

Bacteria Vaginosis and Pregnancy Outcome in Osogbo, Nigeria

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Abstract: Although Bacterial Vaginosis (BV) is increasingly being recognized as a health problem among pregnant women, this entity has not been well studied in our environment. The aim of this study, is to determine the prevalence of BV among pregnant women attending the Antenatal Clinic (ANC) of our hospital and possible effects on pregnancy outcome. All pregnant women attending the ANC of Ladoke Akintola University Teaching Hospital (LAUTECH) between July 2004 and December 2005 with the exception of women with diabetics, pregnancy induced hypertension, sickle cell disease, human immunodeficiency virus infection, obstetric complications or women who have taken antibiotics 2 weeks prior to ANC visit, were prospectively studied. High vaginal swab was collected from each woman at the 1st or 2nd trimester of pregnancy and subjected to wet film microscopy and Gram reaction. BV was diagnosed using the clinical criteria recommended by Amsel *et al* and Gram stain morphology described by Spiegel. All the women were followed up till delivery to determine outcome of pregnancy. Of the total of 204 pregnant women studied (age range 20-40 years, mean age 28.941±4.214, median age 28.5years), 51 had BV, giving a prevalence of 25%; 48 had BV by both clinical criteria and Gram stain morphology, 2 had BV by clinical criteria alone while 1 had BV by Gram stain morphology alone. The overall agreement between the two methods is 94.1%. The age of women with BV ranged between 22 and 44 years (mean age 28.118±4.299 years). There was no significant difference in the mean age of women with BV and those without BV (p=0.3560). BV was commoner among primigravidae (27/51) than multigravidae (24/51) (p=0.0341). Twelve of 153 (7.84%) women without BV had pre-term deliveries while 9 of 51 (17.65%) with BV had pre-term deliveries (p=0.0614). Primigravidae with BV (6/9) did not significantly had more preterm deliveries than those without BV (3/12) (p=0.4857). The mean birth weight of 3.151±0.5562 kg among women with BV was also not significantly different from the mean birth weight of 3.074±0.4629 kg among women without BV (p=0.5707). Although the prevalence of BV is high among pregnant women in our environment, our study did not demonstrate any significant adverse effect on pregnancy outcome.

Key words: Bacteria vaginosis, pregnancy, outcome, Osogbo, Nigeria

INTRODUCTION

Bacteria Vaginosis (BV) is a common vaginal syndrome seen in women of reproductive age associated with abnormal discharge and is increasingly recognized as a health risk with significance beyond the discomfort and annoyance of a localized vaginal infection. It is the most commonly diagnosed cause of infectious vaginal discharge; in as many as 60% of cases, the woman is asymptomatic. It has also been said to be the leading cause of preventable preterm birth (Hillier *et al.*, 1995; McGregor *et al.*, 1995; Harald *et al.*, 2003).

Although several other factors have been found to correlate with adverse pregnancy outcome (McGregor *et al.*, 1990; Harald *et al.*, 2003) BV among pregnant

women has not been extensively studied in our environment (Harald *et al.*, 2003). The aim of this study therefore, is to determine the prevalence of BV among pregnant women attending the antenatal clinic of our hospital and determine its effects on pregnancy outcome.

MATERIALS AND METHODS

Study population: All pregnant women in their 1st or 2nd trimester attending Antenatal Clinic (ANC) of the Ladoke Akintola University Teaching Hospital (LAUTECH), Osogbo and Osun State, Nigeria, between July 2004 to December 2005 with and without symptoms of vaginal discharge were enrolled into the study. Informed consent of each participant was obtained. Consent of the Joint

Ethical and Research Committee of LAUTECH College of Health Sciences and Teaching Hospital was also obtained.

The following pregnant women were excluded; women who have taken antibiotics 2 weeks prior to ANC visit; women who develop obstetric complications and women with diabetics, pregnancy induced hypertension, chronic renal disease and sickle cell disease and human immunodeficiency virus infection.

Sampling procedure: All the women had speculum vaginal examination performed. Specimens were collected with sterile cotton swab from the lateral and posterior fornices of the vaginal and from the endocervix. Swabs were immediately transported to the Medical Microbiology laboratory for processing. The colour of the specimen on the speculum was noted. A drop of 10% KOH was also placed over the specimen on the speculum and the odour noted. The pH of the specimen was determined using pH indicator paper with range 3.8-6.0.

Microscopy/wet preparation: Wet preparations of the swab specimens were made on clean grease-free slides and examined under compound light microscope for presence of clue cells. A gram stained smear of each specimen was counterstained with safranin and evaluated for BV by the method of Spiegel *et al.* (1983).

Clinical diagnosis of BV: BV was diagnosed using any 3 of the 4 clinical criteria recommended by Amsel *et al.* (1983) which are; presence of homogenous white-grey adherence vaginal discharge; vaginal pH of > 4.5; presence of "clue cells" (with greater than 20% of epithelial cells with clue cells) on wet mount and iv a 'fishy' amine odor of the vaginal discharge before or after addition of 10% KOH (positive 'whiff' test).

Gram staining diagnosis of BV: The quantitative Gram-stained smear method of Spiegel *et al.* (1983) was also used to diagnose BV. Only smear observed on light microscopy with < 5 large gram positive rods (lactobacilli morphotypes)/oil immersion field) and = 5 small gram negative rods or curved gram variable rods or gram positive cocci or fusiforms (other morphotypes)/oil immersion field, were considered to be BV.

Data collection and analysis: Data collected include age, marital status, occupation, gravidity, parity, outcome of pregnancy, gestation age at delivery and birth weight. The birth weight of each baby was compared with a standard birth weight chart and those that fell below the 10th percentile for that sex and gestational age were considered low birth weight.

Data were entered into IBM compatible computer with SPSS software. Association between continuous variables was evaluated with students t test and that of categorical variables with Chi square test and level of significance was set at $p < 0.05$.

RESULTS

A total of 204 pregnant women attending the antenatal clinic of Ladoke Akintola University Teaching Hospital between July 2004 and December 2005 were studied. The age range is 20-40 years (mean age 28.941 ± 4.214 , median age 28.5 years). Sixty three (30.9%) are primigravidae while 141 (69.1%) are multigravidae, 133 (65.2%) are in their 1st trimester while 71 (34.8%) are in their 2nd trimester. Traders constitute the largest occupational group patronizing the clinic (34.3%) followed by civil servants 17.2%, housewives/unemployed 13.7% and others (Table 1). Most (94.6%) are married while few are single (3.9%), divorced (1.0%) and separated (0.5%) (Table 2).

A total of 51 women were positive for BV, giving a prevalence of 25%. Forty eight (94.1%) of these women were positive by both the clinical criteria (Amsel *et al.*, 1983) and gram stain morphology (Spiegel *et al.*, 1983) 2 (3.9%) were positive by clinical criteria alone while 1 (1.9%) was positive by gram morphology alone. The overall agreement between the 2 methods is 94.1%.

The age range of the positive women is 22-44 years (mean age 28.118 ± 4.299 years, median age 27.0 years); 27 (52.9%) are primigravidae while 24 (47.1%) are multigravidae, BV occurred more commonly among primigravidae than multigravidae (OR = 3.656, 95%CI = 1.156-11.566, $p = 0.0341$).

Using univariable analysis to determine the effects of BV on pregnancy outcomes (measured by 2 parameters;

Table 1: Occupational distribution of pregnant women at Ladoke Akintola university teaching hospital, Osogbo

Occupation	Number	(%)
Traders	70	34.3
Civil servants	35	17.2
Teachers/bankers	19	9.3
Medical/paramedicals	17	8.3
Artisan/semiskilled	15	7.4
Students	20	9.8
Housewives/unemployed	28	13.7
Total	204	100

Table 2: Marital status of pregnant women at Ladoke Akintola university teaching hospital, Osogbo

Status	Number	(%)
Married	193	94.6
Single	8	3.9
Divorced	2	1.0
Separated	1	0.5
Total	204	100

gestation age at delivery and birth weight), 9 of 51 (17.65%) women with BV and 12 of 153 (7.84%) without BV had pre-term deliveries but this relationship did not reach a significant level (Fisher exact OR = 2.518, 95% CI = 0.9928-6.386, $p = 0.0614$). The primigravidae with BV (6/9) tend to have preterm deliveries more commonly than those without BV (3/12), (OR = 6.000, 95%CI = 0.2213-162.66, $p = 0.4857$). The mean birth weight of 3.151 ± 0.5562 kg was recorded among women with BV does not appear to be different from the mean birth weight of 3.074 ± 0.4629 kg recorded among women without BV ($p = 0.5707$). Multivariable regression analysis did not demonstrate any association between age (t ratio = 0.3400, $p = 0.7393$), gravidity (t ratio = 1.234, $p = 0.2388$) and parity (t ratio = 0.8006, $p = 0.4378$) among women with BV.

DISCUSSION

BV has for over 100 years been reported among pregnant women and in the general women population with similar prevalence and incidence. Documented reports have put the prevalence of BV ranging from 16% to 32% (Hillier *et al.*, 1992, 1995; Kurki *et al.*, 1992; Gratacos *et al.*, 1998). The prevalence of 25% reported in our study agrees with reports from different parts of the world (Hillier *et al.*, 1992, 1995; Kurki *et al.*, 1992; Gratacos *et al.*, 1998). Most investigators used the clinical definition for BV that is based on the composite criteria of Amsel *et al.* (1983) to make a diagnosis. These clinical diagnostic criteria have been shown to correlate well with Gram staining of vaginal fluid for diagnosis of BV (Schwebke *et al.*, 1996). An overall agreement rate of 94.1% between Amsel clinical criteria and Spiegel Gram morphology found in our study agrees with previous reports (Schwebke *et al.*, 1996; Krohn *et al.*, 1989).

Although some reports have found BV to occur more commonly among unmarried blacks, women with multiple sexual partners, women using intrauterine contraceptive device and in women who regularly douche (Hillier *et al.*, 1995) this was not the case in our study as most of the women with BV (94%) were married and monogamous and do not douche or use intrauterine device. Also age, gravidity and parity had no significant effect on pregnancy outcome in this study.

Several reports have linked BV with low birth weight, preterm labour, PROM, preterm birth, chorio-amnionitis and post cesarean or post partum endometritis (McGregor *et al.*, 1995; Boggess *et al.*, 1996; Krohn *et al.*, 1995; Hillier *et al.*, 1995; Watt *et al.*, 1989, 1990). Some researchers (Priestly *et al.*, 1994; Yoong, 1994) have however cautioned that a causal effect between BV and preterm delivery or low birth weight is yet to be shown. Our study

did not show any significant association between BV and preterm delivery or low birth weight, two criteria we used as a measure of pregnancy outcome. It is worth to note that in selecting our sample, we strictly excluded women with obstetric complications or medical conditions that could influence pregnancy outcomes and therefore believed our findings to be accurate. In addition, most of the women with BV in our series were asymptomatic.

Our findings do not support the assumption that all pregnant women with BV especially the asymptomatic ones of which our study group belonged to should be treated as recommended by some researchers (Joesoef *et al.*, 1999) but are in agreement with reports from randomized controlled trials of BV treatment in pregnancy that examined the effectiveness and harms of treatment in USA that asymptomatic women do not benefit from treatment compared with those that were not treated (Jeanne *et al.*, 2001, The U.S. Preventive Services Task Force-USPSTF, 2001).

We believe this may lead to unnecessary antibiotic treatment with the attendant risks of neonatal infections and teratogenicity credited to some of the drugs used to treat BV (Cantu and Garcia, 1982; Greenberg, 1985; Emilia *et al.*, 2002). We suggest a multicenter study, involving larger population, to ascertain the effects of BV on pregnancy outcome in this environment.

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