n = 3) had rashes only (Table 2).

Inspection of laboratory facilities at the family planning clinic and primary health care centres in the town and environs showed total or near absence of laboratory facilities for proper routine sample collections and processing in most (10/12, 83.3%) of the centres visited as well as absence of laboratory personnel.

DISCUSSION

The rate of urogenital candidal infection among the women on oral contraceptive pills (OCP) in Gboko was significantly high, 36.8% as compared to 20.3% among the control (P < 0.05), and genitourinary symptoms recorded in 22.2% compared to the significantly lower 5.2% among the control (P < 0.001). Also, *Candida* spp. were recovered from 79.4% of women on OCP with urogenital symptoms with a comparable figure of 87.5% among the control group (P > 0.05). Educational levels, age and occupation were not found to significantly affect the rate of urogenital candidiasis among the study population (P > 0.05). The rate was however found to be significantly higher among the singles, separated, widowed or divorced compared to the married (P < 0.05); this may be attributed to probably, the sexual vulnerability of these groups of people.

Candida spp. recovered from women taking OCP were *C. albicans*, *C. glabrata* and *C. pseudotropicalis* while in addition, *C. tropicalis* was recovered from the control group. Two (3.4%) and 57 (96.6%) isolates were recovered from urine and ECS/HVS specimens respectively. The prevalent urogenital symptoms were vaginal discharge 18.5%, itching 7.4% and rashes 11.1% while 54.2% of the infected women had no symptoms.

The high rate of vaginal candidiasis among women on OCP in Gboko compares well with findings from a similar study in Israel where *Candida* was recorded in 35.5% of symptomatic women and was the commonest agent (Dan et al., 2003); in Argentina (Buscemi et al., 2004), where Candida was also among the commonest isolates (17%) among women on OCP with symptomatic vaginitis; and in Italy (Spinillo et al., 1995), where the proportion of recurrent vulvovaginal candidiasis attributable to the use of OCP was found to average 11 to 12% and was significantly higher than women who were not taking OCP.

In view of the fact that, untreated symptomatic vulvovaginal candidiasis among women generally has been found to significantly increase the rate of transmission of other sexually transmitted diseases (STDs) including HIV infection, proper counselling should be given to women attending family planning clinics about the disease. The need for prompt treatment cannot be overemphasised. The common nature of the disease in the general adult women population could create an avenue to underrate its far reaching consequences if not promptly and adequately treated (Jombo et al., 2006).

Also in order to enhance prompt and comprehensive management of other STDs, appropriate laboratory facilities should be provided along side requisite personnel at the urban and rural clinics where not less than 70% of adult women with similar needs probably seek medical attention. This challenge in infrastructure and personnel was observed in the present study with lack of diagnostic facilities and dearth of competent

Table 1. Age distribution pattern and rate of genitourinary colonization by Candida species among women on oral contraceptive pills in Gboko town, north central Nigeria.

Age interval (years)	*Candida* spp. present (%)	*Candida* spp. absent (%)	Total (n)
20	2 (28.5)	5 (71.5)	7
21-25	13 (39.4)	20 (60.6)	33
26-30	17 (40.5)	25 (59.5)	42
31-35	14 (50.0)	14 (50.0)	28
36-40	13 (38.2)	21 (61.8)	34
41	0 (0.0)	9 (100)	9

X^2 (yates corrected) = 2.34, 95% CI, OR= 0.04 to 1.32, RR= 0.06 to 1.22, P (fisher exact) = 0.10.

Table 2. Clinical features associated with urogenital colonization by *Candida* spp. among women on oral contraceptive pills in Gboko town, north-central Nigeria (n = 59).

Clinical features	Number	Percent (%)
Nil	32	54.2
Itching only	2	3.4
Discharge only	5	8.5
Discharge + itching	8	13.5
Urinary frequency	1	1.7
Painful micturition	1	1.7
Waist pain	1	1.7
Rashes only	3	5.1
Itching + rashes	6	10.2
Total	59	100

personnel to carry out proper laboratory procedures. This no doubt would improve maternal health and contribute towards attainment of the millennium development goals (MDG) in healthcare delivery (Onyenekwe et al., 2004; Nyindo, 2005).

The findings from the present study are partly different from that of a similar study in Belgium (Avants et al., 1990) and Sweden (Shoubnikova et al., 1997) where bacterial vaginosis was found to be a commoner occurrence among women on OCP than candidiasis. Other studies have however shown that bacterial vaginosis enhances the onset of symptomatic vaginal candidiasis (Ceruti et al., 1993; Fosch et al., 2006). This calls for a wholesale approach towards management of urogenital diseases among women on OCP (Soong and Einarson, 2009 and Rahman et al., 1984).

The present study is limited by the fact that the probable contribution of other factors such as HIV infection, number of sex partners and may be frequency of sex were not ascertained, these limitations are well noted. The study was however able to give a broad overview of the burden and depth of knowledge of candidiasis among women in the community.

In conclusion, the present study has also reaffirmed the already existing knowledge that there is a significant increase in both asymptomatic and symptomatic vulvovaginal candidiasis among women on oral contraceptive pills. Adequate counselling and health education on the need for prompt and proper treatment of vaginal candidiasis as well as other STDs should be provided for the people at the family clinics and other comprehensive clinics. Also adequate laboratory facilities should be provided at these clinics and others in rural communities and requisite personnel to man them for proper investigation and subsequent treatment of candidiasis and other STDs.

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