

Full Length Research Paper

Microbial agents of abnormal vaginal discharge in pregnant mothers attending Primary Health Care Centers of Jos, Nigeria

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Infective genital discharge in a pregnant mother poses a greater risk of transmission of HIV to the unborn child and other complications such as abortion, premature rupture of membrane, prematurity and low birth weight. To detect some common microbial agents of abnormal vaginal discharge in pregnant women in order to improve the early diagnosis and prompt treatment in line with current syndromic management. A prospective study of female genital swabs from pregnant women collected from Primary Health Care Centers, Jos and analysed for microscopy, culture and sensitivity in Jos University Teaching Hospital, December 2006 to December 2007. Data on epidemiologic indices were collected from the patients, using structured interviewer- administered questionnaires. Microbial agents were detected in 54.3% (n = 380) of a total 700 female genital swab from the pregnant mothers studied. *Candida* species were at the peak of the group of causative agents with 80.0% (n = 304) of the 380 positive genital swab samples, other causative agents were *Gardnerella vaginalis*, an agent of bacteria vaginosis with 7.6% and *Trichomonas vaginalis*, 1.8%. The distribution of abnormal vaginal discharge was highest in the multigravida (73.3%) and is commonest in the first and third trimesters of pregnancy with 44.7 and 39.5% respectively. Abnormal vaginal discharge was prevalent in the multigravida group and the commonest microbial agents of infective vaginal discharge among the pregnant mothers were *Candida* species. We recommend early diagnosis, prompt treatment and prevention of infective female genital discharge in pregnant mothers in order to curtail the transmission of HIV.

Key words: Microbial agents, abnormal vaginal discharge, pregnant mothers.

INTRODUCTION

Abnormal vaginal discharge is a gynecologic disorder that manifests with an offensive non-bloody discharge in the female lower reproductive tracts. It is a common complaint among women of different age groups in any society whether or not they are sexually active. It may be regarded as any amount of secretion that the patient is

worried about. Vaginal discharge may be normal or abnormal (Omole-Ohonsi et al., 2006). Normal vaginal discharge is physiologic, such as occurs during pregnancy, sexual arousal or at specific period in the menstrual cycle. Physiologic vaginal discharge in pregnancy is colorless or white, non irritating and odorless or has mild odor and is non infective in nature with no sequelae. On the other hand, abnormal vaginal discharge may be green, yellow, brown or red in colour with foul smelling odor, pruritus, irritation, dysuria or dyspareunia depending on the type of infection (Osoba and Olufade,

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1973).

Microbial agents of abnormal vaginal discharge include: 1. (group affecting the cervix) – *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, Group B – *streptococcus*, *Ureaplasma urealyticum*, *Herpes simplex virus*; 2. (group affecting the vagina) – *Candida albicans*, *Trichomonas vaginalis* and *Gardnerella vaginalis* (Osoba and Olufade, 1973).

Although vaginitis or inflammation of the vagina generally is both treatable and mild, when left untreated, is a possible risk for acquisition of HIV/AIDS as well as other complications (UNAIDS, 2003). Abnormal vaginal discharge in pregnancy poses a greater risk of transmission of HIV to the unborn child and may result to abortion, premature rupture of membrane, prematurity and low birth weight. The relationship between pregnancy and infective vaginal discharge with a particular note on candidiasis indicates increase in hormonal influences and alteration in vaginal pH (Sobel et al., 1998).

Therefore, detection of common microbial causative agents of abnormal vaginal discharge in this risk group, will improve early diagnosis, prompt treatment and prevention of infective vaginal discharge in line with current syndromic management.

MATERIALS AND METHODS

This descriptive study was carried out from December 2006 to December 2007 in PHC facilities of Jos. The PHC centers were selected by simple balloting. Approval of the study protocol was obtained from the Ethics Committee of Jos University Teaching Hospital. Further permission was obtained from Local Government Councils and the Primary Health Care Departments.

Consent of the patients was received and they were assured of strict confidentiality of responses. Structured interviewer-administered questionnaire was then introduced. Data were collected from 700 pregnant women using an interviewer-administered questionnaire based on sample prescription. Questionnaire included serial number, date, age, address, educational status, marital status, occupation, last menstrual period, number of pregnancies, any abnormal vaginal discharge? If yes, what is the volume of the discharge (mild, moderate, profuse)? Odor (odorless, offensive)? Color (colorless, yellow, creamy, greenish, mixed with blood, any other)? Type of discomfort (irritation, itching, painful micturition, painful coitus, any other)? At what stage of pregnancy was it first noticed (0 - 13 weeks, > 13 weeks – 27 weeks, > 27 weeks - term)? Genital swabs were taken from the pregnant women who had abnormal vaginal discharge.

Laboratory procedure

Endo – cervical and high vaginal swabs were collected following aseptic precautions (VanDyck et al., 1999). The genital swabs were immediately sent to the genital bench of Medical Microbiology and Parasitology laboratory, Jos University Teaching Hospital where they were processed according to standard procedures (VanDyck et al., 1999). Infection with *Candida* species was diagnosed by microscopy of a saline mount, Gram-stained smear of material from

the vagina and colonial growth on Sabouraud's dextrose agar. *T. vaginalis* was diagnosed by microscopy of a saline mount for the actively motile, spear shaped flagellates. *G. vaginalis*, an agent of bacterial vaginosis, was diagnosed by Whiff test and the evaluation of Gram stained vaginal smear at oil immersion power (x 1000) objective for Clue cells; usually representing at least 20% of vaginal epithelial cells.

Cervical specimens were Gram stained and cultures were inoculated on plates of Chocolates and Thayer-Martin (Oxoid) media and incubated at 37°C in a moisturized candle extinction jar for 24 to 72 h. *N. gonorrhoeae* was identified by typical colonial morphology, reactions to gram-stain, positive oxidase test and sugar fermentation. The antibiotic sensitivity of isolates was tested by the agar diffusion method on chocolate agar plates using Oxoid multi-discs with standard antibiotic concentrations. The samples collection, transportation and processing including microscopy, culture and biochemical tests were carried out according to recommended standard protocol (VanDyck et al., 1999). The results were analysed using SPSS 11.0 statistical software; chi-square (χ^2) was used to compare association between proportions and p-values < 0.05 were considered significant at 95.0% confidence level.

RESULTS

In a total of 700 pregnant women seen from December 2006 to December 2007, 380 (54.3%) had abnormal vaginal discharges. The pregnant women were categorized according to their age groups ranged from 0 - 60 years. In the age range 0 - 10 years there was nil (0.0%) pregnant women out of the 700 pregnant women population, in the 11 - 20 years age bracket there were 100 (14.3%) pregnant women, 21 - 30 years 350 (50.0%), 31 - 40 years 246 (35.1%), 41 - 50 years 4 (0.6%) and 51 - 60 years 0 (0.0%). The age distribution of pregnant women with abnormal vaginal discharge was as follows; 0 - 10 years 0 (0.0%), 11 - 20 years 10 (2.6%), 21 - 30 years 250 (65.8%), 31 - 40 years 120 (31.6%), 41 - 50 years 0(0.0%), 51 - 60 years 0 (0.0%) (Figure 1). Multigravida (≥ 3 pregnancies) with abnormal vaginal discharge were 280 (73.7%) of the population of 380 pregnant women with abnormal vaginal discharge while the primigravida were 100 (26.3%) (Table 1).

In the first trimester of gestation (≤ 13 weeks), pregnant women with abnormal vaginal discharge were 170 (44.7%) of the total 380 pregnant women with abnormal vaginal discharge. In the second trimester (13 - 27 weeks) and third trimester (27 weeks to term) there were 60 (15.8%) and 150 (39.5%) pregnant women with abnormal vaginal discharge respectively (Figure 2).

Vaginal microbial agents were detected in 340 (89.5%), cervical agents in 0 (0.0%) and undetermined causes were 40 (10.5%) of the total 380 female genital smears. The etiologic investigation indicated *Candida* species in 304 (80.0%), *G. vaginalis* 29 (7.6%), *T. vaginalis* 7 (1.8%) and *N. gonorrhoeae* 0 (0.0%) of the 380 genital swabs. In a total of 304 *Candida* species; 228 (75.0%) was detected in age group 21 – 30 years. 10 samples had multiple

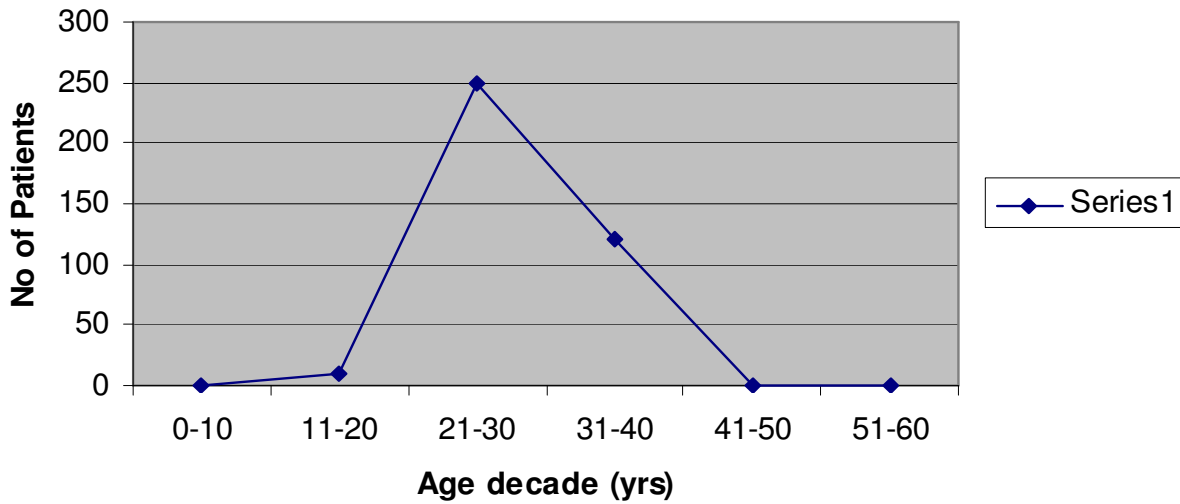


Figure 1. Age distribution of pregnant mothers with abnormal vaginal discharge.

Table 1. Distribution of pregnant mothers with abnormal vaginal discharge in Primary Health Care Centers Jos, Nigeria.

Age (years)	Pregnant women n (%)	Pregnant women with abnormal vaginal discharge, n (%)	Multigravida with abnormal vaginal discharge	Primigravida with abnormal vaginal discharge
0 - 10	-	-	-	-
11 - 20	100 (14.3)	10 (2.6)	-	10
21 - 30	350 (50.0)	250 (65.8)	160	90
31 - 40	246 (35.1)	120 (31.6)	120	-
41 - 50	4 (0.6)	-	-	-
51 - 60	-	-	-	-
Total	700 (100)	380 (54.3)	280 (73.7)	100 (26.3)

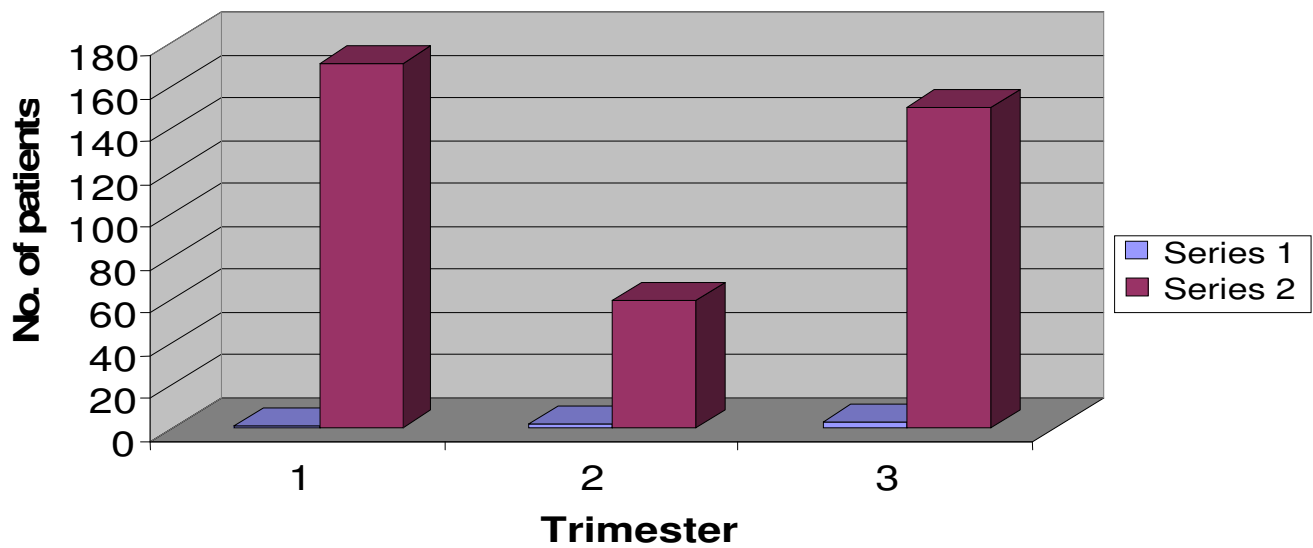


Figure 2. Distribution of abnormal vaginal discharge among the study population according to gestation period (trimester).

Table 2. Distribution of microbial agents of abnormal vaginal discharge in Pregnant Mothers in Primary Health Care Centers in Jos, December 2006 to December 2007.

Age group (years)	Pregnant women with abnormal vaginal discharge n (%)	Microbial agents				Undetermined causes
		<i>Candida spp.</i>	* <i>G. vaginalis</i>	<i>T. vaginalis</i>	<i>N. gonorrhoea</i>	
0 - 10	-	-	-	-	-	-
11 - 20	10 (2.6)	6	2	-	-	2
21 - 30	250 (65.8)	228	10	4	-	8
31 - 40	120 (31.6)	70	17	3	-	30
41 - 51	-	-	-	-	-	-
51 - 60	-	-	-	-	-	-
Total	380 (100)	304 (80.0)	29 (7.6)	7 (1.8)	-	40 (10.5)

**G. vaginalis* = *Gardnerella vaginalis*; *T. Vagnalis* = *Trichomonas vaginalis*; *N. gonorrh* = *Neisseria gonorrhoea*. **10 samples contained multiple isolates.

multiple isolates (Table 2).

DISCUSSION

The present study was set to detect common microbial causes of infective genital discharge among pregnant women in primary health care centers in Jos. The work will improve the prevention, early diagnosis and treatment of abnormal vaginal discharge among pregnant women and reduce the transmission of HIV to the unborn child and other complications.

The following microbial agents were detected as follows, *Candida species*, *G. vaginalis* and *T. vaginalis* in descending order.

Candidiasis was a leading cause of vaginal discharge in the study with 304 (80.0%) of the total 380 female genital samples of the infected pregnant women.

The result was higher than the result of some earlier studies done on general female population (Nwokedi et al., 2003; Sobel et al., 1998) which recorded 52.5 and 60% respectively.

The relationship between pregnancy and infective vaginal discharge with a particular note on candidiasis indicates increase in hormonal influences and alteration in vaginal pH (Sobel et al., 1998).

Predominance of candidiasis in the study was in the age group 21 - 30. The age decade of 21 - 30 is the most sexually active age group with highest risk of pregnancies, indulgence in family planning pills and immunosuppression due to HIV/AIDS (Sobel et al., 1998).

The inflammation of the vagina, as in any inflammatory STI, increases the risk of acquisition of HIV (Kenneth, 2003). Candidiasis is not usually sexually transmitted, though male contacts should be seen, firstly, if they have symptoms and secondly, if the woman is having recurrences.

Bacterial vaginosis (BV) was one of the causes of vaginal discharge in the study with 29 (7.6%) out of the total 380 female genital samples among the pregnant women with infective genital discharge.

A previous study done by Ison and Hay, (2002) on a general female population recorded 30% of BV which is much higher than the present finding in the population of pregnant women. BV is the most common cause of vaginal discharge among young women of child bearing age and has sexual promiscuity as a risk factor (Kenneth, 2003).

The rate of acquisition of HIV among women with BV is much higher than in women with normal vaginal flora (Kenneth, 2003). BV and vaginal trichomoniasis have been implicated with an increased risk of transmission of HIV and further complication in pregnancy includes premature rupture of membrane, pre-term delivery and low birth weight. Sexual partners of patients with *T. vaginalis* should always receive treatment, whether or not they are symptomatic (Cotch et al., 1997).

Undetermined agents contributed 40 (10.5%) out of the 380 total sample of female genital discharge among infected pregnant women in the study, which was lower than previous studies on general female population (Sobel et al., 1998; Cotch et al., 1997) which recorded 35 and 46.2% respectively. Inability to resolve the undetermined causes in the study was a limitation.

It is possible that a number of women might harbor some infections due to *Chlamydia*, *U. urealyticum* and other organisms which were not easily detected by our tools. Also some undetected chemicals and physical agents could be contributory to the discharge.

Multigravida constituted 73.3% (n = 280) high rate of infective genital discharge among the pregnant mothers in the study. The finding is similar to a study done in north western Nigeria (Omole-Ohonsi et al., 2006).

Again, 44.5% rate of infective vaginal discharge in pregnancy was found in first trimester and 39.5% in third trimester.

In reference to this finding, it is advisable to screen for infective vaginal discharge in pregnancy more often at the extremes of gestational age with more suspicion in the multigravida.

In conclusion, *Candida species* was the commonest agent of infective genital discharge among pregnant mothers.

We recommend prevention, early diagnosis and prompt treatment of abnormal vaginal discharges in order to curtail the transmission of HIV.

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