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### The authors

1. Nataliya Sidorova, Assistant of the Department of Phthisiology, Clinical Immunology and Medical Genetics of the State establishment of Lugansk people's republic Saint Luka state medical university, e-mail: 75natallyasidorova@gmail.com, Lugansk, Street Ostraya Mogila, 156/18;

2. Sotskaya Yana, Doctor of Medical Sciences, Professor, Head of the Department of Infectious Diseases and Epidemiology named after V. M. Frolov of the State establishment of Lugansk people's republic Saint Luka state medical university, e-mail: [Sotckaya@mail.ru](mailto:Sotckaya@mail.ru), Lugansk, Quarter Jugnii, 6.

M.P. Kirillina, A.K. Ivanova, E. L. Lushnikova

## CYTOLOGICAL ANALYSIS OF CERVIX INFLAMMATORY DISEASES IN DIFFERENT AGE GROUPS ON THE EXAMPLE OF THE SAKHA (YAKUTIA) REPUBLIC

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### ABSTRACT

Cytological analysis of cervix inflammatory diseases was conducted on women aged 18 to 88. The results of the analysis showed a high incidence of disease in the age groups 18-29. In the middle age group (30-44 and 45-59 years), balancing of genital infections is noted and the first effects of infection with viral infections appear (dysplasias of varying severity and background changes in the epithelium). In women in the older age group, mainly inflammatory processes (atrophic colpitis) were observed, which is associated with the intense influence of sex hormones. Generally, long-term preservation of viral HPV is associated with high-oncogenic risk types of HPV infection (mainly HPV 16). Remote causes of viral infection were found rarely (2.9%) on menopause, but it has the important prognostic value, which can predict the risk of cervical pathology development. Inflammation processes (senile vaginitis) are found in the old age group of women (20.9%), which is due to the intensive influence of sex hormones (estrogens). At this period the lack of estrogen harms the main protective properties of the stratified squamous epithelium. As a result, the number of lactobacilli is decreased or completely disappeared by the cause of conditionally pathogenic and pathogenic flora overgrowth.

Thus, infectious-inflammatory diseases of the female genital organs caused by various pathogens, sexually transmitted diseases, or nonspecific microflora, represent a serious medical and social problem.

**Keywords:** oncocytopology, diagnostics, inflammation.

**Relevance.** Pelvic inflammatory diseases (PID) establish itself as a leading position in the structure of gynecological disorders, also become the most common cause of women's reproductive system disability. Thereby, it creates a major health, social and economic problems worldwide [2, 7, 10, 11, 13, 15].

The starting moment for the progression of acute inflammatory diseases is the invasion of microorganisms. Cervix is an important protective barrier on the way for plaque formation in the internal genital organs. Almost all microorganisms those present in the vagina, except for lactobacillus and bifidobacteria, can be involved in the development of the inflammatory process [4]. However, in most cases, PID is caused by sexually

transmitted infections [8, 12]. The immune system takes an important part in the pathogenesis of female genital organs inflammation. Inflammation and immune process are inextricably linked, and currently, inflammatory and immune responses are considered as a complete whole [9]. Notice that at the beginning of the pathological process only one infectious agent activates the inflammatory response, changes local immune system functioning. Thereby it prepares the breeding ground for further contamination with opportunistic pathogens [8, 14].

There are different factors in cervix inflammatory process: bacterial imbalance; thinning of stratified squamous epithelium in postmenopausal years along with the inflammatory process

(senile vaginitis); various physical and chemical effects; earlier diseases that harm the immunity system; infections [1].

Modern PID is a problem of sexually active women. Recently most researchers find out that social factors take the main part in the genesis of the PID progression, such as early sexual debut, high sex frequency, high number of sexual partners, sexual activity during menstruation, using of drugs [6, 16]. Many scientists consider that genital inflammatory process is the onset of majority gynecological diseases. According to V. N. Serov et al, chronic inflammatory process in the genital organs responsible for the formation of such pathology as endometriosis, uterine fibroid, hyperplastic processes, infertility of various origins, neoplastic diseases

of the cervix, as well as functional disorders that violate the normal course of pregnancy [5].

Chlamydia and trichomonas viruses have the most severe course and complications for women's health.

The importance of inflammatory infection of the female genital system primarily determined by the fact that this disease affects organs and tissues of reproductive function. The Imbalance of bacteria in the vagina can be asymptomatic in almost half of affected women. Usually, it has no any signs of disease, and remains without medical treatment [9].

The aim of the study: to determine the incidence of cervix inflammatory diseases among women of different age groups.

**Materials and methods.** Cytological material of cervix has been analyzed in M.K. Ammosov NEFU Medical clinic laboratory of pathomorphology, histology, and cytology. Material was taken from 7600 women aged 18 to 88, who appealed to various medical centers of the Sakha (Yakutia) Republic for prophylactic and diagnostic purposes during 2017.

Material for the cytological study was smears taken from the cervical mucosa and cervical canal. Eliseev (2007) age classification was applied to identify trends of the epidemic process in different age groups. According to it, persons from 18-29 are young age, from 30-44 are mature age, from 45-59 are middle age, from 60-74 are old age [3].

The diagnosis was conducted by Romanovsky-Gimza staining method. Cytological diagnosis was determined according to the clinical and morphological classification of Bohman (1976).

**Results and discussion.** The age composition of the studied was as follows: from 18 - 29 years - 2645 women (34,8%), 30-44 years - 2315 women (30,4%), 45-59 years - 1840 women (24,2%) and 60 years and over - 800 women (10.5 %).

Results of the cytological examination (table 1) diagnosed cervix inflammatory disease in 4629 cases; it is about 61% of the total investigated women. In the different age groups we registered the highest rate in the 18-29 years - 1696 cases (36.6%), and 30-44 years - 1407 cases (30,4%). In women aged 45-59 years 1065 PID cases were noted (23%).

In most cases 1815 (39.2%) studied women had flora dysbiosis (bacterial vaginosis (BV) and Lactobacillus).

**Note: in the numerator - indicators before the start of treatment, in the denominator - after its completion; the probability of a difference in the indicators relative to the norm: \* - for  $P < 0,05$ , \*\* -  $P < 0,01$ , \*\*\* -  $P < 0,001$ .**

	Age				
	18-29	30-44	45-59	60 years and older	Total
Inflammatory process	540 (29.8%)	348 (19.2%)	542 (29.9%)	379 (20.9%)	1809 (39%)
Flora dysbiosis	740 (40.7%)	693 (38.2%)	337 (18.5%)	45 (2.5%)	1815 (39.2%)
Candidal colpitis	57 (49.5%)	38 (33%)	17 (14.8%)	3 (2.6%)	115 (2.5%)
Trichomonas colpitis	29 (49.1%)	16 (27.1%)	13 (22%)	1 (1.7%)	59 (1.3%)
Follicular cervicitis	47 (49.5%)	25 (26.3%)	13 (13.7%)	10 (10.5%)	95 (2%)
Remote causes of chlamydia	14 (29.7%)	18 (38.3%)	12 (25.5%)	3 (6.4%)	47 (1%)
Remote causes of viral infection	269 (39%)	269 (39%)	131 (19%)	20 (2.9%)	689 (14.9%)
Total	1696 (36.6%)	1407 (30.4%)	1065 (23%)	461 (9.9%)	4629 (61%)

Cytogram of the inflammatory process marked by the presence of so-called mixed bacterial flora, leukocytosis and reactive changes of the epithelium.

Maximum incidence observed in the age group of 18-29 years - 740 cases (40.7 %) and 30-44 years 693 cases (38.2 %). Next by incidence of occurrence was inflammatory processes in 1809 cases (39%). The highest incidence was recorded in the age groups of 45-59 years - 542 cases (29.9%) and 18-29 - 540 cases (29.8%).

Currently, the greatest interest among sexually transmitted infections represents the human papillomavirus (HPV). The main cytological feature is the presence of the so-called koilocytes, cells of layered epithelium with an extensive perinuclear region of enlightenment of cytoplasm, and with a characteristic arrangement of nuclei («kissing») in smears (fig.2).

The study of remote causes of viral infection were determined in 689 cases, which composed 14.9% of the total number of inflammatory diseases. In general, the maximum incidence of this pathology registered on women of active reproductive age from 18 to 44 years, 269 cases (39%) (fig.3). These women are recommended to test HPV. The highest response has a method of polymerase chain reaction (PCR), unfortunately, there is no data on post-process treatment, including PCR. The complete virus-eliminating occurs in a carrier with a good immunological status. This explains the disappearance of the cytopathic effect of viral infection in the additional smear of HPV carrier.

Candidal colpitis was registered among 115 (2.5 %) women: budding yeast cells, spores and pseudomycelium in smears (fig.4).

Much less follicular cervicitis (postmenopausal) and chronic inflammation (of childbearing age) is diagnosed and detected in 2% of cases from the total number of inflammatory diseases. The maximum incidence is

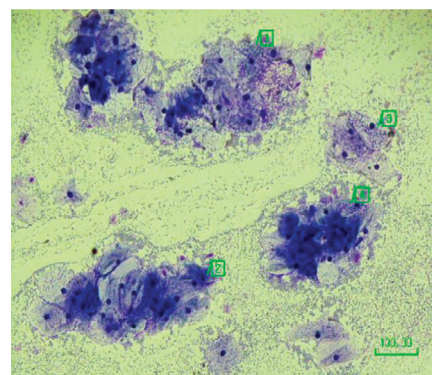
noted in age groups of 18-29 years, 47 cases (49.5 %) and 30-44 years, 25 cases (26.3%). Cytological results of this pathology are characterized by the presence of lymphoid elements (fig.5).

In most cases, trichomonas vaginitis (1.3% of cases from total number of PID) were found in age group of 18 -29 years, 49.1% (fig.6).

Urogenital chlamydiosis is one of the most common sexually transmitted infections. According to our data, 47 cases (1%) were diagnosed with remote causes of chlamydial infection (fig.7). The highest incidence was registered in the age group of 30-44 years (38.3 %). The data of cytological examination in the detection of chlamydial infection are indicative and should be supplemented by other research methods (immunofluorescence analysis, polymerase chain reaction, etc.).

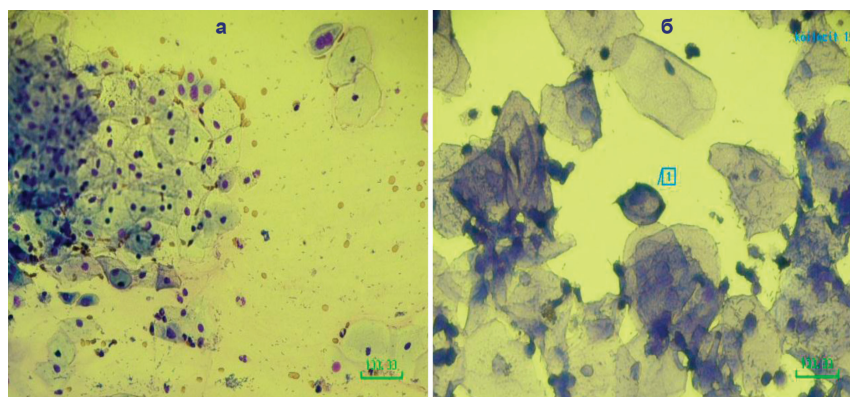
**Conclusion:** Hereby, the results of cytological examination (fig.8) revealed that inflammatory diseases of sexually transmitted infections dominate among women aged 18-29 years (49.5%).

The main reason is the increased sexual behavior of young people, which registered at this age period. Frequent sexual partners changes are causes dysbiosis of the vaginal flora. Usually, chronic inflammation occurs on young



**Fig.1.** The abundance of small bacteria, «clue cell» in their smear ectocervix with bacterial vaginosis, x200





**Fig.2.** Binuclear or «kissing» nuclei in cervix smear for papillomavirus infection (conventional smear) and koilocyte for liquid-based cytology (staining method by Romanovsky-Gimza), x400

women, who take oral contraceptives and using the intrauterine device. In the middle age group (30-44 and 45-59), genital infections and dysbiosis are balanced, which associated with a stabilization of family relations.

The maximum frequency of remote causes of viral infection depends on age that shows the peak detection in the age groups of 18-29 years and 30-44 years. HPV infection disappears by itself within 12 months after diagnosis date in about 70% of young women cases. Generally, long-term preservation of viral HPV is associated with high-oncogenic risk types of HPV infection (mainly HPV 16) [2]. Remote causes of viral infection were found rarely (2.9%) on menopause, but it has the important prognostic value, which can predict the risk of cervical pathology development.

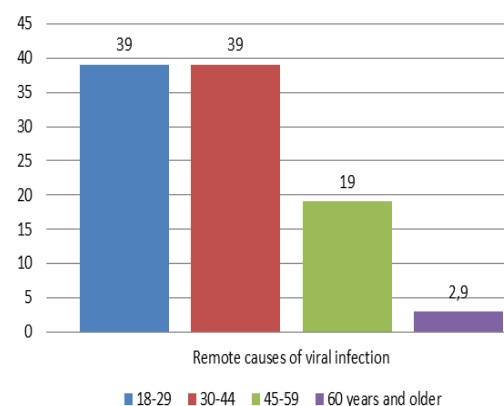
Inflammation processes (senile vaginitis) are found in the old age group of women (20,9%), which is due to the intensive influence of sex hormones (estrogens). At this period the lack of estrogen harms the main protective properties of the stratified squamous epithelium. As a result, the number of lactobacilli is decreased or completely disappeared by the cause of conditionally pathogenic and pathogenic flora overgrowth.

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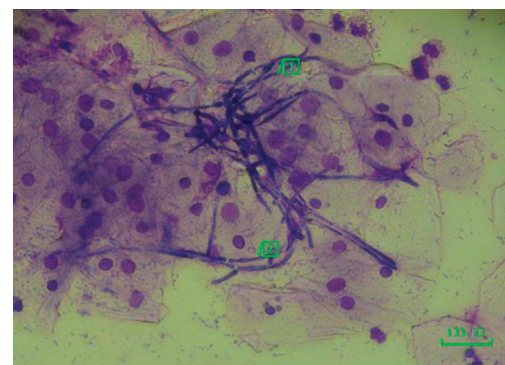
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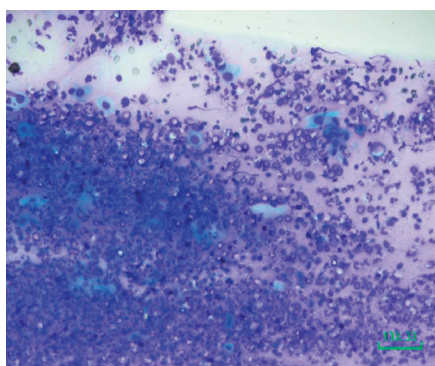
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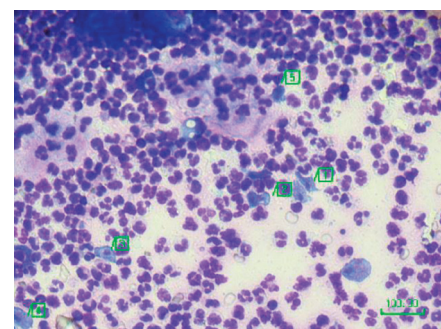
**Fig.3.** The frequency occurrence of remote causes of viral infection in different age groups



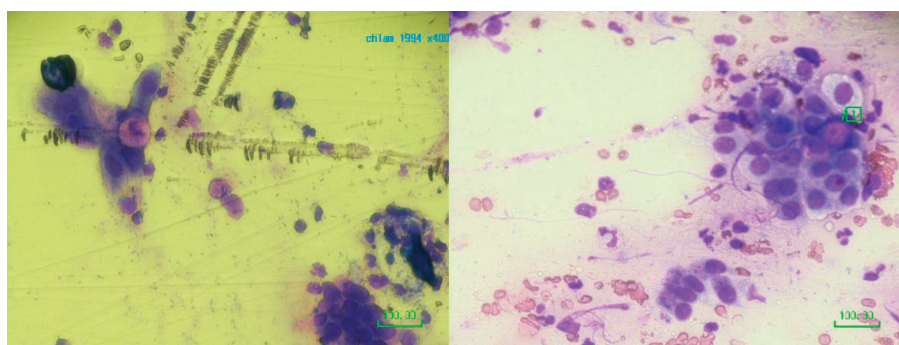
**Fig.4.** Thrush. Pseudomycelium and fungal spores in the smear from the cervix, x400



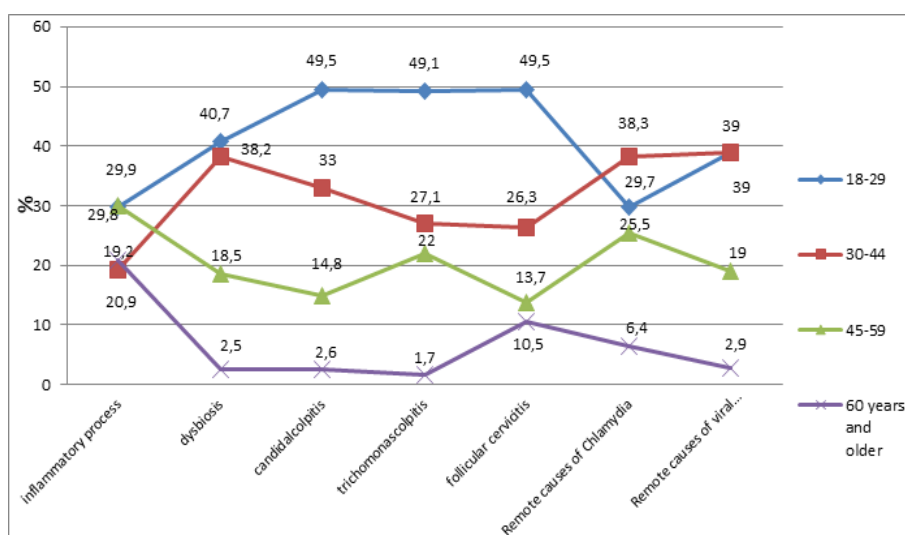
**Fig.5.** Follicular cervicitis. x200



**Fig.6.** Trichomonas and leucocytes in a smear from the ectocervix with trichomonas colpitis. X400



**Fig.7.** Layers of metaprotegerol epithelium cells with vacuoles of various size, which contain fills associated with different stages of the chlamydial infection development. x400



**Fig.8.** The rate of incidence of cervix inflammatory diseases among women of different age groups

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#### The authors

1. Kirillina Maria - candidate of Biological Sciences, Senior Research Scientist, Head of Yakut Science Centre of complex medical problems laboratory, Head of M.K. Ammosov North Eastern Federal University Medical Institute Clinic laboratory, kirillinaamp@mail.ru, Yakutsk, Russia;

2. Ivanova Anna - clinical pathologist of M.K. Ammosov North Eastern Federal University Medical Institute Clinic, ivanova.ak11@gmail.com, Yakutsk, Russia.

3. Lushnikova Elena Leonidovna: Doctor of Biological Sciences, Professor, Head of Institute of Molecular Pathology and Pathomorphology Federal State Budget Scientific Institution «Federal Research Center of Fundamental and Translational Medicine» 630117, Novosibirsk, Timakov's Str., 2; tel.: +7 (383)334-80-03; pathol@inbox.ru.

V.M. Nikolaev, E.V. Tsybandina, E.V. Rumyantsev E.K.,  
S.I. Sofronova, F.V. Vinokurova, S.D Efremova., E.N.  
Aleksandrova, F.G. Ivanova, P.M. Ivanov, S.A. Fedorova

## EVALUATION OF GLUTATHIONE SYSTEM INDICATORS IN THE BODY OF PATIENTS WITH LUNG CANCER

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#### ABSTRACT

Glutathione is very important in cells protecting, however, its high concentration in tumor cells can increase their survival by raising resistance to chemotherapeutic drugs and free radical oxidation. The effectiveness of chemotherapy treatment often depends on the individual genetic characteristics of the patient, his sensitivity to pharmaceutical drugs. According to scarce existing research it is indicated that tolerability of chemotherapy among Asians is lower compared to Caucasians. In this regard, we decided to evaluate the influence of ethnicity on the indicators of the glutathione system in patients with lung cancer and persons not suffering from oncopathology.