Bacterial Vaginosis in Threatened Preterm, Preterm and Term Labour

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Objective: *To present the prevalence of bacterial vaginosis in threatened preterm, preterm, and term labor and results after treatment.*
Material and Method: *Forty-four, 50, and 56 pregnant women with threatened preterm, preterm, and term labor, respectively were participated. Bacterial vaginosis was diagnosed by Amsel's criteria. Treatment by metronidazole or clindamycin was used. A case record form recorded maternal age, obstetric history, gestational age at admission and delivery, examination data, the route of delivery, and the newborn birth weight and conditions.*
Results: *The patients in threatened preterm labor group had significantly positive bacterial vaginosis when compared to those in the term labor group.*
Conclusion: *Prevalence of bacterial vaginosis in threatened preterm, preterm, and term labor were presented. The prevalence of bacterial vaginosis in both preterm labor groups was higher than in the term labor group.*

Keywords: *Bacterial vaginosis, Threatened preterm labor, Preterm labor, Term labor*

J Med Assoc Thai 2010; 93 (12): 1351-5
Full text. e-Journal: *http://www.mat.or.th/journal*

Preterm labor is still the major cause of perinatal morbidity and mortality. Around 30% of threatened preterm labor was preterm labor. In Siriraj Hospital, the incidence of preterm and threatened preterm labor is about 12.9% and 1.2%, respectively[1]. Spontaneous preterm labor is mostly found approximately 30-50% and bacterial vaginosis is one of the many causes of preterm labor. Pregnancy with bacterial vaginosis is a higher risk for preterm delivery[2]. Screening and treating asymptomatic pregnant women, particularly those that have a history of previous preterm delivery, would be beneficial for minimizing preterm delivery[3]. There may be benefits to screening and treating those pregnant women, but there are insufficient data to recommend this as a routine practice[4,5]. All pregnant women with symptomatic BV should be treated with metronidazole or clindamycin to relieve bothersome symptoms[3].

However, there was no comparison data of bacterial vaginosis that was found in threatened preterm, preterm, and term pregnancy. The present study presents the association between bacterial vaginosis and threatened preterm, preterm and term labor and the results after treatment.

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Material and Method

The present study was approved by Siriraj Ethics Committee of the Faculty of Medicine Siriraj Hospital. The sample size using power and precision analysis formula was calculated by the incidence of threatened preterm labor at Siriraj Hospital, which was about 1.3%/year[1] (assuming n = 50 per group and alpha =.05, 2 tailed). One hundred and fifty singleton pregnant women with threatened preterm, preterm, and term labor between August 1, 2008 and July 31, 2009 participated in the present study. The gestational age was calculated from the first day of the last menstrual period and confirmed by crown-rump length

measurement before 14 weeks of gestation[6]. If the estimated gestational age by menstrual and ultrasound estimation were different for more than seven days, the ultrasound estimation was used.

The first group was the patients with threatened preterm labor who had regular uterine contractions occurring at the frequency of at least one time in 10 minutes with no effacement and dilatation of cervix between 20-37 weeks. The examination was taken at least 30 minutes[7]. The second group was the patient with preterm labor, between 20-37 weeks, who had regular uterine contractions four times in 20 minutes or eight times in 60 minutes with progressive cervical dilatation greater than 1 cm and effacement at least 80%[8]. The third group was the patient with term labor who had regular painful uterine contraction after 37 weeks.

The patients who had bloody discharge, leakage of amniotic fluid or clear causes of preterm labor (*e.g.* multiple pregnancy, hydramnios) were excluded from the study. Forty-four, 50, and 56 cases according to the defined criteria were included in the first, second and third group, respectively.

All studied patients underwent a gynecologic examination. The unlubricated vaginal speculum was used and vaginal discharge was taken for Amsel's diagnostic criteria[9]. The criteria included grayish, thin, and/or malodorous discharge, pH measured by pH paper test, in vaginal cul de sac > 4.5, presented of fishy odor after addition of a drop of 10% KOH onto vaginal swab and positive microscopic wet smear to search for clue cells[10,11]. Bacterial vaginosis was diagnosed when at least three of the four Amsel's criteria were positive[9]. The antibiotic treatment by metronidazole (400 mg every 12 hours for seven days) or clindamycin (300 mg every 8 hours for seven days), in case of allergy to metronidazole, was determined by the physician in each case. The treatments for threatened preterm and preterm labor were bed rest and tocolytic drugs, respectively.

A case record form recorded maternal age, obstetrics history, gestational age of admission, examination data, gestational age at delivery, the route of delivery, and the newborn birth weight and conditions.

Statistical analysis

SPSS version 13 was used to analyze data. Chi-square, one-way ANOVA, Post Hoc, and Kruskal-Wallis test were used to compare the results of testing and prevalence of bacterial vaginosis in three groups of patients. Results were reported as means, standard deviations (SD), or percentages. All tests were two-tailed and defined significance as $p < 0.05$.

Results

During the present study period, 150 patients were included in the present study. Forty-four, 50, and 56 patients met the defined criteria of threatened preterm, preterm, and term labor. The maternal age, obstetric history, and gestational age at admission are concluded in Table 1. The maternal age and obstetric history are not different.

By the clinical examination, a positive KOH test, pH > 4.5, and clue cells were more common among preterm labor than term labor (Table 2). The patients (16/44, 36.4%) in the threatened preterm labor group had significantly positive bacterial vaginosis by

Table 1. Maternal age, obstetrics history and gestational age at admission between threatened preterm, preterm and term labour

Demographic data		Threatened prerterm labour (n = 44)	Preterm labour (n = 50)	Term labour (n = 56)
Mean maternal age		25.1 ± 5.7 (14-36)	26.7 ± 7.0 (17-44)	26.6 ± 5.7 (15-38)
Gravida	1	24 (54.5%)	30 (60%)	29 (51.8%)
	> 1	20 (45.5%)	20 (40%)	27 (48.2%)
Parity	0	24 (54.5%)	30 (60%)	29 (51.8%)
	1	5 (11.4%)	32 (64%)	4 (7.1%)
	> 1	15 (34.1%)	18 (36%)	23 (41.1%)
Abortion	0	24 (54.5%)	30 (60%)	29 (51.8%)
	1	11 (25.0%)	16 (32%)	17 (30.4%)
	> 1	9 (20.5%)	4 (8%)	10 (17.8%)
Mean gestational age at admission (weeks)		32.6 ± 2.4 (28-36)	33.6 ± 1.9 (29-36)	38.6 ± 1.2 (37-41)

Table 2. Results of testing for bacterial vaginosis according to each group

Amsel's criteria	Threatened prerterm labour (n = 44)	Preterm labour (n = 50)	Term labour (n = 56)	p-value
Suggestive discharge	10 (22.7%)	12 (24%)	14 (25%)	<0.05
Positive KOH test	14 (31.8%)	10 (20%)	6 (10.7%)	<0.05
PH > 4.5	30 (68.2%)	35 (70%)	15 (26.8%)	<0.05
Clue cells	16 (36.4%)	15 (30%)	9 (16.1%)	<0.05
≥ 3 Amsel's criteria	16 (36.4%)	15 (30%)	9 (16.1%)	<0.05

Statistical significance when p-value ≤ 0.05

Table 3. Significance of bacterial vaginosis between threatened preterm, preterm and term labour

	Threatened preterm labour	Preterm labour	Term labour
Threatened preterm labour	-	-	p-value = 0.02*
Preterm labour	p-value = 1.3	-	-
Term labour	-	p-value = 0.08	-

* Statistical significance when p-value ≤ 0.05

Amsel's clinical criteria when compared to those in the term labor group ($p < 0.05$) (Table 3). Threatened preterm and preterm labor were combined to analyze the prevalence of bacterial vaginosis in all pregnant women with premature uterine contraction. However, the prevalence of bacterial vaginosis in all the preterm labor group was higher than the term labor group with statistical significance ($p < 0.05$) (Table 4).

All 40 patients (16, 15, and 9 cases in threatened preterm, preterm, and term labor) with clinical signs of bacterial vaginosis, received antibiotic treatment with metronidazole orally, 2 gram per day for seven days. Drug allergy was not found in any of the patients.

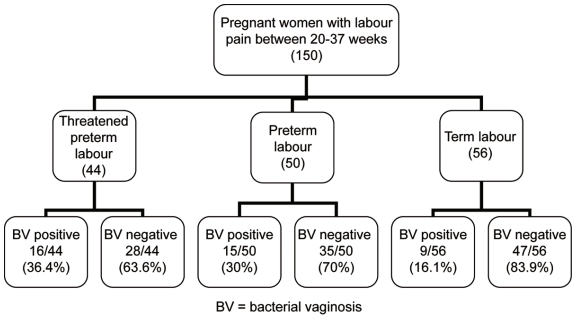

Fig. 1 Results of bacterial vaginosis screening in each group of patients

Table 4. Prevalence and significance of bacterial vaginosis between preterm and term labour

Bacterial vaginosis	Preterm labour	Term labour	p-value
Positive	31/94 (33%)	9/56 (16.1%)	<0.05
Negative	63/94 (67%)	47/56 (83.9%)	<0.05

Statistical significance when p-value ≤ 0.05

Discussion

Bacterial vaginosis consisted of a complex change in a reduction of normally dominant hydrogen-peroxide producing lactobacilli and an overgrowth of anaerobic bacteria including Gardnerella vaginalis, Mycoplasma hominis, Prevotella species, Porphyromonas species, Bacterides species, anaerobic Peptostreptococcus species, Fusobacterium species, and Atopobium vaginae[10]. Amsel's clinical criteria[9] is the most widely recognized and used as a routine test in Siriraj Hospital. The disadvantage of the test is the subjective visual and olfactory criteria. However, the clue cells that were found in all cases of bacterial vaginosis in the present study helped to confirm the definite diagnosis according to the Amsel's criteria. Therefore, solely clue cells can be used to confirm the diagnosis of bacterial vaginosis if clinical examination is uncertain.

In the present study, bacterial vaginosis was more common among threatened preterm pregnant patients than among term pregnant patients. The percentage of bacterial vaginosis in preterm labor was significantly higher than in term labor, which confirms the results of the previous case-control studies[12]. Most positive patients in all groups of this study had normal vaginal discharge that was asymptomatic. Fifty percent of asymptomatic pregnant women resolved spontaneously[13]. Treatment is indicated in symptomatic pregnant women. Even though bacterial vaginosis is associated with preterm birth, screening, and treatment of asymptomatic pregnant women is still controversial. A meta-analysis reported a statistically significant increased risk of preterm birth in asymptomatic pregnant women[12]. Most studies in general obstetric populations have not found that treatment of asymptomatic infection reduces the incidence of preterm labor or delivery, but this may not apply to women at high-risk for preterm birth.

All patients with bacterial vaginosis were treated with metronidazole, which could improve the result of delivery. Continued oral antibiotic therapy in women with positive bacterial vaginosis and at risk of preterm delivery may reduce preterm delivery before 37 weeks of gestation[14]. However, due to the ethical consideration, the non-treatment group cannot be allowed. Therefore, the effect of antibiotics for term or preterm birth could not be assessed. From the present study, the authors recommend bacterial vaginosis screening in both threatened preterm and preterm labor in order to minimize the preterm birth.

In conclusion, the present study showed that prevalence of bacterial vaginosis in threatened preterm and preterm labor was observed more often than in term labor. The testing for bacterial vaginosis and treating after diagnosis of threatened preterm and preterm labor may reduce the risk of preterm delivery. For the strong statistical significance, a large population and well-study design should be done.

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โรคแบคทีเรียลวาจิโนสิสในสตรีที่มีอาการเจ็บครรภ์คลอดก่อนกำหนดคุกคามเจ็บครรภ์คลอดก่อนกำหนดและครบกำหนด

สายฝน ชวาลไพบูลย์, กาญจนา พิมล

วัตถุประสงค์: *เพื่อแสดงให้เห็นถึงความชุกของโรคแบคทีเรียลวาจิโนสิสในสตรี ที่มีอาการเจ็บครรภ์คลอดก่อนกำหนดคุกคาม เจ็บครรภ์ก่อนกำหนดและครบกำหนด และผลหลังการรักษา*

วัสดุและวิธีการ: *ทำการศึกษาในสตรีตั้งครรภ์ที่มีอาการเจ็บครรภ์คลอดก่อนกำหนดคุกคาม เจ็บครรภ์ก่อนกำหนดและครบกำหนดจำนวน 44, 50 และ 56 ราย ทำการตรวจวินิจฉัยโรคแบคทีเรียลวาจิโนสิสโดยใช้ Amsel's criteria และให้การรักษาสตรีที่มีผลบวกจากการตรวจด้วยยาเมทโทรนิดาโซลหรือคลินดามัยซิน ทำการบันทึกข้อมูลอายุสตรีตั้งครรภ์ ประวัติทางสูติกรรม อายุครรภ์ที่เข้ารับการรักษา และอายุครรภ์ที่คลอด ผลการตรวจวิธีการคลอด น้ำหนักทารก และสภาพทารกแรกคลอด*

ผลการศึกษา: *สตรีตั้งครรภ์ที่มีภาวะเจ็บครรภ์คลอดก่อนกำหนดคุกคาม จะตรวจพบโรคแบคทีเรียลวาจิโนสิสสูงกว่าสตรีตั้งครรภ์ที่มีอาการเจ็บครรภ์ครบกำหนดอย่างมีนัยสำคัญทางสถิติ ความชุกของโรคแบคทีเรียลวาจิโนสิสในกลุ่มสตรีที่มีอาการเจ็บครรภ์ คลอดก่อนกำหนดจะสูงกว่าสตรีที่มีอาการเจ็บครรภ์ครบกำหนดอย่างมีนัยสำคัญทางสถิติ*

สรุป: *แสดงความชุกของโรคแบคทีเรียลวาจิโนสิสในกลุ่มสตรีที่มีอาการเจ็บครรภ์คลอดก่อนกำหนดคุกคามคลอดก่อนกำหนด และครบกำหนด*