Preliminary Report

Prevalence of Bacterial Vaginosis in Thai Pregnant Women with Preterm Labor in Siriraj Hospital

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Objective: *To study the prevalence of bacterial vaginosis (BV) in pregnant women with preterm labor in Siriraj hospital.*
Material and Method: *A cross-sectional study of 158 pregnant women with suspected preterm labor was performed between January and July 2005. The subjects enrolled in the present study were between 28^{+0} and 36^{+6} menstrual weeks. BV blue test was performed on the vaginal fluid collected from lower one- third of vagina.*
Results: *The prevalence of BV in women in the preterm labor group was 25.8% compared to 14.1% in the preterm contraction group ($p = 0.07$).*
Conclusion: *Compared with preterm contractions a higher prevalence of BV was found in the pregnant women with preterm labor. Given that a quarter of pregnant women with preterm labor tested positive for BV, it might be appropriate to perform this test in the triage setting.*

Keywords: *Spontaneous preterm labor, Preterm contractions, BV blue test, Bacterial vaginosis, Prevalence, Siriraj Hospital*

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Preterm birth remains one of the most serious problems in obstetric care. It is a leading cause of neonatal morbidity and mortality. The cause of spontaneous preterm birth is still elusive. Global literature suggests that asymptomatic or minimally symptomatic infections are related to premature births[1]. Bacterial vaginosis (BV) is believed to be a risk factor for preterm delivery, as well as being associated with peripartum complications such as preterm premature rupture of membranes (PPROM), chorioamnionitis, and postpartum endometritis.

BV is a condition characterized by a change in the microbial ecosystem of the vagina. This is characterized by a decrease in the number of Lactobacilli and overgrowth of several anaerobes or facultative bacteria such as Mobiluncus species, Prevotella species, Gardnerella vaginalis, and genital mycoplasma[2,3]. The prevalence of BV varies from 14% to 21% in western country[4-7]. In Asia, the prevalence of BV during pregnancy is 13.6% in Japan and reported prevalence in Thailand is about 15.9%[8]. However, the true prevalence of BV in Thai pregnant women with preterm labor is not known. The present study aimed to determine the prevalence of BV in these women in Siriraj Hospital. In addition, the relationship between BV and neonatal outcomes were also investigated.

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Material and Method

The present cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Bangkok, Thailand between January and July 2005 after the approval of an internal ethical committee board. A total of 158 pregnant women between 28^{+0} and 36^{+6} menstrual weeks who were admitted due to a complaint of regular uterine contractions of 8-minute interval or less were enrolled. The authors excluded patients with medically complicated pregnancy (e.g., gestational diabetes, hypertension), and pregnancy with preterm premature

rupture of membranes (PPROM), multifetal gestation, and the patients who presented with mucous bloody show. BV in the present study was diagnosed using BV blue test.

Pelvic examination was performed after the informed consent was signed. A vagina speculum was lubricated with sterile water and vaginal fluid was collected from lower one-third of the vaginal wall with one cotton swab for the FDA-approved BV blue test (Gryphus Diagnostics, L.L.C. Birmingham, USA). The sample cotton swab was inserted in the BV-blue testing vessel and incubated for 10 minutes at room temperature. Two drops of BV-blue developer solution were added, and then the color reaction was immediately read. A blue or green color indicated the example contained an elevated level of sialidase and was therefore positive. A yellow color indicated a negative result or no increase in sialidase activity, after that digital cervical examination was performed. Pregnant women who had the following; progressive cervical change, > 1 cm of cervical dilatation, and > 80% of cervical effacement were classified as preterm labor (PL)[9] otherwise, they were classified as preterm contractions (PC)[10]. Steriod and tocolytic were administered in many cases of PL and PC groups that had a gestational age less than 34 weeks. All pregnant women with BV infection were treated with oral metronidazole 250 mg three times a day for 7 days.

Statistical analysis

Descriptive statistics, including means and standard deviations (SDs), were generated for all continuous variables, and frequencies were generated for discrete variables. All analyses were performed using SPSS version 11. Statistical significance was assigned for p value of 0.05 or less. Chi-square test was used to assess the difference of the prevalence of BV in each studied group. In addition, continuous variables in each studied group were compared by using Student t-test.

Results

Mean (± SD) maternal age and gestational age of the participants in both BV positive and negative group were about 26 years and 32 weeks, respectively. In the PL group, there were 13 BV-positive patients and 46 BV-negative patients in delivery at first admission group. In non-delivery at first admission group, BV-positive and negative accounted for four and three patients, respectively. All the patients in PC group were not delivered at first admission. Furthermore, 13 BV positive and 79 BV-negative patients were in non-delivery at first admission (Table 1).

Table 2 shows the prevalence of BV in the present study. Nineteen percent of the subjects coming in complaining of suspected preterm labor were positive for BV. After categorizing the patients into PL and PC, the authors found that 25.8% of the patients with PL were positive for BV, whereas 14.1% of the patients with PC were positive. This difference, however, did not reach statistical significance level ($p = 0.07$). The prevalence of BV did not differ in the patients at $28\text{-}33^{+6}$ menstrual weeks and the patients at $34^{+0}\text{-}36^{+6}$ menstrual weeks as shown in Table 2.

Comparison of neonatal outcomes between pregnant women with BV and without BV in the groups of delivery at first admission and non-delivery at first admission is shown in Table 3. In the first group, 59 cases delivered during the first admission. Mean GA was about 33 weeks in BV-positive and BV-negative group and there were no significant differences in terms of birth weight, asphyxia, and NICU admission rate between pregnant women with BV and without BV. Due to 20 cases lost to follow-up in the second group, there were 79 cases coming to deliver later. Mean GA was

Table 1. Demographic characteristics

Characteristics	BV positive	BV negative
Mean age SD (years)	26.37±6.50	25.81±5.84
Mean gestational age SD (weeks)	32.90±2.38	32.93±2.37
Parity: Nulliparous	22 (73.3%)	81 (63.3%)
Multiparous	8 (26.7%)	47 (36.7%)
Preterm labor:		
Delivery at 1st admission	13 (76.5%)	46 (93.8%)
Non-delivery at1stadmission	4 (23.5%)	3 (6.2%)
Preterm contraction		
Delivery at 1st admission	0	0
Non-delivery at 1st admission	13 (100%)	79 (100%)

Table 2. The prevalence of bacterial vaginosis

Group	Bacterial vaginosis		p-value
	Positive (%)	Negative (%)	
All cases	30 (19.0)	128 (81.0)	
Preterm labor	17 (25.8)	49 (74.2)	0.07
Preterm contractions	13 (14.1)	79 (85.9)	
Gestational age:			
28-33^{+6} weeks	15 (9.4)	65 (41.13)	
34-36^{+6} weeks	15 (9.4)	63 (39.8)	

Table 3. Comparison of neonatal outcome between pregnant women with bacterial vaginosis and without bacterial vaginosis in Preterm delivery at 1stadmission and non-delivery at 1stadmission

Group	Bacterial vaginosis		
	Positive cases (%)	Negative cases (%)	p-value
Delivery at 1stadmission (delivery at 1stadmission of preterm labor group)	13 (22)	46 (78)	
Mean GA (weeks$\pm$ SD)	33.5$\pm$2.6	33.6$\pm$2.1	0.88
Body weight (gm $\pm$ SD)	2,136.15$\pm$574	2,214.71$\pm$523	0.64
< 2,500	9 (69.2)	32 (69.6)	0.98
> 2,500	4 (30.8)	14 (30.4)	
Asphyxia	0	3 (6.9)	0.00
NICU	1 (7.7)	6 (13.1)	0.00
Non-delivery at 1stadmission* (preterm contraction group and non delivery at 1stadmission of preterm labor group)	14 (17.7)	65 (82.3)	
Delivery at GA (weeks $\pm$ SD)	36.9$\pm$1.7	37.2$\pm$2.18	0.61
Body weight (gm $\pm$ SD)	2,737.1$\pm$460	2,829$\pm$443	0.50
< 2,500	6 (42.9)	15 (23.1)	0.13
> 2,500	8 (57.1)	50 (76.9)	
Asphyxia	0	0	
NICU	0	0	
Total	27	111	

* 20 out 0f 119 cases in the Non-delivery at 1stadmission group were lost to follow up

about 37 weeks in both groups. The authors found LBW to be 43% in BV positive group whereas 23% in BV negative group. However, this percentage difference was not statistically significant. Not all puerperal morbidities were collected in the present study.

Discussion

Preterm birth has been a major cause of neonatal morbidity for a long time. Strategies to prevent this have not been appreciably successful due to elusive, perhaps multifactorial origins of this disorder. BV has been linked to preterm births, as well as a number of puerperal complications. In Thailand, a study reported about the prevalence of BV in pregnant women using Amsel's criteria that was about 15.9%. The authors reported a high prevalence of BV among Thai pregnant women coming in with suspected preterm labor[8]. The prevalence was marginally higher in the established cases of preterm labor, based on cervical changes. However, the authors did not find significantly different

adverse perinatal outcomes in the babies born from both BV-positive and negative mothers, when the other confounders were controlled.

BV is a condition associated with proliferation of anaerobic microorganisms producing hydrolytic enzymes, including sialidase and prolidase[11]. Using the substrates in the decidua, prostaglandin synthesis was enhanced, resulting in premature uterine contractions, cervical changes, and rupture of fetal membranes. The diagnosis of BV is generally performed by using the Amsel's criteria. Evaluating gram's strain vaginal smears traditionally scored by using the Nugent system also aids in the identification of BV[12,13]. This requires expensive equipment and well-trained or experienced personnel, therefore, is not readily available in labor and delivery suites. So, the BV Blue test was used in the present study as an alternative rapid test to detect sialidase enzyme[12]. This convenient FDA approved test has the same comparable accuracy as that of the Amsel's criteria[12]. Higher prevalence of BV among women with cervical changes agrees with the previous reports.

Although there were seven cases, initially diagnosed as PL and discharged without delivery at first admission, all of them finally came for preterm delivery at the second admission. It may be because of the administration of tocolytic drugs in all cases diagnosed as PL.

BV has also been linked to several puerperal morbidities, including fever, and endometritis. They were none in the present series because all of the pregnant women with BV infection were treated. The authors found the percentage in LBW to be higher in BV-positive than in BV-negative group among those who deliver later, although this percentage difference was not statistically significant. It might be the result of the administration of steroid and tocolytic drugs and treatment of BV. In additional, too small a sample size and low incidence of asphyxia and rate of NICU admission are other causes. In addition, 20 cases enrolled in the present study did not deliver at the study center or at the affiliated hospital. While the present data were informative in terms of the prevalence report, the authors need a more stringent follow-up scheme, as well as enrolling more patients to determine conclusively the maternal and neonatal morbidities of these organisms.

In conclusion, the authors reported a higher prevalence of BV in pregnant women with established preterm labor. However, whether the mother with preterm labor might gain some benefit from this rapid BV test, and consequently, prompt antibiotics treatment, is yet to be determined. An ongoing data collection is underway, but in the meantime, the authors advocate the BV testing in our labor and delivery unit in an attempt to recognize promptly this condition, and start therapy immediately.

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ความชุกของภาวะแบคทีเรียลวาไจโนสิสในสตรีไทยที่ตั้งครรภ์และมีภาวะเจ็บครรภ์คลอดก่อนกำหนดในโรงพยาบาล ศิริราช

อวรรษนันต์ ฐานะวุฑฒ์, อัมพัน เฉลิมโชคเจริญกิจ, ดิฐกานต์ บริบูรณ์หิรัญสาร, ราตรี ศิริสมบูรณ์, กาญจนา พิมล

วัตถุประสงค์*: เพื่อการศึกษาความชุกของภาวะแบคทีเรียลวาไจโนสิส ในสตรีไทยที่มีภาวะเจ็บครรภ์คลอดก่อนกำหนดในโรงพยาบาล ศิริราช*

วัสดุและวิธีการ*: เป็นการศึกษาแบบตัดขวางในสตรีตั้งครรภ์ที่มาด้วยภาวะสงสัยว่าจะมีภาวะเจ็บครรภ์ คลอดก่อนกำหนดจำนวน 158 รายโดยมีอายุครรภ์ระหว่าง28-36สัปดาห์ในห้องคลอดภาควิชา สูติศาสตร์-นรีเวชวิทยา โรงพยาบาลศิริราช ระหว่างเดือนมกราคมถึงเดือนกรกฎาคม พ.ศ. 2548 โดยจะเก็บตัวอย่างสารคัดหลั่งในช่องคลอดมาตรวจ โดยใช้ "BV blue test"*

ผลการศึกษา*: พบว่าความชุกของภาวะแบคทีเรียวาไจโนสิส ในกลุ่มสตรีที่มีภาวะเจ็บครรภ์คลอดก่อนกำหนดจริงและในกลุ่มสตรีตั้งครรภ์ที่ได้รับการวินิจฉัยว่าเป็นเพียงภาวะมดลูกหดรัดตัวก่อนกำหนด คิดเป็นร้อยละ 25.8 และ 14.1 ตามลำดับ แต่ไม่พบว่ามีนัยสำคัญทางสถิติ*

สรุป*: แม้ความชุกของภาวะแบคทีเรียลวาไจโนสิสในสตรีที่เจ็บครรภ์คลอดก่อนกำหนดจะสูงกว่าแต่ไม่มีนัยสำคัญทางสถิติ อย่างไรก็ตามพบว่าประมาณหนึ่งในสี่ของผู้ป่วยที่มาด้วยอาการเจ็บครรภ์คลอดก่อนกำหนดจริง มีภาวะนี้ การตรวจหาภาวะนี้ในสตรีตั้งครรภ์กลุ่มนี้น่าจะมีประโยชน์*