

ORIGINAL ARTICLE

AFRICAN JOURNAL OF CLINICAL AND EXPERIMENTAL MICROBIOLOGY JAN 2011 ISBN 1595-689X VOL 12 No. 1
AJCEM/201093/21107 <http://www.ajol.info/journals/ajcem>
COPYRIGHT 2011
AFR. J. CLN. EXPER. MICROBIOL. 12(1): 32- 37

SYMPTOMATIC VULVOVAGINAL CANDIDIASIS: KNOWLEDGE, PERCEPTIONS AND TREATMENT MODALITIES AMONG PREGNANT WOMEN OF AN URBAN SETTLEMENT IN WEST AFRICA

Jombo, G.T.A., Akpera, M.T., Hembra, S.H. , and Eyong, K.I

¹Department of Medical Microbiology and Parasitology, College of Health Sciences, Benue State University, PMB 102119, Makurdi, Nigeria; ²Department of Haematology, College of Health Sciences, Benue State University, PMB 102119 Makurdi, Nigeria; ³Department of Gynaecology and Obstetrics, College of Health Sciences, Benue State University, PMB 102119 Makurdi, Nigeria; and ⁴Department of Paediatrics, College of Medical Sciences, University of Calabar, PMB 1115 Calabar, Nigeria.

Correspondence: JOMBO, G. T. A., Department of Medical Microbiology & Parasitology, College of Health Sciences, Benue State University, P. M. B. 102119 Makurdi, Nigeria. E.mail- jombogodwin@yahoo.com
Tel- +2348039726398

ABSTRACT

Background The use of oral contraceptive pills are increasingly becoming popular among women in both urban and rural Nigerian settings, its perceived association with gynaecologic infections not withstanding.

Aim: To ascertain the rate of urogenital candidiasis among women on oral contraceptive pills (OCP) in Gboko town.

Methods: 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.

Results 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 separated (64.4-64.7%) compared to the married 27% ($P < 0.05$). 79.4% of the symptomatic infections were caused by *Candida spp*. **Conclusion** 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: Oral contraceptive pills, Urogenital candidiasis, women

INTRODUCTION

Vulvovaginal candidiasis is not a rare gynaecological finding among women from both temperate and tropical parts of the world (1-3). These infections, when asymptomatic may persist for long periods of time with out obvious sequelae. The disease however poses serious health risks to pregnant women and the unborn children. In Poland, treatment of recurrent candidiasis in pregnant women was accompanied by increased episodes of bacterial vaginosis with risks of preterm labour (4); in Minnesota USA, development of candida chorioamnionitis with preterm labour and subsequent development of congenital candidiasis of the new born was reported (5); and in Canada, pregnant women recorded significantly higher rates of candidal urinary tract infections with obvious risks to the mother and the unborn child (6).

Since the advent of human immunodeficiency virus (HIV) infection in 1982 to date, the clinical relevance of vaginal candidiasis has proportionately deepened along with the course of other sexually transmitted disease (STDs) (7,8). The disease was found to contribute significantly to the spread of HIV infections at the onset of this disease's global epidemic and proper treatment of the disease along with other STDs was strongly recommended for effective of control of HIV AIDS in communities (9,10).

At present HIV AIDS is still a major problem in Nigeria as well as other parts of sub-Saharan Africa, a region believed to harbour at least 70% of the global burden of the disease (11,12). Proper and efficient control of the disease still appears to be a major challenge among African communities especially in the treatment and control of STDs. It is in this regard that this

study was set up to assess the level of vulvovaginal candidiasis among pregnant women in an urban community and their attitudes towards its control. The findings would be useful as one of the tools to assess maternal and child health care services in the community towards attainment of the millennium development goals (MDG) (13,14).

MATERIALS AND METHODS

Setting

The study was carried out in September 2009 in Gboko town, arguably the second largest town in Benues state situated about 82 kilometres north-east of Makurdi the 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

Pregnant women attending ante-natal 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 genital symptoms.

All the women who volunteered to enrol in the study were consecutively recruited into the study throughout the study period. 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 (15). 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°C. *Candida species* were identified based on cultural characteristics, gram stain and cell

morphology, and biochemical properties using germ tube test, chlamyospore formation test and carbohydrate fermentation (15,16). 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 (15,16).

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 pregnant women 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 pregnant. The rate of urogenital colonization by *Candida species* among pregnant women was 47.7% (73/153) while 20.3% (31/153) was recorded among the control (95% CI, OR=1.28-4.53, RR=1.95-3.09, P< 0.01). Over all, the rate of genitourinary symptoms were recorded in 28.8% (44/153) and 5.2% (8/153) of the test and control subjects respectively (95% CI, OR=2.03-17.84, RR= 1.89-11.77, P< 0.001). *Candida spp.* were recovered from 84.1% (37/44) of pregnant women with urogenital symptoms; other microbial isolates recovered were *Trichomonas vaginalis* 6.8% (3/44), *Proteus mirabilis* 4.5% (2/44), and both *Enterococcus spp.* and Others 2.3% (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 *Trichomonas vaginalis* (12.5%) (P> 0.05).

TABLE 1: AGE DISTRIBUTION PATTERN AND RATE OF VULVOVAGINAL CANDIDIASIS AMONG PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA (N=153).

Age Interval (Years)	Candida Present (%)	Candida Absent (%)	Total (%)
≤ 20	5 (3.3)	12 (7.8)	17 (11.1)
21-25	18 (11.8)	15 (9.8)	33 (21.6)
26-30	9 (5.9)	19 (12.4)	28 (18.3)
31-35	24 (15.6)	15 (9.8)	39 (25.5)
36-40	11 (7.2)	10 (6.5)	21 (13.7)
≥41	6 (3.9)	9 (5.9)	15 (9.8)
Total	73 (47.7)	80 (52.3)	153 (100)

X² (Yates corrected)= 0.41, OR= 0.50, RR= 0.51, P (Fisher Exact)= 0.49

Those who did not know Candidiasis as a disease were 94.1% (144/153) and 95.4% (7/153) could not list at least one urogenital symptom unique to candidiasis; 83.6% (134/153) of the respondents felt there was no compelling need for treatment while 86.3% (132/153) did not consider the disease of any serious clinical significance. Also, 94.1% (144/153) could not mention at least one valid health risk associated with candidiasis.

A review of the age distribution pattern of vulvovaginal candidiasis among the respondents showed that those aged 31-35, 21-25 and 36-40 years had 15.6% (24), 11.8% (18) and 7.2% (11) infections respectively with no significant age difference ($P > 0.05$). (Table 1) Analysis of clinical features associated with vulvovaginal candidiasis among the respondents with candidal colonization showed that 39.7% (29) had no symptoms, 15.1% (11), 17.8% (13), 9.6% (7) and 2.7% (2) had itching, discharge, rashes and waist pain respectively as the only complaint while others presented these feature in varying combinations. (Table 2)

TABLE 2: CLINICAL FEATURES ASSOCIATED WITH VULVOVAGINAL CANDIDIASIS AMONG PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA.

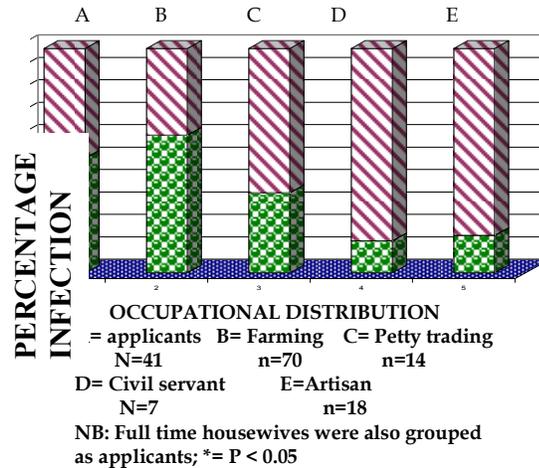
Clinical Features	Number (%)
Nil	29 (39.7)
Itching only	11 (15.1)
Discharge only	13 (17.8)
Discharge + Itching	5 (6.8)
Urinary Frequency	1 (1.4)
Painful Micturition	1 (1.4)
Waist Pain	2 (2.7)
Rashes only	7 (9.6)
Itching + Rashes	4 (5.5)
Total	73 (100)

Based on occupational distribution of the respondents, 51.2% (21), 61.4% (43/70) and 35.7% (5/14) of the applicants, farmers and petty traders were respectively infected while 14.3% (1/7) civil servants and 16.7% (3/18) were respectively infected (RR=3.0, CI=3.3-4.2). (Figure 1)

Among the *Candida species* recovered, *C. albicans* 64.4% (47), *C. glabrata* 15.1% (11), *C. stellatoidea* and *C. tropicalis* 6.8% each (5) were the four most common species. All the *Candida species* were recovered from genital specimens and none from urine specimens. Urinary tract

infection was detected in 1.3% (2) of the subjects with *Proteus mirabilis* and *Enterococcus species* respectively being responsible. (Table 3).

FIGURE 1 OCCUPATIONAL DISTRIBUTION AND RATE OF VULVOVAGINAL CANDIDIASIS AMONG PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA (N=153)



Analysis of the modes of transmission of candidiasis among the respondents showed that 58.2% (89), 36.6% (56) and 23.5% (36) attributed acquisition from toilet, dirty water and insects respectively; 12.4% (19) and 8.5% (13) attributed it to cold and sexual means respectively; 17.6% (27) had no idea while 2.0% (3) attributed the infections to other factors such as dirty hands and seats. (Table 4)

A review of the modes of treatment showed that 76.5% (117), 12.4% (19) and 11.1% (17) respectively usually sought no treatment, visit hospital or clinic, and take traditional herbs. Those who would mention correctly at least one antifungal drug for its treatment were 17 (11.1%). (Figure 2)

TABLE 3 SPECIES OF CANDIDA RECOVERED FROM UROGENITAL SPECIMENS OF PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA (N=73).

Candida Species	Number (%)
<i>Candida albicans</i>	47 (64.4)
<i>Candida glabrata</i>	11 (15.1)
<i>Candida tropicalis</i>	5 (6.8)
<i>Candida stellatoidea</i>	5 (6.8)
<i>Candida pseudotropicalis</i>	2 (2.7)
<i>Candida guilliermondi</i>	2 (2.7)
Unspecified	1 (1.4)
Total	73 (100)

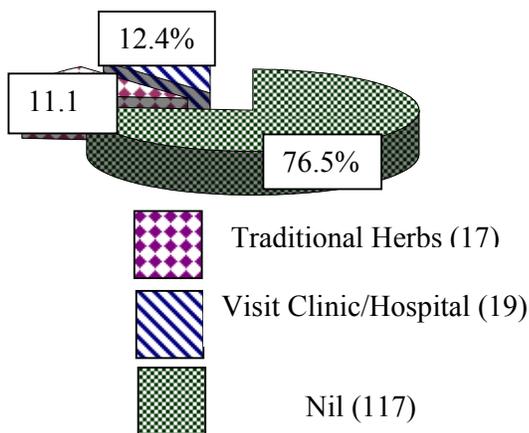
TABLE 4 MODES OF TRANSMISSION OF CANDIDA SPECIES ADVANCED BY PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA (N= 153).

Modes of Transmission	Number (%)
Toilet	89 (58.2)
Dirty Water	56 (36.6)
Insects	36 (23.5)
Cold	19 (12.4)
Sexual Means	13 (8.5)
Others	3 (2.0)
No Idea	27 (17.6)

NB: Respondents were allowed to identify more than one option.

Based on educational levels, 40.0% (61), 30.7% (47), 20.5% (31) and 9.0% (14) of the respondents had nil, primary, secondary and tertiary education respectively with no significant difference in the rate of infection ($P > 0.05$). Also, 147 (96.0%), 3 (2.0%) and 3 (2.0%) of the respondents were married, separated or widowed of divorced, and singles respectively with no significant marital difference ($P > 0.05$).

FIGURE 2 MODES OF TREATMENT OF VULVOVAGINAL CANDIDIASIS AMONG PREGNANT WOMEN IN GBOKO, NORTH CENTRAL NIGERIA (N=153).



DISCUSSION

The incidence of asymptomatic vulvovaginal candidiasis among pregnant women in Gboko of 47.7% was significantly higher than that of the control (20.3%) ($P < 0.001$); similarly the rate of symptomatic candidiasis among the pregnant women significantly higher (28.8% vs 5.2%) ($P < 0.001$). The general knowledge about the disease among the women was poor especially as concerning modes of transmission, treatment attitudes, and most especially health implications. The level of care

by the respondents was similarly low as none of them with candidal symptoms came to the clinic primarily for it. Only 12.4% would visit clinic for its treatment however, none of the women found with symptomatic candidiasis visited clinic with the aim to seek medical attention for it. The infections were found to be strongly associated with farmers, applicants and petty traders (CI=3.3-4.2).

The findings from the present study partly agrees with findings from similar studies in: Italy where candidiasis was detected in 53.3% of the women studied and was the single most common infection (17); Israel where *Candida species* constituted the highest number of microorganisms recovered and were detected in 35.5% of the women (18); Poland where *Candida* was recovered from 20.7% of the genital specimens of women in labour and was the commonest organism (19); and in Bulgaria where a much higher figure of recurrent vaginal candidiasis of 85.72% was documented among pregnant women (20). The correlation of the disease with certain groups of people such as farmers, petty traders and applicants is most probably a reflection of the general trend of the disease in the community which strongly points towards socioeconomic factors^{11,12,19}.

Candida albicans was the single most common specie recovered from the genital specimens followed by *Candida glabrata*. This pattern of *Candida species* recovered corroborates fairly with findings from Tanzania (21), Sweden²², Italy²³ and Nigeria²⁴ where *Candida albicans* was the single most common specie recovered from the genital specimens processed. The relatively higher rate of *C. glabrata* recovered in Germany²⁵ from a similar study could be attributed to, most probably regional or geographic specie variations, although, the influence of genetic factors may need to be explored.

The species of *Candida* recovered from the present study are slightly different from that of Nikolov, *et al* in Bulgaria where *Candida parapsilosis* was isolated²⁰, and in Spain where *Candida krusei* was recovered (26). Besides confirming the world wide distribution of infectious *Candida species*, the lack of adequate laboratory facilities in the present study could have influenced the scope of speciation of the *Candida* isolates. Paucity of laboratory facilities and competent laboratory personnel was noted as a general problem by the research team in most of the health centres in the community.

RECOMMENDATIONS

In view of the low level of understanding and awareness about the effect of candidiasis

among pregnant women in Gboko, health education should be instituted at the ante-natal clinics as well as other clinics where pregnant women seek similar services. This would raise their level of awareness and correct their perception towards the need for its prompt treatment as well as other STDs. These health talks should be extended by appointed health educators or voluntary health educators to other social and informal gatherings of women in the community.

Due to the high prevalence of HIV/AIDS presently in the country as a whole (11,1)2, safe and protective sex should be strongly advocated with proper sex education to the people. This campaign should involve both pregnant and non-pregnant women so as to reduce the risk posed by symptomatic *Candida* infections towards the transmission of other STDs including HIV.

Towards improving maternal and child health in the community and with the present high level of candidiasis among pregnant women, routine screening for symptomatic vulvovaginal candidiasis should be instituted at hospitals and clinics in the locality. This would protect both the mother and child from both the primary and secondary effects of the disease (27-29).

Government in collaboration with her regulatory authorities should review guidelines for setting up hospitals and clinics in the country. This should include, among others, a minimum basic requirement for effective laboratory diagnosis of STDs as well as other infectious diseases since these diseases constitute a major segment of all the hospital or clinic attendees.

CONCLUSION

The rate of symptomatic vulvovaginal candidiasis among pregnant women in Gboko is high with a corresponding low level of awareness and care about the disease. Health education should be instituted at ante-natal clinics so as to raise the knowledge and level of awareness of the people towards seeking prompt and appropriate treatment.

REFERENCES

1. Matthews P, Drew SV, Law L. Recurrent vaginal thrush and soreness. *Practitioner* 1999; 243(1602): 633-6.
2. Pikuza VV, Chilova RA, Ishchenko AI. Comparison of clinical efficacy and safety of domestic generic and original fluconazoles in the treatment of pregnant women with vulvovaginal candidiasis. *Antibiot Khinioter* 2008; 53(7-8): 35-7.
3. Lisiak M, Klyszejko C, Pierzecholo MI, Sowinska-Przepiera E, Wlosinska J. The effect of treatment for vaginal yeast infection on the prevalence of bacterial vaginosis in early pregnancy. *Ginekol Pol* 2000; 71: 964-70.
4. Pawlaczyk M, Friebe Z, Pawlaczyk MI, Sowinska-Przepiera E, Wlosinska J. The effect of treatment for vaginal yeast infection on the prevalence of bacterial vaginosis in early pregnancy. *Acta Dermatovenerol Croat* 2006; 14(1): 26-9.
5. Van Winter TJ, Ney JA, Ogburn PL Jr, Johnson RV. Preterm labour and congenital candidiasis. A case report. *J Reprod Med* 1994; 39(12): 987-90.
6. Lee M, Bozzo P, Finarson A, Koren G. Urinary tract infections in pregnancy. *Can Fam Physician* 2008; 54(6): 853-4.
7. Coombs RW, Reichelderfer PS, Lunday AL. Recent observations on HIV type-1 infection in the genital tract of men and women. *AIDS* 2003; 17(4): 455-480.
8. Vernazza PL, Eron JJ, Fiscus SA, Cohen MS. Sexual transmission of HIV: infectiousness and prevention. *AIDS* 1999; 13: 155-166.
9. Desruisseau AJ, Schmidt-Grimminger D, Welly E. Epidemiology of HPV in HIV-Positive and HIV-Negative fertile women in Cameroon, West Africa. *Infect Dis Obstet Gynaecol* 2009; 810596e.
10. Hajjar AM, Lewis PF, Endeshaw Y, Ndinya-Achola J, Kreiss JK, Overbaugh J. Efficient isolation of human immunodeficiency virus type I RNA from cervical swabs. *J Clin Microbiol* 1998; 36: 2349-52.
11. Jombo GTA, Egah DZ, Banwat EB. Human immunodeficiency virus infection in a rural community of Plateau state: Effective control measures still a nightmare? *Nig J Med* 2006; 15(1): 49-51.
12. Jombo GTA, Egah DZ, Akosu JT, Bella IS. Beliefs and perceptions about acquired immunodeficiency

- syndrome (AIDS) of a Nigerian rural community. The implications for prevention policy and programs. *Afr J of Clinical and Experimental Microbiology* 2007; 8(1): 40-45.
13. Takano T, Nakamura K, Watanabe M. Urban residential environments and senior citizens' longevity in megacity areas: the importance of walkable green spaces. *J Epidemiol Comm Health* 2002; 56: 913-18.
 14. Douglas MJ, Conway L, German D, Gavin S, Hanlon P. Achieving better health through health impact assessment. *Health Bull (Edinb)* 2001; 59: 300-305.
 15. Cheesbrough M. Medical laboratory manual for tropical countries. 2ND Edn. Vol. 2. United Kingdom, Cambridge: ELBS University press, 1978; 479p.
 16. Mackie M, Collee JG, Duguid JP, Frasser AG, Marmian BP. *Practical Medical Microbiology*, 13th Edn. Edinburgh, Longman Publishers, 1987; p675.
 17. Spinillo A, Bernuzzi AM, Cevini C, Gulminetti R, Luzzi S, De Samtoto A. The relationship of bacterial vaginosis, Candida and Trichomonas infection to symptomatic vaginitis in post-menopausal women attending vaginitis clinic. *Maturitas* 1997; 27(3): 253-60.
 18. Dan M, Kaneti N, Levin D, Poch F, Samra Z. Vaginitis in a gynaecologic practice in Israel: causes and risk factors. *Isr Med Assoc J* 2003; 5(9): 629-32.
 19. Lisiak M, Klyszejko C, Pierzehalo T, Marcinkowski Z. Vaginal candidiasis: frequency of occurrence and risk factors. *Ginekol Pol* 2000; 71(9): 964-70.
 20. Nikolov A, Shopova E, Mikhova M, Dimitrov A. Treatment in cases of recurrent vaginal candida infection during pregnancy. *Akush Ginekol* 2007; 46(9): 23-6.
 21. Namkinga LA, Matee MIN, Kivaisi AK, Moshiro C. Prevalence and risk factors for vaginal candidiasis among women seeking primary care for genital infections in Dar es Salaam, Tanzania. *East Afr Med J* 2005; 82(3): 139-44.
 22. Shoubnikova M, Hellberg D, Nilsson S, Mardh PA. Contraceptive use in women with bacterial vaginosis. *Contraception* 1997; 55(6): 355-8.
 23. Spinillo A, Capuzzo E, Nicola S, Baltaro E, Ferrari A, Monaco A. The impact of oral contraception on vulvovaginal candidiasis. *Contraception* 1995; 51(5): 293-97.
 24. Akerele J, Abhulimen P, Okonofua F. Prevalence of asymptomatic genital infection among pregnant women in Benin city, Nigeria. *Afr J Reprod Health* 2002; 6(3): 93-97.
 25. Friese K, Neumann G, Siebert J. Topical antiseptics as an alternative in the treatment of acute vulvovaginal candidiasis. *Arch Gynaecol Obstet* 2003; 268(3): 194-7.
 26. Buscemi L, Arechavala A, Negroni R. Study of acute vulvovaginitis in sexually active adult women with special reference to candidosis in patients of the Francisco J Muniz Infectious Diseases hospital. *Rev Iberoam Micol* 2004; 21(4): 177-81.
 27. Hilber AM, Francisco SC, Chersich M, Scott P, Redmond S, Bender N, Miotti P, Temmerman M, Low N. Intravaginal practices, vaginal infections and HIV acquisition: systematic review and meta-analysis. *PLoS One* 2010; 5(2): e.
 28. Madhu J, Charu G, Mohan K. Sexually transmitted diseases and carcinogenesis. *J Obstet Gynaecol Ind* 2004; 54(1): 73-76.
 29. Glover DD, Larson B. Longitudinal investigation of candida vaginitis in pregnancy: role of superimposed antibiotic use. *Obstet Gynaecol* 1998; 91(1): 115-8.