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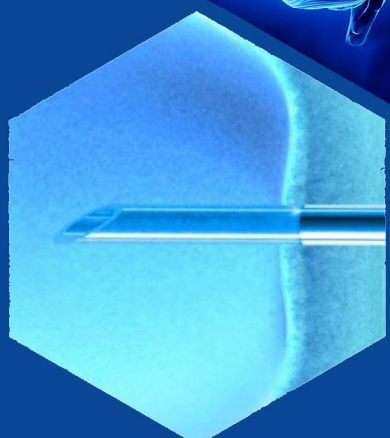
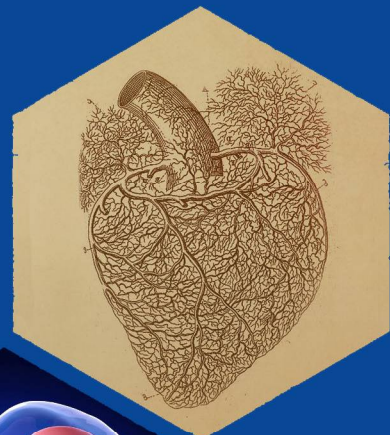
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MICROBIOLOGICAL RECOGNITION OF ANTIBODIES TO ANTIGENS OF MICROORGANISMS IN WOMEN WITH INFLAMMATORY DISEASES OF THE GENITAL

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ABSTRACT

This article intends to study and determine the diagnostic value of determining the titers of antibodies to antigens of certain etiological agents of inflammatory diseases of the genitalia in women of childbearing age. The Subject and methods are to achieve the goal, 304 women of reproductive age with inflammatory diseases of the genitals were studied. ELISA settings were performed using diagnostic test systems for determining serum antibodies to antigens Chlamydia spp, Toxoplasma gondi, Mycoplasma spp, Cytomegalovirus, herpes simplex vi ruses type 1 and 2 - HSV 1,2 (test systems from XEMA, RF) Ureoplasmaurealyticum (test system of the company "Vector-Best", Russia). Antibodies to Mycoplasma spp were detected in the examined women; they were detected in 115 cases ($35.5 \pm 3,1\%$). It turned out that the monoculture of microorganisms is detected 3.2 times more often than associations, in 6,7% of cases negative samples are detected. Most antibodies were detected against antigens of other species Mycoplasma spp, Chlamydia spp, Cytomegalovirus and Herpes simplex virus types 1 and 2. A total of 287 positive samples were found, including 55 monocultures and 232 microorganisms. Women who were examined most often in association met with cytomegalovirus and Chlamydia spp 15 times, Mycoplasma spp 10 times with other microorganisms and with each other.

Keywords: Enzyme immunoassay, women, inflammatory diseases of the genitals, antibodies, antigens.

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МИКРОБИОЛОГИЧЕСКОЕ РАСПОЗНОВАНИЕ АНТИТЕЛ К АНТИГЕНАМ МИКРООРГАНИЗМОВ У ЖЕНЩИН С ВОСПАЛИТЕЛЬНЫМИ ЗАБОЛЕВАНИЯМИ ГЕНИТАЛИЙ

АННОТАЦИЯ.

Данная статья предусмотрена изучению и определению диагностическую ценность определения титров антител к антигенам некоторых этиологических агентов воспалительных заболеваний гениталия у женщин детородного возраста. Для достижения цели были исследованы 287 женщины репродуктивного возраста с воспалительными заболеваниями гениталий. Для настройки ИФА использовались диагностические тест-системы для определения сывороточных антител к антигенам *Chlamydia*spp, *Toxoplasma*gondi, *Mycoplasma*spp, *Cytomegalovirus*, вирусов простого герпеса типа 1 и 2 - HSV 1,2 (тест-системы компании «ХЕМА», РФ) *Ureoplasma*urealyticum (тест-система фирмы «Вектор-Бест», Россия). В результате у обследованных женщин выявлялись антитела к *Mycoplasma*spp, они были обнаружены в 115 случаях ($35,5 \pm 3,1\%$). Выяснилось, что монокультуру микроорганизмов выявляют в 3,2 раза чаще, чем ассоциации, в 6,7% случаев обнаруживаются отрицательные образцы. Большинство антител были обнаружены к антигенам других видов *Mycoplasma*spp, *Chlamydia*spp, *Cytomegalovirus* и *Herpes*simplexvirus типа 1 и 2. Всего было найдено 287 положительных образцов, среди которых 55 монокультуры и 232 микроорганизмов. У женщин чаще некоторые обследовались в ассоциации, встречались с цитомегаловирусом и *Chlamydia*spp 15 раз, *Mycoplasma*spp 10 раз с другими микроорганизмами и друг с другом.

Ключевые слова: Иммуноферментный анализ, женщины, воспалительные заболевания гениталий, антитела, антигены.

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**GENITALLARNING YALLIG'LANISH KASALLIKLARI BO'LGAN AYOLLARDA
MIKROORGANIZMLAR ANTIGENLARIGA ANTIBIOTIKLARNI MIKROBIOLOGIK
TAN OLISH**

ANNOTASIYA

Ushbu maqola tug'ish yoshidagi ayollarda genital organlarning yallig'lanish kasalliklarining ayrim etiologik agentlari antijenlariga antikorlarning titrlarini aniqlashning diagnostik ahamiyatini o'rganish va aniqlashni nazarda tutadi. Maqsadga erishish uchun reproduktiv yoshdagi 287 ayol jinsiy a'zolarning yallig'lanish kasalliklari bilan o'rganildi. Elishayni to'g'rilash uchun *Chlamydia*spp, *Toxoplasma*gondi, *Mycoplasma*spp, *Cytomegalovirus*, 1 va 2 tip herpes simplex viruslari - HSV 1,2 ("ХЕМА" kompaniyasining test tizimlari), *Ureoplasma*urealyticum ("Вектор-Бест" sinov tizimi firmasi, Rossiya). Natijada, tekshirilgan ayollarda *Mycoplasma*sppga antikorlar aniqlangan, ular 115 holatda aniqlangan ($35,5 \pm 3,1\%$). Ma'lum bo'lishicha, mikroorganizmlarning monokulturasi uyushmalarga qaraganda 3,2 barobar ko'proq aniqlanadi; 6,7% hollarda salbiy namunalar topiladi. Aksariyat antikorlar boshqa turdagi *Mycoplasma*spp, *Chlamydia*spp, *Cytomegalovirus* va *Herpes*simplexvirus 1 va 2 turdagi antijenlarga qarshi aniqlandi. Hammasi bo'lib 287 ta ijobiy namunalar, shu jumladan 55 monokultura va 232 mikroorganizmlar topildi. Ayollarda ularning ba'zilar uyushgan holda tekshirilgan, *Cytomegalovirus* va *Chlamydia*spp bilan 15 marta, *Mycoplasma*spp bilan 10 marta boshqa mikroorganizmlar va bir-biri bilan uchrashgan.

Калит so'zlar: Elishay, ayollar, jinsiy a'zolarning yallig'lanish kasalliklari, antikorlar, antijenlar.

Introduction. Inflammatory diseases of the genitals are characterized by different symptoms depending on the level of destruction and the strength of the inflammatory response. The disease develops as a result of penetration of the pathogen through sexual contact and in the presence of favorable conditions for its reproduction. Such conditions are created in the postpartum and post-abortion periods, during menstruation, for various intrauterine manipulations [1,5]. A decisive role in the onset of inflammation is played by the state of the microorganism, the massiveness of the

infection, and the virulence of the etiological agent [2]. It was found that the pathogenic microorganism (PM) not only causes inflammation of the pelvic organs, but also is the cause of intrauterine and neonatal infections [1].

According to statistics all over the world in recent years there has been an increase in the frequency of inflammatory diseases in the reproductive system of women. In Uzbekistan, over the past 5 years, the incidence of inflammatory diseases of the pelvic organs has increased by 30% and continues to grow. Moreover, in more than half of the cases, modern inflammatory diseases of the genitals have erased clinical symptoms, while each of the generally accepted diagnostic and laboratory parameters has deviations from the norm in less than half of the cases [3,9].

In this regard, microbiological tests are of high diagnostic value in the diagnosis of PID. Along with the methods of bacteriological diagnostics, other methods have been widely used in recent years, in particular immunoassay - ELISA [4]. ELISA is an immunological laboratory method for the qualitative determination and quantitative measurement of antigens. ELISA is based on the principle of interaction of immunosorbent - pathogen-antigen with antibodies in combination with antigen-antibody-complex with immunoglobulins containing an enzyme label [3].

Purpose of the study. Study and determination of the diagnostic value of detecting antibody titers to antigens of some etiological agents of inflammatory diseases of the genitals in women of childbearing age.

Materials and methods. To achieve the goal, 287 women of reproductive age with inflammatory diseases of the genitals were studied. All patients were treated in the Bukhara city maternity complex in the department of gynecology and the Khorezm branch of the Republican Scientific Center for Emergency Medical Aid of the Ministry of Health of Uzbekistan. They were distributed by age as follows: 18–21 years old - 12 patients ($3.9 \pm 1.1\%$), 22–29 years old - 136 patients ($44.7 \pm 2.9\%$), 30–35 years old - 56 patients ($18.5 \pm 2.2\%$), 36–49 years old - 100 patients ($32.9 \pm 2.7\%$). The majority of women were married ($97.7 \pm 0.9\%$), rural residents were $69.4 \pm 2.6\%$, and urban $30.6 \pm 2.6\%$. Among all surveyed women, the majority were housewives and non-working women ($84.5 \pm 2.1\%$). Patients often have acute vaginitis, cervicitis, bacterial vaginosis ($98.4 \pm 0.7\%$). The diagnosis was confirmed using clinical, instrumental, and laboratory studies as suggested by the National Center for Disease Control and Prevention (CDC, USA, 2016). [5]

To adjust the ELISA, diagnostic test systems were used to determine serum antibodies to antigens Chlamydia spp, Toxoplasma gondii, Mycoplasma spp, Cytomegalovirus, herpes simplex viruses 1 and 2 - HSV 1,2 (test systems of the "XEMA" company, Vector-pyrtest system, Russian Federation) Ureapolytic. The principle of the method is the qualitative detection of antibodies to the aforementioned antigens using an indirect ELISA test on polystyrene. The results were obtained by the spectrophotometric method at a wavelength of 492 nm.

During this study, all ethical principles for medical research involving humans, the Declaration of Helsinki adopted by the World Medical Association in 1964 (last addition in Seoul at the 59th General Assembly of the World Medical Association in 2008) were followed. traditional methods of variation statistics, all results and conclusions are based on the principles of evidence-based medicine.

Research results and discussion. The results obtained showed that antibodies are not always detected by the above pathogens. In most cases, antibodies to Mycoplasma spp were detected in the examined women, they were detected in 115 cases ($35.5 \pm 31\%$). It is known that in the genus Mycoplasma in practical medicine the main place is occupied by the species M.hominus, M.genitalium and M.pneumoniae. All these types are common antigenic determinants, and the ELISA method for their determination separately is not possible. Considering that Mycoplasma spp causes acute and chronic inflammatory diseases of the urinary tract, they may be the etiological agents of PID in women [7].

Antibodies to Chlamydia spp were next in terms of detectability - $27.0 \pm 2.5\%$ ($n = 82$). The main representative of this kind, which can be the causative agent of TORCH infections, is C. trachomatis, others (C. psittaci and C. pneumoniae) rarely cause disease in humans [8]. The detection

of the specific activity of serum IgG antibodies reflects the degree of multiplication of Chlamydia spp. Detection of IgG antibodies can be used to establish and monitor disease recurrence during infection.

A distinctive feature of our study was that most often antibodies to such antigens were detected - cytomegalovirus (CMV) and herpes simplex virus 1 and 2 (HSV 1.2), respectively, in $20.4 \pm 2.3\%$ ($n = 62$) and $12.5 \pm 1.9\%$ ($n = 38$) of cases. Considering that CMV occurs in 60-90% of the adult population, the problem of CMV in women, especially pregnant women, is very serious. [5,6] Although IgG antibodies do not protect against latent virus reactivation, they can serve as an indirect indicator of CMV activity in a woman's body. HSV 1 and 2 (herpes simplex virus types 1 and 2) are also very common, affecting about 90% of the population [6]. In women, HSV 2 (genital herpes) is especially common, and the detection of IgG antibodies indicates remission or relapse of herpes simplex.

Relatively few antibodies were detected against Toxoplasma gondii ($5.9 \pm 1.4\%$, $n = 18$) and Ureaplasma urealyticum ($3.3 \pm 1.0\%$, $n = 10$). It is known that IgG antibodies to Toxoplasma gondii have a protective function and provide stable immunity against re-infection [10], therefore, the determination of IgG antibodies to Toxoplasma gondii is used to determine immunity against Toxoplasma in women. The same diagnostic task was pursued by the determination of IgG antibodies to Ureaplasma urealyticum [8] ...

In total, 330 cases of positive samples were detected in 304 women, but it should be borne in mind that negative samples were found in $7.6 \pm 1.5\%$ ($n = 23$) of the women examined. Consequently, 330 positive samples were found in 281 women with inflammatory diseases of the genitals. The percentage of antibody detection in healthy women who did not have inflammatory genital diseases was low and significantly different from women with inflammatory genital diseases ($P < 0.001$).

Given the fact that the identification of positive samples was observed in the form of monocultures and microbial associations, it was interesting for us to study the relationship between the detection of each other.

The results show that the most common associations and antigens of CMV from different microorganisms Chlamydia spp (for $n = 20$) and Mycoplasma spp ($n = 14$). In most cases, the association was observed with the following organisms: CMV and HSV from 1.2 to $3.3 \pm 1.0\%$ ($n = 10$); And Mycoplasma spp CMV at $2.6 \pm 0.9\%$ ($n = 8$); Chlamydia and Mycoplasma species - in $2.6 \pm 0.9\%$ ($n = 8$); CMV, Chlamydia spp and HSV from 1.2 to $2.0 \pm 0.8\%$ ($n = 6$) of patients. Other associations were found from $0.7 \pm 0.5\%$ ($n = 2$) to $1.3 \pm 0.6\%$ ($n = 4$) of cases.

Revealed associations were observed between 2 and 5 microorganisms. They were as follows: 2 in the association of microorganisms was $13.8 \pm 2.0\%$ ($n = 42$), 3 in the microorganism $5.3 \pm 1.3\%$ ($n = 16$) 4 microorganisms $1.3 \pm 0.6\%$ ($n = 4$) and up to 5 microorganisms $0.7 \pm 0.5\%$ ($n = 2$) samples.

It is interesting to note that the identified monoculture of microorganisms ($n = 266$) was found 4.2 times more often than the association of these microorganisms ($n = 64$). The presence of a certain number of negative samples ($7.6 \pm 1.5\%$, $n = 23$) of the antigen of the above microorganisms in these studies indicates the detection of other etiological agents (gram-negative bacteria, gram-positive cocci, anaerobes), inflammatory diseases of the pelvic organs in women of childbearing age, in which bacteriological methods were found.

The data obtained indicate that in addition to bacteriological methods for the qualitative determination of antibodies in the blood serum of women against antigens of various microorganisms using the ELISA method, it has a certain diagnostic value and, along with other methods, it is possible to use the diagnosis of inflammatory diseases of the genitalia.

Conclusions

1. In the serum of the studied women with inflammatory diseases of the genitals, IgG antibodies to the antigens of Mycoplasma spp, Chlamydia spp, Cytomegalovirus and herpes simplex viruses' types 1 and 2 are most often detected, the least frequently detected IgG antibodies to the antigens of Toxoplasma gondii, Ureaplasma urealyticum.

2. A total of 287 positive samples were found, including 55 monocultures and 232 microorganisms. Monoculture occurred 3.2 times more often than associations of microorganisms; negative samples were found in $7.6 \pm 1.5\%$ of cases.

3. Women, who were examined most often in association, met with cytomegalovirus and Chlamydia spp 15 times, Mycoplasma spp 10 times with other microorganisms and with each other.

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