

Bacterial Vaginosis

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Abstract

Objective: To estimate the frequency of bacterial vaginosis in women with preterm labour.

Methods: Descriptive cross sectional study carried out in department of Obstetrics and Gynaecology, Military Hospital and Army Medical College Laboratory, Rawalpindi. Non-probability convenience sampling was used and the study was completed in 12 months (from 1st January 2007 — 1st January 2008).

Hundred patients in preterm labour were included in the study. An objective diagnosis of the type of discharge was made. The vaginal pH of the discharge was measured. Samples for bacterial culture were obtained. A wet smear of the vaginal secretions was made and examined under the microscope for clue cells followed by Whiff test. All information was recorded on a specially designed proforma and the frequency of patients with bacterial vaginosis was estimated.

Results: A diagnosis of bacterial vaginosis was made in 21% of the patients by the Amsels criteria. However, culture report suggested bacterial vaginosis in 18% of cases with most of the cases (56%) having normal flora. Overall, incidence of infection was 44% in patients with preterm labour.

Conclusion: The frequency of bacterial vaginosis in our study was found to be 21% in preterm labour (JPMA 59:601; 2009).

Introduction

Preterm birth and its consequences remain a major health problem. The incidence is reported to be 8-10 % causing increased perinatal morbidity and mortality and subsequent neurodevelopmental problems such as cerebral palsy.¹ The aetiology of preterm birth is multifactorial but there is now well accepted evidence to implicate infection as a cause in upto 40% of cases.² Preterm labour due to infection is refractory to the use of tocolytic agents. A number of urogenital tract infections are known to increase risk for preterm birth. The microecologic condition that characterizes bacterial vaginosis includes replacement of normal protective vaginal flora (*Lactobacillus crispatis*, *Lactobacillus jensenii*) with an overgrowth of numerous bacteria with

high potential for tissue invasion and inflammatory response. Co-infection with sexually transmitted infection leads to further activation of immune responses. The process of tissue invasion and inflammation produces enzymes and immune stimulators (cytokines) in the vagina and uterus that may promote cervical ripening and weakening of foetal membranes. Stimulation of the immune protection response also results in prostaglandin production that increases uterine contractions.

Bacterial vaginosis (BV) is defined as a polymicrobial condition characterized by replacement of normally dominant lactobacilli by an overgrowth of anaerobic commensals in the vagina which includes microorganisms like *Gardnerella Vaginalis*, *Mobilincus*, *Mycoplasma Hominis*, *Ureaplasma*

Urealyticum and Prevotella.³ The term bacterial vaginosis was adopted to reflect the polymicrobial alteration in vaginal flora causing an increase in vaginal pH, sometimes associated with an homogenous discharge, but in the absence of a demonstrable inflammatory response.⁴

Women with symptomatic bacterial vaginosis usually present with a thin, gray-white, homogeneous discharge that tends to adhere to the vaginal wall.⁵ Vulvar pruritis and/or irritation is not common with BV; however, it may occur.⁶ The characteristic fishy odour results primarily from metabolic by-products of anaerobic bacteria. The odour is usually more noticeable after menses and intercourse due to the alkalinity of blood and semen.⁶ In whiff test the amine release that produces the sharp or fishy odour associated with bacterial vaginosis can be reproduced in the clinic by the addition of potassium hydroxide (KOH) to vaginal fluid. Luni Y⁷ in a study at Agha Khan University hospital concluded that the Amsel criteria for the diagnosis of bacterial vaginosis is rapid, reliable and an inexpensive method of diagnosis. The presence of clue cells signifies the presence of disease with 90% or greater specificity. In a local study by Shabbir et al⁸ at PMRC Lahore, pH and amine test were found to be rapid and inexpensive methods of diagnosing bacterial vaginosis.

Keeping in view the high complication rate associated with preterm birth and the importance of recognizing and diagnosing intrauterine infection, a study was designed and conducted in the labour ward of MH Rawalpindi to determine the frequency of bacterial vaginosis in cases of preterm labour.

Subjects and Methods

It was a descriptive cross sectional study including all pregnant women from 24 weeks gestation onwards and before 37 completed weeks of pregnancy with a singleton pregnancy and cervical dilatation of ≥ 3 cm with labour pains.

The exclusion criteria were pregnancy with medical disorders, Polyhydramnios and cervical incompetence.

All women found eligible for the study were registered. Demographic information like age, parity and gravidity were recorded. Hundred patients reporting in preterm labour were included. Fundal height, foetal lie and foetal heart sounds were also noted. Pelvic examination was done to confirm preterm labour. Cervical dilatation was noted along with the presence or absence of leaking.

Any vaginal discharge was noted by exposing the vagina with a sterile non lubricated vaginal

speculum. An objective diagnosis of the type of discharge was made. The vaginal pH was measured half way down the lateral vaginal wall by means of a narrow range pH strip.

Samples for bacterial culture were obtained by rotating a sterile cotton swab over the lateral vaginal wall and then placing in Stuart's transport medium until further processing. A wet smear of the vaginal secretions was made and seen under the microscope for the presence of clue cells. Whiff test was performed by placing a few drops of 10% KOH on a glass slide mixed with the discharge; a rotten fish odour rendered the amine test (Whiff test) positive. Baseline investigations like complete blood picture, urine and timed blood sugar examination were recorded. All this information was recorded on a specially designed proforma. Three of four criteria were met to establish accurate diagnosis of bacterial vaginosis in most of the affected women i.e. homogeneous vaginal discharge, the "whiff test", presence of clue cells (greater than 20%) and vaginal pH greater than 4.5. The collected data was entered into SPSS version 12 for analysis.

Results

The number of admissions in the labour ward during that period were 4857. The number of women diagnosed with preterm labour were 378. Out of these, 100 patients were selected for this study as they fulfilled the inclusion criteria.

The rate of preterm labour is about 7.8% in our set up, bacterial vaginosis was detected by Amsel's criteria in 21%. Patients with a pH > 4.5 were 27% (Figure-1).

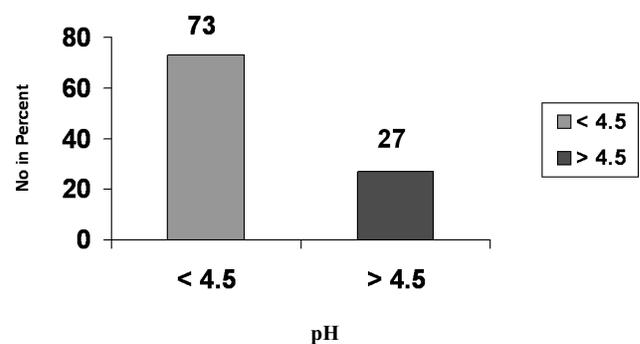


Figure-1: pH of Vaginal discharge (n=100).

Patient with preterm labour and a positive Whiff (Amine) test was 63%. Vaginal discharge was present in 86% of the patients. It was homogenous and milky white in 59% cases. Four percent of the patients had a green and frothy discharge while 23% of the patients had a discharge which

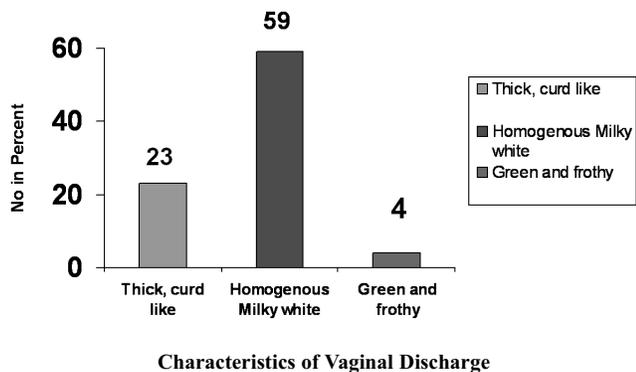


Figure-2: Characteristics of Vaginal Discharge (n=100).

was thick, and curd like (Figure-2). Clue cells was diagnosed on a wet smear in 25% of the patients. The detection of clue cells on direct microscopy is the single most sensitive and specific criterion for the diagnosis of bacterial vaginosis and is regarded as pathognomonic of bacterial vaginosis. The presence of clue cells signifies the presence of disease with 90% or greater specificity. Out of the 100 patients, 18 had growth of *Mycoplasma hominis* and *Gardnerella vaginalis* and were thus labeled positive for

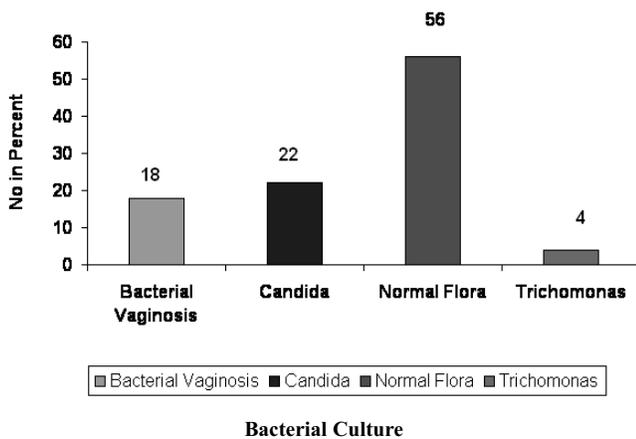


Figure-3: Bacterial Culture (n=100).

bacterial vaginosis. Four cases showed the growth of *Trichomonas vaginalis*. *Candida* was present in 22% of the cultures while 56% of the patients had normal vaginal flora (Figure-3). The culture report was positive in lesser number of patients compared to the Amsel's criteria.

Discussion

Preterm labour (PTL) and preterm premature rupture of membranes (PPROM) have strongly been linked with bacterial vaginosis. Abnormal mid trimester flora is predictive of preterm birth (PTB). Similarly

chorioamnionitis, a complication of 1% of all pregnancies, has also been linked with bacterial vaginosis and so is postpartum endometritis, which is 10 times higher in patients with bacterial vaginosis than in women with normal flora. Pregnant women with bacterial vaginosis are likely to deliver low birth weight babies. Luni Y⁷ in Agha Khan University hospital studied the prevalence of bacterial vaginosis in pregnant and non pregnant women both symptomatic and asymptomatic, with vaginal discharge and had 16.1% of patients diagnosed with bacterial vaginosis. In another study by Sami S and Baloch S⁹ in Bolan medical Complex hospital Quetta bacterial vaginosis was diagnosed in 30.7% of both symptomatic and asymptomatic patients. Incidence of bacterial vaginosis in obstetric patients however varies and could be quite high like that observed by Tariq N¹⁰ in Holy Family Hospital where it was 68%. Two separate appraisals by Lamont¹¹ and Vingneswaran¹² were supportive of the treatment of bacterial vaginosis as an effective preventive measure for PPROM.

In 2003 meta-analysis of studies involving 20232 women showed that bacterial vaginosis doubles the risk of preterm delivery.¹³ It is possible that variations in the degree of virulence of the microorganisms exist and more likely a difference in the immune response, by the host against the infection may determine the severity of the condition.¹⁴

Women with bacterial vaginosis are often asymptomatic but can present with the complaints of malodorous vaginal discharge. The prevalence of bacterial vaginosis among nonpregnant women ranges from 15 percent to 30 percent; up to 50 percent of pregnant women have been found to have bacterial vaginosis.¹⁵ Aslam M et al¹⁶ at Jinnah Hospital Lahore diagnosed bacterial vaginosis in 18.7% of the pregnant women who presented with vaginal discharge. The incidence of bacterial vaginosis in obstetric patients however varies and could be quite high like that observed by Tariq N¹⁰ in Holy Family Hospital where it was diagnosed in 68% of the patients. However, the majority of cases of BV are asymptomatic and remain unreported and untreated. The prevalence of bacterial vaginosis in high risk pregnant women has been estimated to be as high as 45%. The treatment of these high risk, BV positive pregnant women has resulted in reduction of PTB by 37-50%.^{4,17} Two well described diagnostic methods for bacterial vaginosis are clinical or wet smear diagnosis (Amsel criteria) and Gram stain diagnosis (Nugent criteria).

Only a subgroup of women is truly at risk for infection associated preterm birth. Infectious diseases

and their consequences result not only from the ill-effect of microbial invasion but also the nature of host response. The 'optimal' host is capable of mounting a measured and proportionate inflammatory response, which can deal with changes in the vaginal ecosystem without paying the price of adverse pregnancy outcome. The genetic profile of these women, the gene/environment interaction and the relationship between changes in the vaginal ecosystem/vaginal inflammation and host cells are interesting areas for future research.¹⁴

In Cochrane review, four meta-analyses of trials involving the screening and treatment of bacterial vaginosis in pregnancy have been published in the past 4 years. All have shown no reduction in preterm birth with treatment for bacterial vaginosis. In the continuing Cochrane Review of antibiotics for treating bacterial vaginosis in pregnancy, an analysis of 13 high-quality trials involving 5300 women found that antibiotic treatment was effective in eradicating bacterial vaginosis in pregnant women, but did not significantly reduce the risk of preterm birth, PPRM or subsequent preterm birth in women with a previous preterm birth.¹³

Varma and Gupta in 2006 undertook a repeat meta-analysis of screening and treating bacterial vaginosis in pregnancy.¹⁸ The results of this analysis suggested a reduction in the incidence of preterm birth following screening and treatment for bacterial vaginosis in low-risk women but not in high-risk women, an apparent contradiction as one would normally expect treatment to exert greater risk reduction in the higher risk group.

The recommendations of the Centers for Disease Control and Prevention for the treatment of bacterial vaginosis suggest the use of either metronidazole or clindamycin. Yet four studies in low-risk women have shown a statistically significant reduction in the incidence of preterm birth when bacterial vaginosis was treated with clindamycin in early pregnancy.

Conclusion

Symptomatic bacterial vaginosis is prevalent among pregnant women. However, true magnitude is not known because more than half of bacterial vaginosis cases are asymptomatic. A highly variable percentage of women with the diagnosis of preterm labour have bacterial vaginosis.

Patients with history of preterm labour and preterm birth should be screened for bacterial vaginosis and if positive, treated. Expertise of the clinician in identifying bacterial vaginosis is necessary to eliminate frustrating vaginal symptoms and to prevent possible complications like preterm labour and preterm birth.

Hence, screening and treatment of bacterial vaginosis in high-risk women is advocated in early pregnancy. Low risk group requires, treatment if abnormal genital flora are present. In future, it may be appropriate to screen low risk women if trials demonstrate some benefit of early treatment.

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