

FEATURES OF VAGINAL MICROBIOCENOSIS IN PREGNANT WOMEN WITH THREATENED PREMATURE BIRTH

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Abstract

Preterm birth (PB) is one of the leading causes of perinatal morbidity and mortality. Disturbances in vaginal microbiocenosis, including bacterial vaginosis and aerobic vaginitis, play a key role in the pathogenesis of threatened preterm birth. In this study, changes in vaginal microflora, pH of the environment, and the results of liquid cytology were studied using 58 pregnant women as an example. Data on inflammatory changes in the vaginal epithelium and their relationship with microbiological disturbances are presented.

Keywords: Microbiocenosis, threatened premature birth, bacterial vaginosis, dysbiosis, liquid cytology, pregnancy.

Introduction

Preterm birth (PB) in the etiopathogenetic sense is a clinical syndrome characterized by polyetiology, participation of the fetus in the pathogenesis, a variety of clinical symptoms and the involvement of genetic and environmental factors [1–3]. According to epidemiological studies, the infectious factor is considered to be the leading one in the development of PB [4–6]. The central role in the induction of PB is assigned to intrauterine infection [7–9]. According to microbiological studies, 25–40% of preterm births are caused by intrauterine infection. Threatened preterm birth (TPB) is a serious complication of pregnancy, occurring in approximately 5–10% of pregnant women [10–13]. Disturbances in the vaginal microbiocenosis play a key role in their pathogenesis. Studies show that conditions such as bacterial vaginosis, candidiasis, and other forms of dysbiosis are associated with an increased risk of preterm birth, ascending infections, and inflammation of the fetal membranes [10–13]. Preterm birth remains one of the leading causes of perinatal mortality, as well as long-term health problems in newborns. Infections that occur against the background of vaginal microbiocenosis disorders play an important role in the pathogenesis of preterm birth. Studies show that bacterial vaginosis and aerobic vaginitis significantly increase the risk of preterm birth.

The purpose of this study is to investigate changes in the vaginal microbiocenosis and the state of the epithelium in pregnant women with the threat of premature birth, as well as to assess the relationship between inflammatory processes and various types of vaginal infections.



Materials and Methods

The study included 58 pregnant women aged 20 to 38 years with a threat of preterm labor at 24 to 36 weeks of gestation. All patients had clinical signs of a threat of preterm labor: shortening of the cervix and increased uterine tone. Only women without concomitant diseases that could affect the vaginal microbiocenosis were included.

The research methods included:

Bacterioscopy of vaginal smears to determine flora and its quantitative composition. Microbiological culture of smears for aerobic and anaerobic flora. Polymerase chain reaction (PCR) to identify key pathogens: Gardnerellavaginalis , ureaplasmaspp ., Candidaspp . Measurement of vaginal pH. Liquid cytology for evaluation of inflammatory changes and condition of vaginal epithelium.

Results: The study of microbiocenosis showed a high frequency of disorders among patients with the threat of premature birth.

Table 1 State of the microbiocenosis of the examined patients

Type of microbiocenosis	Number of patients (%)	Main microorganisms
Normal microflora	12 (20.7%)	Lactobacilli
Bacterial vaginosis	22 (37.9%)	Gardnerellavaginalis, Atopobiumvagas
Aerobic vaginitis	10 (17.2%)	Escherichiacoli, Enterococcusfaecalis
Candidiasis	8 (13.8%)	Candidaalbicans
Mixed dysbiosis	6 (10.3%)	Gardnerellavaginalis, Candidaspp

The highest frequency was observed in bacterial vaginosis (37.9%). Normal microflora was found in only 20.7% of patients. Aerobic vaginitis was detected in 17.2%, and candidiasis in 13.8% of women.

Table 2 Measurement of vaginal pH in different patient groups

Group of female patients	Average pH value
Normal microflora	4.0
Bacterial vaginosis	6.2
Aerobic vaginitis	5.8
Candidiasis	4.5
Mixed dysbiosis	5.9

In patients with bacterial vaginosis, vaginal pH reached 6.2, indicating severe disturbances in the microbiocenosis. Similarly, in aerobic vaginitis and mixed dysbiosis , the pH was higher than normal, creating favorable conditions for the growth of pathogens.

Liquid cytology. Cytological examination showed pronounced inflammatory changes in patients with microbiocenosis disorders.



Table 3. Results of liquid cytology in pregnant women with different types of microbiocenosis

Type of microbiocenosis	Inflammatory changes (%)	Epithelial dystrophy (%)	Presence of "key cells" (%)	Leukocytes in smear (units per field of view)
Normal microflora	0%	0%	0%	<10
Bacterial vaginosis	85%	50%	100%	> 25
Aerobic vaginitis	70%	40%	0%	> 30
Candidiasis	60%	20%	0%	15-20
Mixed dysbiosis	90%	60%	50%	> 30

Inflammatory changes in the vaginal epithelium were detected in 85% of patients with bacterial vaginosis and in 70% with aerobic vaginitis. "Key cells" characteristic of bacterial vaginosis was found in all patients with this diagnosis. In mixed dysbiosis, pronounced inflammatory processes and epithelial dystrophy were also observed.

Table 4. Degree of inflammation according to liquid cytology

Degree of inflammation	Normal microflora (%)	Bacterial vaginosis (%)	Aerobic vaginitis (%)	Candidiasis (%)
No inflammation	100%	0%	0%	40%
Mild inflammation	0%	15%	30%	40%
Moderate inflammation	0%	45%	50%	20%
Severe inflammation	0%	40%	20%	0%

The data in the table show that with bacterial vaginosis and mixed dysbiosis, inflammation was most pronounced, while with normal microflora it was absent. Moderate inflammatory changes were observed with aerobic vaginitis and candidiasis.

The results of the study show a high frequency of microbiocenosis disorders in pregnant women with the risk of premature birth. Bacterial vaginosis was the most common condition (37.9%), which confirms its leading role in the development of ascending infections that can lead to premature birth. High vaginal pH values in bacterial vaginosis and aerobic vaginitis confirm the presence of microbial imbalance.

Liquid cytology showed significant inflammatory changes in patients with bacterial vaginosis and mixed dysbiosis, which requires timely correction.

Thus, vaginal micropinocytosis disorders in pregnant women with the risk of premature birth are more common than previously thought. The main cause is bacterial vaginosis, which confirms the need for early diagnosis and comprehensive correction of these conditions. Early detection and treatment of vaginal infections can reduce the risk of premature birth and improve pregnancy outcomes. Successful diagnosis and treatment of vaginal dysbiosis can significantly reduce the risk of complications and premature birth, which helps maintain the health of the mother and fetus.



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