



ФАКТОРЫ, МОДУЛИРУЮЩИЕ СОСТАВ МИКРОБИОТЫ ВЛАГАЛИЩА

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✓ Резюме

Микробиота влагалища состоит из разнообразного набора лактобактерий и условно-патогенных микроорганизмов, обитающих во влагалищной среде. Вагинальная микрофлора большинства женщин в разные периоды жизни достаточно стабильна. Однако качественный и количественный состав микрофлоры влагалища может постоянно меняться в ответ на действия экзогенных и эндогенных факторов.

Анкетный опрос и изучение амбулаторных карт женщин репродуктивного возраста позволило нам установить, что неблагоприятный преморбидный фон, высокая частота воспалительных заболеваний органов малого таза, отягощенность акушерско-гинекологического анамнеза, бесконтрольное применение антибактериальных препаратов, длительное использование химических средств гигиены гениталий являются ведущими факторами, влияющими на развитие бактериального вагиноза у женщин нашего региона.

Ключевые слова: бактериальный вагиноз; нарушение микробиоты влагалища; факторы, влияющие на состав микробиоты влагалища.

ҚИН МИКРОБИОТАСИ ТАРКИБИНИ ЎЗГАРТИРУВЧИ ОМИЛЛАР

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✓ Резюме

Қин микробиотаси қин муҳитида яшайдиган лактобактериялар ва шартли патоген микрофлоранинг турли жамланмасидан иборат. Кўпчилик аёллар ҳаётининг турли давларида қин микрофлораси етарлича тургун бўлади. Аммо қин микрофлораси сифат ва сон таркиби жиҳатдан турли экзоген ва эндоген омиллар таъсирида доимий ўзгариб туриши мумкин.

Репродуктив ёшдаги аёлларда ўтказилган анкета сўровномаси ва амбулатор карталар таҳлили шуни кўрсатдики, салбий преморбид фон, кичик чаноқ аъзолари яллигланиши касалликлари учрашининг кўплиги, асоратланган акушерлик ва гинекологик анамнези, антибактериал препаратларни врач назоратисиз қўллаш, интим гигиена воситаларидан узоқ муддат давомида фойдаланиши бизнинг ҳудудимиз аёлларида бактериал вагиноз ривожланишига таъсир этувчи омиллар ҳисобланади.

Калит сўзлар: бактериал вагиноз; қин микробиотасининг бузилиши; қин микробиотасига таъсир этувчи омиллар.

FACTORS MODULATING THE COMPOSITION OF THE VAGINAL MICROBIOTA

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✓ Resume

The vaginal microbiota consists of a diverse set of lactobacilli and opportunistic microorganisms living in the vaginal environment. The vaginal microflora of most women in different periods of life is quite stable. However, the qualitative and quantitative composition of the vaginal microflora can constantly change in response to the actions of exogenous and endogenous factors.



A questionnaire survey and the study of outpatient charts of women of reproductive age allowed us to establish that an unfavorable premorbid background, a high incidence of inflammatory diseases of the pelvic organs, a burdened obstetric and gynecological history, uncontrolled use of antibacterial drugs, prolonged use of chemical hygiene products of the genitals are the leading factors affecting the development of bacterial vaginosis in women in our region.

Key words: bacterial vaginosis; violation of the vaginal microbiota; factors affecting the composition of the vaginal microbiota.

Relevance

Reproductive function is one of the main integral indicators of a woman's health, determines the quality of her life, and, accordingly, the health and quality of life of the nation.

The improvement of the demographic situation and the strengthening of reproductive potential depend on a number of factors: the health of adolescents, the somatic and reproductive health of women of fertile age, the course and outcomes of pregnancy, the level of reproductive losses. Currently, the problem of reproductive health protection has gone far beyond medical aspects and has acquired state significance.

It is known that the generative function of women largely depends on the presence and nature of inflammatory processes of a woman's reproductive tract. In recent years, there has been an increase in the frequency of vaginal infections occurring with the participation of microorganisms that are part of the normal vaginal microflora [3].

BV is one of the urgent health problems worldwide, as it causes serious complications related to women's reproductive health.

According to Lipova E.V. et al. (2012) in the population, with a full-fledged examination according to the Amsel criteria, this disease can be detected in every 4th woman [4]. When studying the composition of vaginal microbiocenosis by a more modern, molecular genetic method, BV was detected in 19.7% of clinically healthy women of reproductive age [2].

The vaginal microbiota consists of a diverse set of lactobacilli and opportunistic microorganisms living in the vaginal environment [5]. The vaginal microflora of most women in different periods of life is quite stable. However, the qualitative and quantitative composition of the vaginal microflora can constantly change in response to the actions of exogenous and endogenous factors. It is assumed that fluctuations in the composition of the microbiota in women of reproductive age contribute to the temporal dynamics of vaginal communities [8]. In fact, this fluctuation depends on hormonal changes, age, sexual practice and the use of antibacterial drugs [14]. Violation of the vaginal microbiota is accompanied by an excessive growth of opportunistic microorganisms, which ultimately contributes to the occurrence of bacterial vaginosis and the increase in other vaginal infections [3].

Violation of the vaginal microflora leads to the appearance of pathological unpleasant-smelling whites, which not only contribute to violations of sexual, generative functions, but also lead to the formation of persistent psychoemotional disorders, a decrease in the adaptive capabilities of the body and working capacity [6]. Insufficient knowledge of many aspects of this problem to date does not allow us to develop an effective system of forecasting, early diagnosis, prevention and treatment of this pathology. Such a state of the issue dictates the need for further research to expand the understanding of the mechanisms of bacterial vaginosis development in order to improve methods of its prevention and treatment.

The purpose of the study: to determine the factors contributing to the violation of the vaginal microbiota by studying clinical and anamnestic data.

Material and methods

We conducted a questionnaire survey and study of outpatient records of 150 women of reproductive age with an established diagnosis of bacterial vaginosis.

Results and their discussion

The analysis of the questionnaire data and the study of outpatient records showed that the majority of women with bacterial vaginosis were aged from 30 to 39 years (37.3%) compared with the groups of women aged under 20, from 20 to 29, from 40 and over (13.4%; 23.3%; 26.0%, respectively).

As can be seen, most of the patients with bacterial vaginosis were aged from 30 to 39 years. This is not only the most able-bodied and socially significant, but also sexually active reproductive age. Particular attention is drawn to the contingent of patients under the age of 20 who have not yet realized

their reproductive potential. In the anamnesis of patients of this age group – early onset of sexual life at 17-18 years.

A number of characteristic features were revealed when comparing the level of education. The percentage of women with specialized secondary and higher education was significantly lower.

When analyzing professional affiliation, we took into account the possible influence of working conditions and factors on the occurrence and development of bacterial vaginosis (Fig. 3.3). Among female employees there were 140 (21.1%), female students – 34 (5.1%), housewives – 177 (26.7%) workers - 313 (47.1%).

As can be seen from the presented data, workers prevailed among the patients. This group also includes women engaged in trade. This type of activity is associated with unsatisfactory conditions, frequent trips to earn money, which does not allow for timely examination and appropriate treatment.

Our analysis of the structure of complaints of BV patients showed that the most frequent complaints were about an increased amount of discharge from the genital tract and the "fishy" smell of vaginal discharge. Somewhat less often, patients noted discomfort in the genital area, itching or burning in the vaginal area, dysuria and dyspareunia.

Special attention should be paid to the fact that 47.3% of women had the listed complaints within 1-2 months before going to the clinic, 29.3% noted the prescription of complaints for more than 6 months, 14.7% noted relapses, despite repeated treatments, and 8.7% of women did not make any of the above complaints, although they had a pathological character discharge from the genital tract. The data obtained by us are consistent with the results of studies that show that up to 50% of cases of BV can be asymptomatic [3].

Analysis of the period of formation of menstrual function showed that 51.7% of women with BV had menarche at 13-14 years of age.

The analysis made it possible to establish that the majority of women with BV had a regular menstrual cycle, but 30.3% had a violation of it. Menstrual dysfunction in women with bacterial vaginosis indicates the undoubted importance of the influence of hormonal factors on the occurrence and development of this pathology.

Among the endogenous factors affecting changes in the vaginal microflora, the most frequent were hormonal changes (31.4%) associated with pregnancy (12.7%), abortion (7.3%), endocrine diseases (diabetes mellitus – 4.7%, euthyroid goiter - 6.7%). The most common extragenital pathology was anemia of varying severity (47.7%), chronic urinary tract infections (22.4%). Chronic diseases of the digestive system (11.9%), ENT organs (9.0%), cardiovascular system (6.0%) and respiratory organs (3%) were somewhat less common in the anamnesis. The majority of women (76.7%) noted a tendency to constipation.

The most frequent were inflammatory diseases of the female genital organs – 31.3% (chronic endometritis – 1.3%, chronic metroendometritis – 0.7%, chronic salpingoophoritis – 5.3%, ectopia (pseudoerosion) of the cervix – 7.3%, endocervicitis – 2.7%), colpitis - 14%. The high frequency of gynecological pathology of inflammatory genesis among women shows that a violation of the vaginal microbiota serves as a background for the development of subsequent inflammatory processes.

Surgical gynecological interventions were performed: diathermoelectrocoagulation of cervical ectopia (10.7%), hysterosalpingography (5.3%), diagnostic curettage of the uterine cavity (2.7%), termination of pregnancy by vacuum aspiration of the uterine cavity (12.7%), instrumental curettage (4.7%).

The prevalence of childbirth over abortion in the anamnesis was revealed in the majority of the women surveyed, while obstetric complications in the anamnesis (threatening miscarriage, non-developing pregnancy, premature discharge of amniotic fluid, premature birth, weakness of labor forces, postpartum purulent-septic diseases) occurred in 12.7% of women.

Among the exogenous factors affecting the change in the vaginal microflora, the following can be distinguished: therapy with antibiotics, antiviral, antifungal drugs – 28.7%; spermicidal contraceptives – 6%; hormonal contraceptives – 18.7%; intrauterine spirals – 61.3%; stress – 20.7%; violation of personal hygiene, as well as frequent douching – 25.3%; wearing tight non-hygroscopic underwear - 19.3%; anatomical deformities after childbirth – 8.0%.

Of particular importance in the reproductive period are shifts in the composition of vaginal microbiocenosis during the menstrual cycle. Thus, Song SD, et al. (2020) longitudinally characterized the vaginal microbiota of healthy young women and showed that the microbial diversity of the vagina increased and the number of *Lactobacillus* decreased during menstruation [14], which is consistent

with clinical observations of recurrent BV after menstruation [9]. In our study, we did not find a connection between BV and recent menstruation.

For the treatment of pathological secretions, women previously used antibiotics (18.7%), antifungal drugs (14.7%), anti-anaerobic drugs (10.7%), antiseptics (12%). 32% of the women surveyed indicated self-medication with antibacterial drugs. This shows that the antibacterial drugs used, along with the anti-inflammatory effect, suppress sensitive saprophytic microflora and disrupt antagonistic relationships within microbial communities inhabiting the vagina, resulting in favorable conditions for the development of infection.

In the survey, women reported using genital and vaginal hygiene products inside, including douching, rinsing, sprays, powders, moisturizers/lubricants, deodorizing suppositories, tablet suppositories (for example, probiotics, pills for vaginal infections) and waxing pubic hair. The products were more often used externally than internally, with the exception of some products, such as suppositories and douches, intended for internal use. In women (57.3%) who reported frequent use of douching, moisturizing/lubricants, deodorizing suppositories, an association of these practices with frequent recurrence of vaginal infections in the anamnesis was revealed. The frequency of use of various products varied significantly, with a significant proportion of participants (64.0%) using the product in or around the vagina at least once a day during the last 2-3 months.

Despite the fact that only a few risk factors have been identified for BV, the study of women's sexual behavior can largely take place in the epidemiology of BV.

When interviewing women, we clarified the age at the first sexual contact and found that more than 80% of women were aged 18 or more when entering into their first sexual relationship. Most of the women we interviewed were married and did not have more than one sexual partner, which is why we could not determine the relationship of this risk factor with the recurrence of BV. However, we found that only a small part of the women surveyed (3.0%) used condoms regularly during sexual contact, which indicates in favor of protecting this method of contraception from recurrent BV.

Recently, the microbiota of the genitals of couples has been actively discussed [7, 15] and the recognition that BVAB can be transmitted sexually between partners [12]. The results of studies of the microbiota of the penis have shown the effect of male circumcision on reducing the risk of STI/HIV infection and bacterial vaginosis in sexual partners [15]. In addition, it is believed that persistent or recurrent BV in women may be primarily caused by heterosexual contact with bacteria associated with BV [7].

Similar urogenital microflora has been identified between partner pairs and several studies have confirmed heterosexual transmission and concordance of BV-associated bacteria. In the work of Jespers V. et al (2014), a link was traced between BV and the presence of a prostate-specific antigen in the vaginal fluid, which indicates a recent unprotected sexual intercourse [10]. In more recent studies, it has also been confirmed that sexual intercourse without a condom increases the number of bacteria associated with BV (in particular, *Atopobium vaginae* and *Prevotella*) in the vagina and leads to vaginal dysbiosis [1, 7].

BV is much more often detected in women who have had more than one sexual partner in the last 6 months than in women who have not had a single partner or who have had one partner [11]. These results suggest that sexual behavior, as well as sexual intercourse and the microbiota of the penis has a significant impact on the microbiota of the vagina.

A characteristic feature of BV is the absence of signs of an inflammatory response of the mucous membrane, and therefore many of these women had no symptoms of the disease.

Conclusion

Unfavorable premorbid background, high incidence of inflammatory diseases of the pelvic organs, burdened obstetric and gynecological history, uncontrolled use of antibacterial drugs, prolonged use of chemical hygiene products of the genitals are the leading factors influencing the occurrence and development of bacterial vaginosis.

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