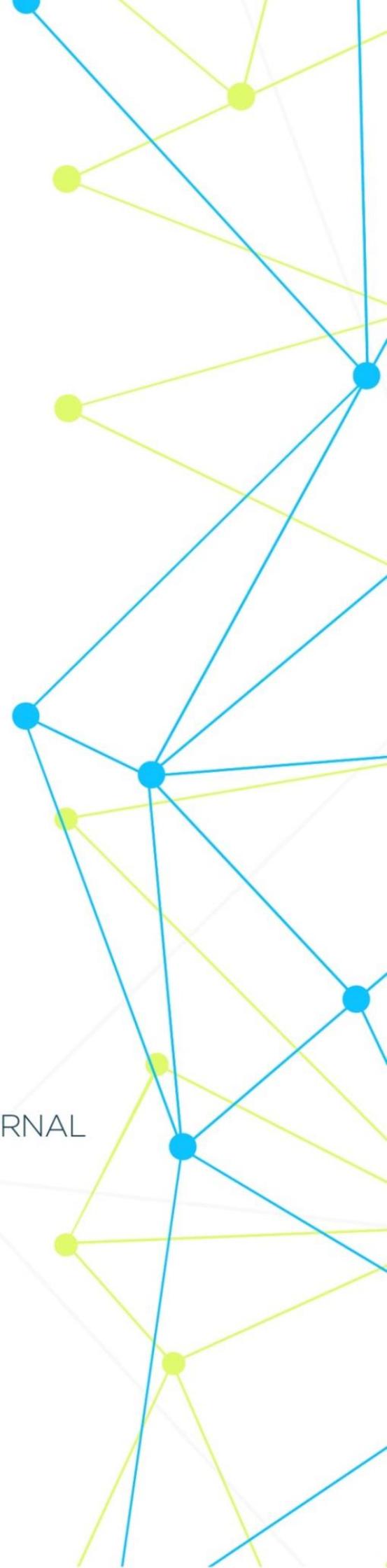


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HIV INFECTION AS A FACTOR IN THE DEVELOPMENT OF OBSTETRIC AND PERINATAL COMPLICATIONS

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Abstract

Introduction. HIV infection, despite the intensified struggle of practical world health, continues to spread, while infection among the female population of reproductive age tends to increase.

Aim: to conduct a prospective and retrospective analysis of the impact of HIV infection on the incidence of obstetric complications, as well as pathological conditions on the part of the fetus and newborn.

Materials and methods. The main group consisted of 48 pregnant women with established HIV-positive status, who underwent a set of measures to prevent the occurrence of complications of gestation. The comparison group – retrospective analysis – consisted of 119 respondents with HIV infection delivered in maternity complexes in 2018-2021. General clinical, mandatory obstetric instrumental and laboratory, as well as special research methods were carried out.

Results. The study of complications of previous pregnancies and childbirth in women infected with HIV showed that 26 (54%) women of the main group, 53 (44) % of patients in the comparison group had complications, while in the control group this figure was 6 (15%). Delivery at full-term pregnancy took place in the main group - in 96% of cases, in the comparison group - 82%, in the control group - 100%. In the main and control groups, no neonatal complications were observed. In the comparison group, neonatal complications were observed in 21 newborns (17.6%). Complications such as cerebral ischemia were observed in 21%, respiratory failure of varying severity in 18% of cases, signs of intrauterine infection in 14% of cases, perinatal lesions of the central nervous system of various origins in 18%, hypoxic-ischemic encephalopathy in 6%, convulsive syndrome in 6%, congenital malformation in 4%.

Conclusion. HIV infection is a risk factor for preterm birth and perinatal complications. Timely prevention of the occurrence of disorders in the feto-placental system helps to improve the outcome of pregnancy and childbirth in this contingent of patients.

Keywords: pregnancy, HIV infection, gestational complications, perinatal complications.

HIV infection is an important medical and social health problem worldwide. Every year the number of women of reproductive age with HIV-positive status continues to increase. In this regard, the study of the impact of HIV, as well as antiretroviral prophylactic therapy on the body of the mother and fetus, is an urgent task of modern obstetrics [4, 6, 9].

To date, the use of a specific course of drug prophylaxis - antiretroviral drugs (ARVP) during pregnancy, operative delivery, and exclusion of breastfeeding are the

main tactics for preventing vertical transmission of the human immunodeficiency virus (HIV). The use of preventive measures has reduced the risk of perinatal HIV transmission to 1–2% [2, 5, 6, 7]. Despite the advances made in pharmaceuticals, at this time, medical science does not have in its arsenal of drugs that make it possible to cure patients infected with HIV. However, the use of antiretroviral drugs improves the prognosis, the course of the disease, and significantly reduces the transmission of the virus, including perinatal [1, 6, 8].

If a pregnant woman has HIV infection on the part of the fetus, complications are observed that are directly related to placental insufficiency. These are, first of all, chronic intrauterine fetal hypoxia, fetal growth restriction syndrome, fetal hypotrophy, intrauterine infection, damage to the central nervous system, and the occurrence of antenatal fetal death [2, 4, 6, 7]. Dissociated maturation of the villous chorion resulting from which chronic placental insufficiency in patients infected with HIV develops as a result of an imbalance of proangiogenic (VEGF, bFGF, CD31) and antiangiogenic (TGF- β 1, Tsp-1) factors. When examining the tissues of the placenta during transplacental transmission of HIV, a pronounced decrease in macrophages CD68+ and CD14+ is found [4,5]. Of course, a defect in the placental barrier helps to facilitate infection of the fetus. In this regard, placental dysfunction therapy, along with specific chemoprophylaxis with antiretroviral drugs and treatment of opportunistic infections, are pathogenetically justified in the tactics of managing HIV-infected pregnant women in order to reduce both perinatal infection and rates of gestational and neonatal complications.

The purpose of the study is to conduct a prospective and retrospective analysis of the impact of HIV infection on the incidence of obstetric complications, as well as pathological conditions on the part of the fetus and newborn.

Material and research methods.

Study design:

This study was conducted on the basis of the City AIDS Center in Tashkent during 2022. 48 pregnant women diagnosed with HIV infection were under observation. A retrospective analysis was carried out on the basis of city maternity complexes No. 1, 8, 9 of the histories of childbirth and newborns of 119 HIV-infected women for 2018-2022.

Comparison groups:

The main group consisted of 48 pregnant women with an established HIV-positive status, who were given a set of measures to prevent complications of gestation. The comparison group consisted of 119 respondents of the retrospective analysis. The control group consisted of 40 HIV-negative pregnant women who were recommended planned abdominal delivery for extragenital indications.

Inclusion and exclusion criteria:

For inclusion in the study, we assessed the compliance of patients with certain criteria: the patient is registered at the dispensary in the city AIDS center in Tashkent, i.e. there is a confirmed HIV-positive status; pregnancy; reproductive age, absence of chronic infections (in particular, hepatitis B, C, syphilis), childbirth was carried out in the city maternity complexes of the city of Tashkent, gestational age was 22 weeks or more.

Criteria for exclusion from the study: an established diagnosis of AIDS, the use of drugs while taking ART, which can have a negative impact on the course of pregnancy, spontaneous or artificial termination of pregnancy up to 22 weeks of pregnancy;

A conversation was held with all the patients included in the study about the need to take antiretroviral drugs in order to prevent perinatal transmission of HIV, as well as to stabilize the process in the body. According to the obtained results of HIV viral load and indicators of the state of immunity (the absolute number of CD 4-lymphocytes, the percentage of CD 4-lymphocytes), as well as the clinical stage of the disease, an ARV therapy regimen was selected. After obtaining informed consent for HIV chemoprophylaxis, the patients were given prescription ARV drugs.

Counseling was held for those examined at the Happy Mom school, a conversation was held about the refusal of breastfeeding and the introduction of artificial feeding in order to reduce the risk of HIV transmission to the child, recommendations for further ARV therapy after childbirth.

Research methods:

In order to fulfill the tasks set, pregnant women included in our study underwent general clinical, obligatory obstetric instrumental and laboratory, as well as special research methods. The anamnestic, hematological, coagulological, biochemical, immunological, clinical parameters of pregnant women with HIV, as well as the nature of the course of pregnancy and childbirth, were analyzed.

Statistical analysis:

The systematization of the obtained data in Microsoft Excel tables has been carried out.

For statistical analysis a received V process with ce and following clinical data using the STATISTICA for system Windows (version 10) at the level of importance corresponding to the value p smaller than 0.05.

Results and discussion

Anamnestic characteristics of study groups

Among pregnant women infected with HIV (main group), the average age was 28.6 ± 3.3 with fluctuations from 19 to 45 years. Most of the patients were between the ages of 22 and 30 years - 56%. Among the women of the comparison group, patients were in the age range from 25 to 35 years old - 65%, from 17 to 25 years old - 19%, over 35 years old - 16%. When analyzing social characteristics, there is a high percentage of civil, not registered, marriages in patients with HIV, as well as a fairly large number of remarriages. Thus, a registered marriage took place in 26 (54%) patients of the main group, 18 (38%) women were in a civil marriage, 4 (8%) did not have a husband. At the same time, 1 marriage was noted in 21 (44%) women, remarriage - in 27 (56%). It should be noted that among the spouses of women with HIV, 17 (36%) are not infected, but they are informed about the status of their spouse, and 31 (64%) are registered at the dispensary in the city AIDS center in Tashkent. Among the studied women of the comparison group, 82 (69%) were officially married.

When analyzing the parity, it was found that in the main group, the majority of women were re-pregnant - 42 (88%), of which 34 (82%) were multiparous. In the retrospective group, the data were similar (Fig. 1)

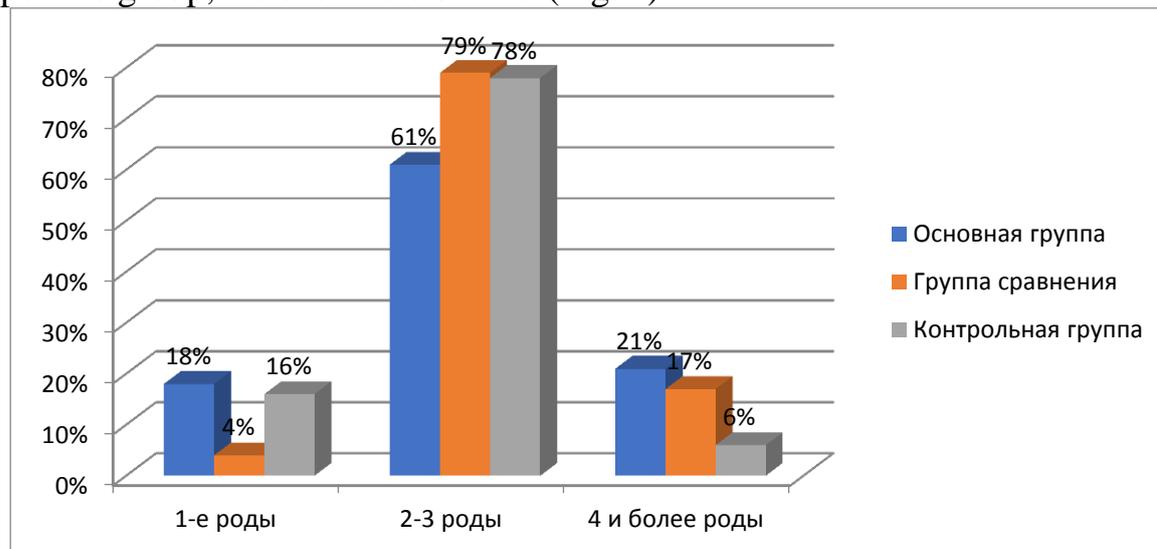


Figure 1. Parity of surveyed women.

The study of complications of previous pregnancies and childbirth in women infected with HIV showed that 26 (54%) women of the main group, 53 (44)% of patients in the comparison group had complications, while in the control group this figure was 6 (15%).

Comparative analysis of the course of this pregnancy.

The diagnosis of HIV infection was established before the onset of this pregnancy in 32 (67%) women of the main group, 86 (72%) patients of the comparison group. In 16 cases (33%) in the main group and 33 (28%) in the comparison group, HIV-positive status was established during this pregnancy. Of these, in 5 (4%) cases in the comparison group, the diagnosis was established upon admission to the maternity complex by express testing.

Antiretroviral therapy as a chemoprevention of antenatal transmission of HIV was administered to all pregnant women of the main group. In the comparison group, chemoprophylaxis was performed in the first trimester in 55% of cases, in 35% in the second trimester, and the remaining 10% in the third trimester. In the comparison group, in 6 cases (5%), ART was not carried out due to ignorance of their status, as well as due to voluntary refusal of the therapy. In 95% of cases, women received appropriate antiretroviral therapy

Comparative analysis showed that this pregnancy in the first half proceeded in the main group against the background of the threat of abortion in 9 (19%) cases, in the control group - in 7 (17.5%). In the comparison group, the threat of early termination of pregnancy was observed in 46 (39%) cases. Vomiting of pregnant women of mild and moderate severity was observed in 11 (23%) cases in the main group. In 2 (5%) women of the control group, ptyalism was also observed .

Analysis of the course of the second half of pregnancy in the examined groups showed that the threat of preterm birth in the comparison group was significantly more common - 29 (24%) cases than in the main - 3 (6%) and control - 5 (10%) groups. Also, the presence of hypertensive disorders during this pregnancy was more

often observed in the comparison group. Thus, hypertension induced by pregnancy occurred in 14 (12%) cases in the comparison group, in 3 (6%) cases in the main group, and 4 (10%) in the control group. Mild preeclampsia in the main group was observed in 3 (6%), in the control group - 2 (5%), in the comparison group - 16 (13%). Severe preeclampsia was not observed in the main and control groups, in the comparison group it occurred in 9 (7%) cases. Data on the complications of the course of this pregnancy are presented in Table 1.

Table 1

Complications of this pregnancy.

Complication	Main Group (n=48)		Comparison group (n=119)		Control group (n=40)	
	Abs .	%	Abs .	%	Abs .	%
Threat of abortion	9	19	46	39	7	17.5
Mild to moderate vomiting during pregnancy	eleven	23	23	19	15	37,5
Mild preeclampsia	3	6	16	13	2	5
Severe preeclampsia	-	-	9	7	-	-
HAG/GIB	3	6	14	12	4	10
Threat of preterm birth	3	6	29	24%	5	10%
Moderate polyhydramnios / oligohydramnios	7	14.5	49	41	8	20

Analysis of laboratory data:

According to the results of a blood test when determining the number of copies of HIV RNA in 1 ml of blood, the patients were distributed as follows: more than 1000 copies per 1 ml - in 11 (29%), from 500 to 1000 copies - in 6 (16%), less than 500 - 12 (31%), not determined - in 8 (21).

Data on a detailed general blood test in the studied pregnant women are presented in Table 2.

Table 2. Study of a complete blood count in pregnant women of the main and control groups

Index	Main group (n=38)	Control group (n=40)
WBS (Leukocyte count)	6.9*	7,17 _
RBC (Red Blood Cell Count)	3.24**	4.4

HGB (Hemoglobin)	105**	116
HCT (Hematocrit) %	35.2**	38.8
MCV (Mean erythrocyte volume) f/l	76.4*	87.2
MCH (Mean erythrocyte hemoglobin) p/l	24.1*	29.4
MCHC (Mean erythrocyte hemoglobin concentration) g/l	315	328.6
PLT (platelet count)	221	220
Lymph% (relative content of lymphocytes) %	18**	26
MXD % (Relative content of medium-sized cells (monocytes +basophils +eosinophils) %	9.1*	8.6
NEVT% (relative neutrophil count) %	69.2	62.1
Lymph# (Absolute count of lymphocytes) $\times 10^9$	1.4 *	2.33 _
MXD # (Absolute content of medium-sized cells (monocytes +basophils +eosinophils) $\times 10^9$	1.1**	0.7
NEVT# (Absolute neutrophil count) $\times 10^9$	4.5*	4.96 _
RDW - SD (Erythrocyte anisocytosis) f/l	54.3**	38.6
PDW - CV (Erythrocyte Anisocytosis) %	13.3*	12.9
PDW (Platelet anisocytosis) f/l	14.5	15.5 _
MPV (Mean platelet volume) f/l	10.3	10.7 _
P-LCR (% of large platelets) %	30.1*	38.2
PCT (Thrombocrit) %	0.23*	0.3
ESR (Erythrocyte Sedimentation Rate) mm)/h	12*	18

Note: *-significant difference at the level of $p < 0.05$ according to t -criterion in relation to the control group. ** - significant difference at the level of $p < 0.01$ according to the t -criterion in relation to the control group.

Data on the impact of HIV infection on the state of the biochemical blood picture are shown in Figure 2. According to the results, no statistically significant differences in the biochemical and coagulation system of the blood in the main and control groups were found.

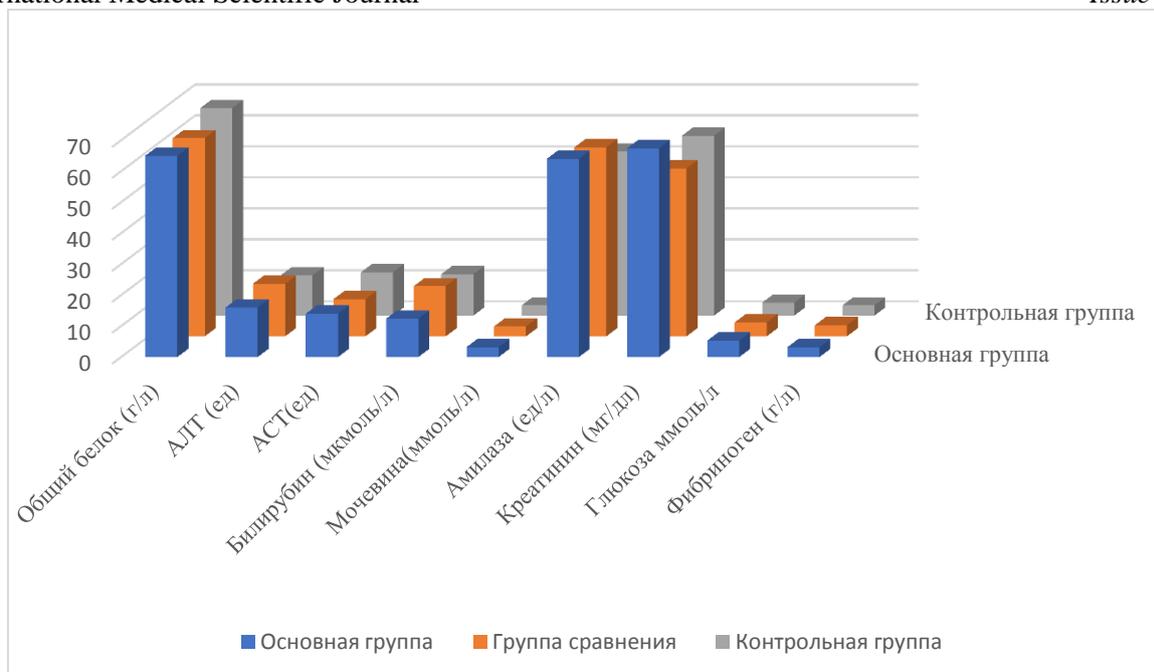


Figure 2 Study of some indicators of the blood coagulation and biochemical system in pregnant women with a positive HIV status

Analysis of the results of Doppler utero- placental -fetal blood flow in the III trimester of pregnancy showed that in the main group of hemodynamic disorders were not detected in 66% of cases, in 28% there was a violation of utero- placental -fetal blood flow I A degree, disorders in the utero- placental -fetal blood flow I B degree - 6%.

The analysis of childbirth showed that in the main group women were delivered by caesarean section in 100% of cases, while there was a full-term pregnancy in 96% of cases. Among the complications of childbirth, prenatal rupture of the membranes was observed in 6%, mild PONRP - 4%. In the comparison group, 82% of women delivered by caesarean section. At the same time, in the gestation period from 33 to 36 weeks - 22%, 37-39 weeks - 74%, at 41 weeks - 4%. Among the complications of childbirth, prenatal rupture of the membranes was observed in 18% of cases, mild PONRP - in 12%, severe - 6%. In the control group, all 100% of women were delivered by caesarean section for extragenital and obstetric indications in a planned manner. Prenatal rupture of membranes occurred in 4%, mild PONRP - in 4% of cases.

Analysis of data on the state of the newborn showed a fairly high percentage of neonatal complications in the comparison group - 22%. Low weight of the newborn by the gestational age was observed in 24% of cases. The average weight is 2300 ± 200 grams, in the range from 1560 to 3400 grams. The average height of newborns was 47 ± 2 cm, ranging from 41 to 52 cm. The assessment of newborns on the Apgar scale averaged 7 points at 1.8 points at 5 minutes after birth, however, within 48 hours after birth, neonatal complications were observed in 21 newborn (17.6%). Complications such as cerebral ischemia were observed in 21% of cases, respiratory failure of varying severity - in 18% of cases, signs of intrauterine infection - in 14% of cases, perinatal CNS lesions of various origins - 18%, hypoxic-ischemic encephalopathy - 6%, convulsive syndrome - 6%, congenital malformation - in 4%.

In the main group, the average weight of newborns was 3300 ± 200 grams, in the range from 2800 to 4200 grams. No neonatal complications were observed. In the control group, the average weight of newborns was 3400 ± 200 grams, no neonatal complications were observed.

Conclusion: Thus, the analysis of the anamnestic characteristics revealed a conscious planned pregnancy in HIV-positive women who are aware of their status in 67% of cases. In most women with HIV infection, this pregnancy was repeated. According to a retrospective analysis, a high rate of obstetric and neonatal complications was found in pregnant women with a positive HIV status. As the results of the study showed, preventive measures aimed at improving the functioning of the fetoplacental complex in HIV-infected women help to reduce the level of gestational disorders, premature birth, and childhood morbidity.

Bibliography:

1. Belotserkovtseva L.D., Kovalenko L.V., Tefnants N.A., Kasparova A.E. Morphological and functional changes in the placenta in patients with HIV with viral infection of children with infection // Bulletin of the Novgorodsk State University - 2018.- No. 6 (112) C .4-8
2. Indiaminova G.N. Influence of Covid-19 on the state of the hemostasis system in pregnant women in different trimesters. Research journal for the study of trauma and disability. 2.3 (April 2023), pp.95-98. <http://journals.academiczone.net/index.php/rjtds/article/view/680>.
3. Makatsaria A.D., Bitsadze V.O., Khizroeva D.Kh., Khamani I.V. Placental insufficiency in complicated pregnancy and the possibility of using dipyridamole. Obstetrics, gynecology and reproduction. 2016; 4:72-82
4. Mozaleva O.L., Samarina A.V. Features of the course of pregnancy and childbirth in HIV-infected women // Journal of Obstetrics and Women's Diseases. 2021. V. 70. No. 3. S. 103–113. DOI: <https://doi.org/10.17816/JOWD48672>
5. Niauri D.A., Kolobov A.V., Tsinzerling V.A., Gzgzyan A.M., Dzhemlikhanova L.Kh., Kolobova O.L., Khubulava N.V. Human placenta as an epidemic risk factor for vertical transmission of HIV in conditions of comorbidity // HIV-infections and immunosuppression . 2016. V. 8, No. 4.S. 7–16.
6. Safarova L. A., Abdullaeva L. M. Pregnancy and HIV infection // PROBLEMS OF MEDICINE AND BIOLOGY: Scientific literature reviews and articles Proceedings of the International Scientific and Practical Conference of Young Scientists and Students R Emerovo, April 14-15, 2022.-p. 21-25 [http://repository.tma.uz/xmlui/bitstream/handle/1/5487/sbornik_14-15.04.2022%20\(2\).pdf?sequence=1](http://repository.tma.uz/xmlui/bitstream/handle/1/5487/sbornik_14-15.04.2022%20(2).pdf?sequence=1)
7. Yatsenko D.S. The course of pregnancy, childbirth and the condition of newborns in women infected with HIV - infection. Bulletin of Medical Internet Conferences (ISSN 2224-6150) 2015. Volume 5. Issue 5. P.448
8. Kattakhodjaeva MH, Rakhmanova NH// Influence of hormonal injectable contraception on health condition of women of different reproductive age Higher Education / The Ninth European Conference on Biology and Medical Sciences "East West" Association for Advanced Studies Vienna, Austria, 2016.-P.51- 55

9. Safarov Aliaskar Tursunovich , Abdullayeva Lagiya Mirzatullayevna , Safarova Lola Aliaskarovna , Assessment of the impact of HIV infection on the course of gestation, childbirth and the postpartum period, Journal of reproductive health and uro -nephrology research 2022, vol. 3, issue 4. pp.65-67
<http://dx.doi.org/10.5281/zenodo.7420945>

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