

Clinical and cytological uterine cervix tissue alterations associated with opportunistic pathogenic infections of sexually transmitted diseases

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SUMMARY: Clinical and cytological uterine cervix tissue alterations associated with opportunistic pathogenic infections of sexually transmitted diseases.

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The rationale for this study is in the lack of precise data on the role of urogenital opportunistic pathogenic infection in uterine cervix pathologies development. The purpose of the work is to make a clinical laboratory evaluation of the role of urogenital opportunistic pathogenic flora in etiology and pathogenesis of pathological uterine cervix conditions and to identify possible preventive measures to uterine cervix development. The main method used was clinical laboratory study of uterine cervix cells and tissue condition in 151 patients before and after the treatment, which allowed the Authors to prove the role of urogeni-

tal opportunistic pathogenic infection in uterine cervix pathologies development and cells homeostasis disorders. Before the treatment, different uterine cervix pathologies were not identified only in 17.2% of the patients, normal cytogram was observed in 12.6% of patients. After the treatment, uterine cervix pathologies were not identified in 72.9% of patients, normal cytogram was observed in 54.3% of patients, i.e. the number of cured patients increased by more than 4 times. Thus, the role of urogenital opportunistic pathogenic infection in uterine cervix disease development and cells homeostasis disorders was proved. The results of the present study confirmed the role of the urogenital opportunistic pathogenic infection in uterine cervix cells and tissues condition and cells homeostasis disorders, which identified primary preventive measure of cervix neoplasms development. The materials of the present study can be useful for dermatovenerologists and obstetricians that are involved in treatment of patients from the mentioned above category.

KEY WORDS: Sexually transmitted infections - Uterine cervix tissue alterations - Cells homeostasis disorders - Prevention of uterine cervix cancer.

Introduction

Sexually transmitted infections (STIs) play an important role not only in medical, but also in social and psychological aspects in modern society. Nowadays, urogenital infections are characterized by silent or obliterated development, but this does not make them less dangerous and can provoke severe complications. Cervix pathologic conditions occupy one of the leading places in the range of gynecological diseases. Among benign cervix diseases, inflammation processes are most widespread (92.2%), 73.2% of them are endocervicitis, in 30% of

cases endocervicitis is associated with ectopia. Long-term cervix and cervical canal inflammation is caused by microorganisms penetration into intercellular space of the mucous membrane crypts, sometimes it is associated with metaplasia development (1-4).

STIs increase the risk of uterine cervix cancer development, which is considered to be the second leading cause of oncologic patients mortality (5, 6).

It is known that background processes, that lead to dysplastic alterations in cervix, in the majority of cases depend on the presence of the sexually transmitted infectious agents, which can cause uncontrolled tissue proliferation. This is especially important because the majority of specialists during patients examination focus only on diagnostics of classic sexually transmitted diseases. Meanwhile, the most widespread diseases are mycoplasmosis, ureaplasmosis and chlamydiosis.

Morphologically multilayer squamous epithelium of the vaginal part of the cervix goes through the stages of differently expressed epithelial dysplasia during the process of malignization. Epithelial dysplasia develop-

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ment, in its turn, is associated with such underlining disorders as ectopia, leukoplakia and inflammatory diseases of the cervix. The term “underlining disorders” combines different etiological and morphological conditions that are not premalignant, but that can contribute to the development of dysplasia and cervix cancer (7, 8).

Cervical cancer remains one of the most widespread malignant tumors in women. It is the second leading cause of lethality in women with malignant neoplasms in the world. The ratio of mortality to morbidity rate is 55%. During the past decade, the following unfavorable tendencies were observed. Firstly, the rate of cervical cancer morbidity is increasing in general and, in particular, in patients of reproductive age. Secondly, the rate of advanced cervical cancer forms is also increasing. In Russia cervical cancer occupies the 5th place in the range of malignant neoplasms in women and the 2nd place (after endometrial cancer) in the range of genital malignant neoplasms.

In 38.9% of patients this disease is diagnosed at the 3rd or 4th stage, when the efficiency of the modern methods of treatment significantly decreases. In Russia during the past 10 years, absolute number of patients with cervical cancer increased. A lot of researchers highlights the tendency towards cervix cancer morbidity rate increase among young women. Annual increase is estimated as 2.1% (9, 10).

According to the recent research data, every 7th woman with cervix cancer had chronic inflammation in the medical history. The survival rate of patients with 1st and 2nd stage of cervix cancer is around 95%. Hence, timely and qualitative diagnostics and adequate treatment of cervix inflammations can be considered as primary cervix cancer preventive measures (11-13).

At present, researchers pay special attention to STIs, in particular, to mycoplasmal infections of background etiology, that contribute to the development of cervix cancer, and to genitourinary system disorders, in particular, inflammatory diseases of cervix and cervical canal.

The problem of association between mycoplasmal infection and urogenital tract pathologies is discussed in many publications. Still, there is no final and definite solution. The studies are complicated, on the hand, by the high rate of mycoplasma infections among clinically healthy women of different age, and on the other hand, by the high rate of their diagnostics during many pathological processes in obstetrics, gynecology, urology, venerology and oncology. Besides, the accumulated research data on different populations and groups, obtained by different methods, also influences the ambivalent evaluation of the identified facts (7).

Thus, the purpose of the present study was to make further evaluation the influence of urogenital opportunistic pathogenic infections on the development of pathological conditions in uterine cervix.

Material and methods

Clinical scientific research study was conducted at the Department of Dermatovenerology at the Kazan State Medical University in partnership with the chain of federal independent laboratories “Citylab”.

The researchers based on common principles of STIs and urogenital infections treatment, that are defined by Federal clinical guidelines of the Russian society of dermatovenerologists and cosmetologists “Dermatovenerology” (Moscow, 2016). The guidelines included the following sections: anamnestic data, indications for STIs tests, clinical material, procedures of clinical material sampling for laboratory tests, patients consulting and therapy (14).

To identify STIs pathogens, the Authors used bacterioscopic, bacteriologic and molecular biologic methods. Quantitative assessment of the number of STIs pathogens was not conducted, because according to Federal clinical guidelines the need in quantitative assessment, as well as clinical evaluation of the obtained results, is not proved. During patients clinical management, the Authors used digital fiber optic videocolposcope “SVL - 110” with further obtained data analysis.

The study entry criteria were the following:

- 1) Women of reproductive age (20-35 years old)
- 2) Confirmed etiologic diagnosis of opportunistic pathogenic urogenital pathogens
 - A.63.8(+72) - cervicitis, caused by *Ureaplasma spp* and /or *Mycoplasma hominis*
 - N.89.0 - bacterial vaginosis
 - B.37 - urogenital candidosis
- 3) Patient informed consent for enrolment into the study.

For bacterioscopic study the cervical canal discharge was spread by a sterile cotton pellet on an object-plate in thin layer. It was fixed at room temperature with further Gram staining and studied under microscope at x630 magnification. For molecular biological studies the researchers used urogenital sounds and transport media, strictly following all the requirements to probe sampling, storage and transportation of the patients biological material. Cytological study was used for evaluation of morphological status of cells elements in cytological material and pathological alterations in the cells structures.

Biological material sampling for cytological study was performed by special T-shaped brush for the scope of cervix and cervical canal tissues during colposcopy and vaginal examination. The following rules had to be followed for biomaterial sampling:

- sexual abstinence for minimum 48-60 hours before the sampling
- intravaginal drugs avoidance
- vaginal douch avoidance

- biomaterial sampling in periovulation intermenstrual period
- absence of any discharge from genital tracts.

Uterus cervix and cervical canal cells condition was evaluated by five parameters:

1. Absence of pathologic cells
2. Absence of altered cells, cell nucleus is slightly transformed and enlarged
3. Insignificant alterations in cell nucleus and cytoplasm, risk of cells malignant transformation
4. Insignificant amount of abnormal cells, signs of malignant process
5. Numerous abnormal cells, precancerous state.

The method of cervix tissue liquid-based cytology was used, which is the primary method of cervix and cervical canal pathologies identification.

After the sampling, the biomaterial was placed into special liquid transport media. Cells washing (cytopreparations) was performed by centrifuging into an uniform layer. The obtained material was mixed with special stabilizing solution, which mechanically separated epithelial cells from different impurities and allowed the researchers to prepare a standardized multilayer smear and to improve the quality of cytological study.

Biomaterial was sampled by a special cytobrush of certain form, which was placed into the sterile stabilizing solution together with the biomaterial. All the cells maintained their form and structure, which guaranteed qualitative and maximally reliable test result.

Automatic processor performed all the operations on preparation of cytological material by means of special program. Uniform distribution of cytological preparation on a special slide glass significantly increased the quality of laboratory tests.

The treatment was indicated by the presence of clinical laboratory signs of reproductive system inflammatory and infectious disease.

Therapy regimen: doxycycline monohydrate 100 mg per os BID (12-hour interval between the doses) right

after the meal for 10 days or josamycin 500 mg per os TID (8-hour interval between the doses) for 10 days.

Local sanitation of cervix and cervical canal was performed according to the respective requirements and indications.

The treatment of inflammatory alteration of the cervix surface tissue was conducted by officinal solution of solcovagin, which is characterized by diverse action on different cervix epithelium tissues. Ectopic cylindrical epithelium and subepithelial stroma devitate, and squamous epithelium cells resist the solution action. The diseased tissues were treated with the solution by a cotton pellet from 1 to 3 times with 4-6 days intervals.

Epithelizing drugs were applied locally: gel solcoseryl or methyluracil ointment BID for 5-9 days, which enhanced tissue regeneration.

Physiotherapeutic methods included darsonvalization locally per vaginum for 8-10 days, application time was 15-20 minutes per day to stimulate tissues and mucous membranes by alternate impulses of high voltage sinusoidal current (20-40 kW) at current frequency from 100 to 140 kHz and low amperage up to 0.2A. The stimulation was performed through special glass headers - electrodes.

Test of cure was performed based on microscopic and molecular biological tests of clinical material sampled from vagina and cervical canal not sooner than 30 days after the treatment, with obligatory digital optical fiber videocolposcopy.

Results

During the study 328 patients of reproductive age from 20 to 35 years old ($M \pm m = 27.2 \pm 0.6$) were examined. All of them applied for specialized medical care. 151 (46.0%) of them had sexually transmitted opportunistic pathogenic infections identified (Table 1).

Mixed infections were identified in most cases: in 62

TABELLA 1 - MICROBIOLOGICAL COMPOSITION OF SEXUALLY TRANSMITTED OPPORTUNISTIC PATHOGENIC MICROFLORA IN THE EXAMINED PATIENTS.

STIs	Patient group			
	Before treatment		After treatment	
	abs.	%	abs.	%
<i>Mycoplasma hominis</i>	29	19.2		
<i>Unaplasma Unalyticum</i>	21	13.9		
<i>Unaplasma pazvum</i>	19	12.6		
<i>Gardnerella Vaginalis</i>	12	7.9	1	
<i>Candida SPP</i>	8	5.3	1	
Mixed infection	62	41.1	2	1.3
Total	151	100	151	100

TABELLA 2 - RESULTS OF BIOSAMPLES BACTERIOLOGICAL TESTS IN PATIENTS WITH UROGENITAL OPPORTUNISTIC PATHOGENIC INFECTION FOR DISCHARGE PURITY BEFORE AND AFTER THE TREATMENT.

Discharge purity	Patient groups			
	Before treatment		After treatment	
	abs.	%	abs.	%
I degree	23	15.2	64	42.4
II degree	25	16.6	51	33.8
III degree	61	40.4	20	13.2
IV degree	42	27.8	16	10.6
Total	151	100	151	100

out of 151 patients (41.1%). Among mono-infections, the leading was *Mycoplasma hominis* – 29 cases (19.2%), then *Ureaplasma Urealyticum* – 21 cases (13.9%), *Ureaplasma parvum* – 19 cases (12.6%), *Gardnerella vaginalis* – 12 cases (7.9%), *Candida spp.* – 8 (5.3%).

134 patients (88.7%) did not have subjective complaints. Complaints on minor discharge from reproductive tract were in 9 patients (6.0%), menstrual period disorders were in 3 patients (2.0%), periodical discomfort at the bottom of the abdomen was in 3 patients (2.0%), lack of libido and dyspareunia was in 1 patient each.

After complex treatment only in 2 cases (1.3%) mixed infection was identified, and *Candida spp.* and *Gardnerella vaginalis* was in 1 case each.

Biobacteriologic tests of biosamples obtained from vagina and uterus cervix showed the following results (Table 2).

I degree of purity, that defined acidic reaction, containing only Doderlein bacillus and squamous epithelial cells, was identified before the treatment only in 23 patients (15.2%) and after the treatment in 64 patients (42.4%).

II degree of purity, that also defined acidic reaction, containing cocci, epithelial cells, not more than 5 leucocytes in the vision field, was identified before the treatment in 16.6% of cases and after the treatment in 33.8% of cases.

III degree of purity, that defined neutral medium, containing Doderlein bacillus, a great number of diverse flora and up to 15 leucocytes in the vision field, was identified in 40.0% of cases and after the treatment only in 13.2%.

IV degree of purity, that defined base reaction, absence of Doderlein bacillus in the smear, all vision field was covered with leukocytes, cell clusters of squamous epithelium and cocci flora, was identified before the treatment in 27.8% and after the treatment in 10.6%.

The analysis of vaginal discharge purity showed that in patients with sexually transmitted opportunistic pathogenic infections III degree of purity was identified in most cases.

All the patients had digital optical fiber videocolposcopy done, that showed the following results (Table 3).

Cervicitis was diagnosed in most cases: before the treatment it was identified in 24 patients (16.0%). Endocervicitis was identified in 22 patients (14.6%), retention cysts (cervical glands with outer pore covered with thick layer of squamous epithelium resulted from metaplasia, that leads to secret accumulation, gland expansion and perifocal inflammation development) – in 9 patients (6.0%), open cervical glands without signs of cornification that present physiological norm – in 7 patients (4.6%), true cervical erosion – in 4 (2.6%) and cervix pointed condyloma – in 5 (3.3%). After the complex treatment these pathologies were not identified.

It should be noted that ectopia (cervix pseudo erosion) was third in the range of endoscopic findings, it was identified in 15 cases (10.9%). After the treatment its rate decreased to 8.9%. Transformation zone (replacement of cylindrical epithelium cells with squamous epithelium cells) before the treatment was identified in 13 patients (8.6%), after the treatment – in 7.3%. The number of patients with endometriosis (4.0%) (thin epithelial layer with leukoplakia caused by cornification and thickening of epithelial bed, characterized as precancerous state (1 case)) after the treatment did not decrease, unfortunately. Areas of aceto-white epithelium, that is considered to be the most important colposcopic sign, common to all the stages of cervical intraepithelial neoplasia (CIN) that can indicate on neoplastic process development at early stages, before the treatment was identified in 3 cases (2.0%), after the treatment – in 1.3% of cases.

Atypical vessels, that appear during adaptive proliferation and indicate on malignization process, were identified in 1 case. This category of patients was directed to obstetrical gynecologists for further treatment.

It should be noted that only in 26 cases (17.2%) cervix pathologies were not identified colposcopically before the treatment. After the treatment cervix pathologies were not identified in 110 cases (72.9%).

Tests results for alterations in biosamples of endocervix

TABELLA 3 - RESULTS OF ENDOSCOPIC EXAMINATION OF UTERINE CERVIX AND CERVICAL CANAL IN PATIENTS WITH SEXUALLY TRANSMITTED OPPORTUNISTIC PATHOGENIC INFECTIONS.

Endoscopic findings	Patient groups			
	Before treatment		After treatment	
	abs.	%	abs.	%
Not found	26	17.2	110	72.9
Cervicitis	24	16.0	-	-
Endocervicitis	22	14.6	-	-
Ectopia	15	10.0	13	8.6
Transformation zone	13	8.6	11	7.3
Retention cysts	9	6.0	-	-
Open cervix glands	7	4.6	-	-
Endometriosis	6	4.0	6	4.0
Pointed condyloma	5	3.3	-	-
True erosion	4	2.6	-	-
Aceto-white epithelium	3	2.0	2	2.0
Iodine-negative zone	2	1.3	1	-
Atypical vessels	1	-	1	-
Leukoplakia	1	-	1	1
Associated pathology	13	8.5	8	5.2
Total	151	100	151	100

cells composition before the treatment and after the treatment are presented in Table 4. The quality of the obtained material in all the cases was adequate, which allowed the Authors to make an objective comparison of endocervix tissues cells composition. Cytogram was normal before the treatment only in 19 cases (12.6%), after the treatment it increased to 54.3%, i.e. by more than 4 times, which indicated on significant improvement of the infected tissues cells composition.

The number of patients with the amount of cervical mucus as “significant” after the treatment reduced from 80 cases to 17 (39.6%), which indicated on reduction of tissue irritation factor action. The number of patients with “moderate” amount of cervical mucus, which was physiological norm, increased by 38.3%.

It should be noted that the number of patients with erythrocytes presence in biosamples also decreased from 42 to 2 cases (32.4%), which indirectly indicated on inflammatory reactions in tissues.

Inflammation rate reduction, associated with decrease of leucocytes in biosamples, was identified in 56 patients out of 97 (by 37.2%).

The dynamics analysis of exocervical cells composition showed the following results (Table 5).

The quality of the studied material in all the cases was adequate, the cytogram was normal before the treatment in 23 cases, after the treatment – in 87 cases (increased by 42.4%).

After the treatment the number of patients with erythrocytes in biomaterial decreased by 23.2%. The number of patients with “moderately expressed” inflammatory component in biosamples after the treatment reduced by 47.1%, the number of patients without inflammatory component reduced by 35.4%, and there were no patients with “expressed” inflammatory component. The number of patients with metaplastic cells in smears reduced by 25.9%. It is important to mention that after the treatment, the number of patients with altered cells of squamose epithelium and mild dysplasia reduced by 8.0%. The number of patients with atypical squamous cells of underterminal significance (ASCUS), inflammatory-reparative response, decreased by 17.2%.

During the study the researchers performed the tests of smears, obtained from patient uterine cervix and cervical canal, according to the method of Papanicolau (PAP-test), because this test plays an important role in the diagnostics of different background processes on the cervix and cervical cancer (Table 6).

It should be noted that after the treatment, the number of patients with “class II” cytogram, that was characterized by epithelial cells with insignificant morphologic alterations caused by inflammatory process, reduced by 57.0%. The number of patients with “class III” cytogram, that was characterized by cells with significant morphological alterations defined as dyskaryosis, reduced by 7.3%. After the treatment the number of patients

TABELLA 4 - DYNAMICS OF CELLS COMPOSITION IN BIO-SAMPLES FROM ENDOCERVIX OF THE EXAMINED PATIENTS.

Parameter	Group (n = 151)			
	Before treatment		After treatment	
	abs.	%	abs.	%
Quality of the preparation				
adequate	151	100	151	100
not enough adequate	-	-	-	-
inadequate	-	-	-	-
Normal cytogram	19	12.6	82	54.3
Amount of endocervical mucus				
poor	22	14.6	24	15.9
medium	49	34.5	110	72.8
significant	80	50.9	17	11.3
Squamous epithelium				
surface layer	18	12.0	9	6.0
intermediate layer	6	4.0	4	2.6
Presence of cylindrical epithelium structure				
small, stripes shaped	42	27.8	39	25.8
significant	109	72.2	112	74.2
Presence of erythrocytes	47	31.1	2	1.3
Presence of leucocytes in vision field				
up to 10	30	19.9	92	61
10-20	44	29.1	38	25.2
20-30	53	35.1	18	11.8
>30	24	15.9	3	2.0
Flora				
cocci	69	45.7	9	6.0
rod bacteria	61	40.4	110	72.8
mixed	21	13.9	32	21.2
Cytogram				
Presence of atypical cells of unknown origin	24	15.9	3	2.0
with age related alterations	2	1.3	2	1.3
atrophic type	14	9.3	14	9.3
estrogenic type	10	6.6	9	6.0
inflammatory type	82	54.3	2	1.3

TABELLA 5 - DYNAMICS OF ENDOCERVIX CELLS COMPOSITION IN THE EXAMINED PATIENTS.

Parameter	Group (n = 151)			
	Before treatment		After treatment	
	abs.	%	abs.	%
Quality of the preparation				
adequate	151	100	151	100
not enough adequate	-	-	-	-
inadequate	-	-	-	-
Normal cytogram	23	15.2	87	57.6
Presence of erythrocytes	37	24.5	2	1.3
Inflammatory component				
not expressed	67	44.7	121	80.1
mildly expressed	78	51.7	7	4.6
expressed	6	3.6	-	-
Squamous epithelium				
surface layer	128	84.8	128	84.8
intermediate layer	108	71.5	122	81.0
Presence of metaplastic cells				
typical nuclei	62	41.1	23	15.2
atypical nuclei	46	30.5	20	13.2
uniform chromantin	16	10.6	3	2.0
non-uniform chromantin	44	29.1	18	12.0
cytoplasm	18	12.0	5	3.2
consistent	34	22.5	12	12.6
inconsistent	28	18.6	4	2.6
homogenous	12	8.0	48	31.8
non-homogenous	14	9.3	11	7.2
Squamous epithelium alterations				
mild dysplasia	14	9.3	2	1.3
moderate dysplasia	-	-	-	-
expressed dysplasia	-	-	-	-
ASCUS (atypical squamous cells of underterminal significance – inflammatory-reparative response)	32	21.2	6	4.0

with “class I” cytogram, that was characterized by “cytological picture is normal”, increased by 65.0%.

Discussion

The studies of E.V. Faizullina et al. showed that nowadays, urogenital infections are characterized by silent or obliterated development, but this does not make them less dangerous and can provoke severe complications in human reproductive system (15).

According to Petrova A.S. et al., despite of modern methods of diagnostics and application of wide range of antibacterial drugs, the rate of inflammation diseases in reproductive system is still high. Chronic inflammatory diseases tend to develop with low or no symptomatic activity and to change ethnological structure of pathogens

towards domination of opportunistic pathogenic microflora (16).

Sukhikh R.T. and Shurshalina A.V. highlight in their works that the difficulty of such patients management is associated with the prevalence of specific subclinical forms of the diseases, lack of specific clinical symptoms, wave-like progression and increasing of inflammation due to a cascade of secondary damage, formation of self-maintained pathological system with intensive sclerotic processes, damage of cells matrix, intercellular disorders and alteration of tissue architectonics, which require a complex of targeted therapeutic measures (17).

The analysis of the studies conducted by Gantsev S.Kh. shows that uterine cervix cancer occupies the 3rd place in the range of widespread diseases among malignant neoplasms of reproductive system (breast cancer and endometrial cancer are the 1st and 2nd) and the 1st place

TABELLA 6 - DYNAMICS OF BIOSAMPLES CYTOLOGICAL TESTS FROM ENDO AND EXOCERVIX BY INTERNATIONAL CLASSIFICATION (PAP-TEST).

Class	Parameter	Group (n = 151)			
		Before treatment		After treatment	
		abs.	%	abs.	%
	Sample adequateness satisfactory	151	100	151	100
I	Normal cytological picture	34	22,5	132	87,4
II	Epithelial cells with insignificant morphological alterations, slight nucleus enlargement and appearance of metaplastic epithelium cells	92	61,0	6	4,0
III	Cells with more significant morphological nucleus alterations, defined as dyskaryosis	24	15,9	13	8,6
IV	Atypical cells that could be malignant	1	-	-	-
V	Cancer positive cells	-	-	-	-

among the causes of oncologic women mortality. The problem is especially acute because of sharp increase of uterine cervix cancer rate among women of reproductive age (9, 18, 19). Some researchers believe that the main cause of appearance and development of inflammatory reactions in cervix tissues are STIs. Presently, researchers attention is focused on sexually transmitted opportunistic pathogenic infections, especially those that localize intracellularly. Nowadays, urogenital infections are characterized by silent development, but this does not make them less dangerous and can provoke not only severe organ complications, but also different alterations on tissue and cell levels (20-22).

Bruman R.C. and McClarty G. in their studies prove that epithelial tissue pathological process, developed because of inflammation reaction caused by STIs, depends on local and general protective and compensatory reactions of the microorganisms. As a rule, edema and hyperemia of mucous membranes develops in the area of infection penetration. Also, the integrity of epithelial layer with partial desquamation is damaged and other alterations in epithelial cells, lymphoid subepithelial and deeper infiltration and different homeostasis disorders occur (14).

Thus, the analysis of a number of studies on the subject showed that the present study focused on the issues of urogenital opportunistic pathogenic infections

influence on cytological homeostasis in cervix tissues, that were not studied earlier.

Conclusion

1. Implementation of new laboratory technologies, modern equipment and instrumental methods of patient management with inflammatory pathology of uterine cervix allows the clinicians to improve significantly the diagnostics of this pathology, to perform prognostic modelling of intercellular associations and to evaluate the sufficiency of the indicated therapy.
2. Timely and competent complex of ethiopathogenetic therapy of inflammatory diseases of uterine cervix contributes to the restoration of the damaged tissues and cells homeostasis, which is the primary preventive measure of cervix neoplasm development.

Recommendations

The materials of the present article can be useful to dermatovenerologists and obstetrician gynecologists in their practice in the prevention of background conditions at uterine cervix development.

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