

ANNOTATION

Of the dissertation work of Bilibaeva Galiya Zhanuzakovna on the topic:
"Improving the organization of pregravidar preparation", submitted for the degree
of Doctor of Philosophy (PhD) in the according in the specialty 8D10101 - "Public Health"

Relevance of the Problem

The relevance of the problem of HIV infection and pregnancy on a global scale continues to be extremely high, which is associated with the global prevalence of HIV, the impact of the infection on women's reproductive health, as well as the risks of mother-to-child transmission. Today, according to the United Nations Joint Program on HIV/AIDS (UNAIDS), more than 39.9 million people are living with HIV, of which a significant proportion are women of reproductive age [1]. Protecting the health of expectant mothers and preventing transmission of the virus to newborns is one of the key public health issues [2].

HIV infection not only has a significant impact on a woman's health, but also poses significant risks to the child, as the virus can be transmitted vertically - from mother to child, during pregnancy, childbirth or through breastfeeding [3]. It is one of the leading causes of morbidity and mortality among newborns in developing countries.

Vertical transmission of HIV (mother-to-child transmission) remains an important challenge in the global fight against HIV/AIDS. According to WHO, about 15-45% of children born to HIV-infected women may acquire the virus without the use of preventive measures [4]. However, with appropriate treatment and timely administration of antiretroviral therapy (ART), this risk can be reduced to 1-2% [5]. Thanks to the use of ART, millions of women around the world can successfully plan pregnancies and give birth to healthy children, which emphasizes the importance of access to and implementation of effective preconception and health monitoring programs for HIV-infected women.

One of the key aspects of preventing vertical transmission of HIV is preconception preparation, which includes a set of measures aimed at optimizing a woman's health before conception. These measures help not only to reduce the risk of transmission to the child, but also to improve the mother's overall health. International guidelines for the management of HIV-infected pregnant women emphasize the importance of early initiation of antiretroviral therapy, regular monitoring of viral load, and access to psychological support for women with HIV infection [6]. At the same time, a lack of awareness among women and a lack of specialized programs at the level of local health systems remain a barrier to the widespread implementation of such measures.

The global urgency of HIV infection and pregnancy requires coordinated efforts at the global level. International organizations such as WHO and UNAIDS play a key role in developing global strategies to prevent vertical transmission of HIV, improve access to antiretroviral therapy and raise public awareness. An important step was the introduction of the Start Free, Stay Free, AIDS Free program, which aims to completely prevent mother-to-child transmission of HIV and ensure access to treatment for all women in need [7].

The urgency of the problem of HIV infection and pregnancy in Kazakhstan remains high and requires special attention from the health care system and society. Despite global efforts to combat HIV, including preventive measures and treatment, the problem remains relevant in the country, especially for women of reproductive age.

The relevance of HIV infection in the context of pregnancy in Kazakhstan and globally remains extremely high. According to the World Health Organization (WHO), in 2023, 1.3 million new cases of HIV infection were registered in the world, which emphasizes the need to continue working to prevent vertical transmission of the virus from mother to child [8]. In the Republic of Kazakhstan, the number of women living with HIV continues to grow, which creates additional challenges for the health care system.

To date, there are many effective measures to prevent mother-to-child transmission of HIV, such as antiretroviral therapy (ART), planning childbirth and lactation. Studies conducted in Kazakhstan have shown that the introduction of pregravidaral preparation and regular screening of women with HIV

reduces the risk of transmission to newborns [9].

Purpose of the study:

Optimization of pregravidar preparation of women with HIV infection by developing comprehensive measures including medical, social, psychological and educational aspects to reduce the risks of complications and HIV transmission.

Research objectives:

1. On the basis of foreign and domestic data, to evaluate the world experience in the organization of pregravidar preparation for pregnant women with HIV infection.
2. To study the peculiarities of the course of pregnancy and childbirth in HIV-infected women on the basis of retrospective analysis of the materials of the AIDS Center of Almaty for 2018-2022.
3. To analyze the medical and social characteristics of HIV-infected women in Almaty and to determine the factors affecting the preparation for pregnancy in HIV-infected women.
4. To assess the awareness of women of reproductive age in Almaty on HIV infection.
5. Develop measures to improve the organization of pregravidar preparation in women with HIV-positive status.

Research methods:

Retrospective analysis of statistical data, quantitative research - sociological research (questionnaires), qualitative research - conducting in-depth interviews, statistical.

Research Object: HIV-infected pregnant women (18-49 years old) registered at the AIDS Center of Almaty.

Subject of the research:

Socio-demographic characteristics, behavioral features, risk factors, and the organization of medical support for HIV-infected pregnant women registered at the AIDS Center in Almaty.

Main points submitted for defense:

1. Despite the successful results of treatment, the study revealed problems in the control of HIV infection, as well as the need to improve the interaction between medical institutions and the work of the HIV treatment program in pregnant women. The results of the study may become the basis for further improvement of medical care for women with HIV infection, as well as for the development of new recommendations for the management of such patients during pregnancy and childbirth.
2. Low adherence of HIV-infected pregnant women to pregravidar preparation and preventive measures, lack of knowledge about the importance of adherence to antiretroviral therapy and regular medical follow-up indicates low adherence to treatment, which increases the risk of vertical HIV transmission and complications during pregnancy and labor.
3. The developed educational program for health care providers is aimed at improving their knowledge and skills in working with HIV-infected women, including aspects of diagnosis, treatment and prevention. The program contributes to raising awareness about pregravidar preparation, which will enable health workers to interact more effectively with patients, providing timely medical care and minimizing the risks of HIV transmission from mother to child.
4. The developed comprehensive model of pregravidar training for HIV-infected women demonstrates its importance in reducing the risk of vertical HIV transmission and improving reproductive health. Based on a multidisciplinary approach, it increases the effectiveness of medical support by combining modern methods of antiretroviral therapy, viral load monitoring and social support. Application of the model in both primary health care and specialized centers contributes to early detection of HIV, control of the condition and reduction of complications in mothers and children.

Scientific novelty

1. The developed integrated approach to pregravidar preparation described in the study is a comprehensive model that includes several key aspects: medical, social, psychological and educational. The inclusion of these aspects in the system of preparation of women with HIV status allows for more effective minimization of risks to the health of mother and child, as well as improving the quality of life of women during pregnancy.

2. Continuous training of doctors and nursing specialists of PHC organizations, as well as HIV-infected women, reduces the risk of complications and mother-to-child transmission of HIV; increases adherence to treatment from 3.3% in 2021 to 20% in 2022; improves the rate of early treatment uptake, as the period of ART prophylaxis initiation in HIV-infected women decreases by 13%, from 38.6 weeks in 2021 to 33.0 weeks in 2022.

3. The developed and tested training program for health workers on prevention, diagnosis and treatment of HIV infection, as well as on raising awareness on pregravidar preparation of HIV-infected women and the possibility of giving birth to a healthy child reduced the number of pregnancy terminations before 12 weeks from 20.0% in 2021 to 3.8% in 2022.

4. The proposed early screening for HIV-infected women "Living with HIV" will make it possible to offer a set of measures to reduce the risks of complications and HIV transmission.

Description of the main results of the study

The study achieved the objectives of optimizing the preventive measures of pregravidar preparation of HIV-infected women. The main findings of the study include:

Analysis of enrollment status and medical risks: The mean age of the pregnant women studied was 31.4 ± 5.3 years. The number of pregnant women seen at the AIDS Center decreased from 2018 to 2022 from 20.7% to 16.1%, but there was an increase of 5.6% in 2019. The mean time of presentation at antenatal clinics remained stable (10.4 ± 8.3 weeks), but there was an increase in spontaneous miscarriages (7.3%) ($p = 0.008$), highlighting the need to improve early medical follow-up and risk factor analysis. Planned cesarean section was used in 26.2% of cases, emergency delivery in 28.3%, and emergency cesarean delivery in 15.0%. In 2022, the incidence of emergency delivery increased significantly (24.5%) ($p < 0.05$). Viral load type "<" increased significantly from 10.5% in 2018 to 79.7% in 2022, and type "=" decreased from 89.5% to 20.3%. Sexual route remains the leading mechanism of HIV transmission (91%, $p < 0.01$). Pregnant women face a variety of comorbidities, which complicates the management of pregnancy.

The timing of ART prophylaxis initiation in pregnancy increased from 2018 to 2021. The mean timing of ART initiation during this period was 36.8 ± 3.4 weeks. In 2018 it was 34.0 ± 6.0 weeks and in 2021 it was 38.6 ± 0.5 weeks, indicating delay and increased risks. In 2022, it decreased to 33.0 ± 1.4 weeks, indicating improved practices in early HIV diagnosis and prevention.

Between 2018 and 2022, the cesarean section rate was 60.8%. The rate was 63.7% in 2018, peaked in 2019 (65.0%) and decreased to 55.0% in 2021. Natural births accounted for 39.2% on average, increasing to 45.0% in 2021 but decreasing to 37.5% in 2022 ($p < 0.05$).

The most common gynecologic diseases among women in the study group were candidal vulvovaginitis 28.0 and inflammatory diseases of the vagina and vulva, including chlamydia and trichomoniasis, averaging 26.0% over the entire period. Inflammatory diseases of the cervix occurred in 10% of cases, salpingitis and oophoritis in 4.6%, and the incidence of gonococcal inflammation of the female pelvic organs was 3.3%. These data emphasize the importance of timely diagnosis and treatment of gynecological diseases for the health of women, especially in the presence of infections that can lead to complications in the absence of therapy. The results obtained have high statistical significance ($p < 0.001$).

According to the results of the social survey: the mean age was 30.33 ± 10.97 years, indicating significant age differences. The prevalence of de facto marriages (38.5%) indicates the prevalence of civil unions, and 31.9% of single mothers emphasize the need for social support. 23.1% of respondents were unemployed, which indicates economic instability. 47.3% assessed their financial situation as satisfactory, but 17.6% live in poverty and 2.2% live in extremely difficult conditions. Most women have temporary jobs (53.8%), and only 6.6% have higher education. The main route of HIV transmission among pregnant women is sexual (81.3%). Parenteral route was noted in 12.7% of respondents, mother-to-child transmission - in 2.2%, which confirms the effectiveness of prevention. Combined route (sexual and parenteral) was registered in 5.5% of women. The clinical picture of the interviewees showed that 64.8% of pregnant women were found to have early stage HIV infection, indicating early diagnosis and possible effectiveness of prevention measures. Acute infection was detected in 26.4% of women, which

requires special attention due to high viral load. Latent stage was recorded in 5.5% and 2.2% of women were at AIDS stage, which requires special attention. In our study only 3.3% of women planned pregnancy and in 20.9% conception was a mutual decision. Complications during pregnancy and delivery were observed in 95.6% of the participants. The most common were early toxemia (20.9%) and sexually transmitted infections 16.5%; urinary tract infections and extragenital diseases 9.9% each, respectively.

Complications at delivery were observed in 67% of respondents, including preterm labor (32%) and low birth weight (25.3%). Almost half of the newborns (47.3%) required resuscitation, emphasizing the high health risks for mother and child.

Almost 95.6% of women experienced complications during pregnancy and 67% experienced complications during childbirth, which requires additional attention from health care providers. This also indicates the need to improve the medical surveillance system.

The results of the study showed that 92.3% of the interviewed women need social support. Half of them turn for help to relatives (50%), and 26.4% - to state institutions. Social and psychological support is needed by 40.7% of respondents, and 74.7% of women turned to the AIDS Center for help. The main difficulties associated with childbirth include material problems (47.3%), housing issues (19.8%) and problems of mutual understanding with spouses (14.3%). The high need for medical assistance is manifested in the shortage of infectious disease doctors (58.2%) and psychologists (15.4%). The physical health of children is a priority for 46.2% of women.

Despite high utilization of ART (71.4%), access to specialists is limited, which reduces the effectiveness of treatment. The problems of discrimination and stigmatization concern 20.9% of respondents, which emphasizes the importance of social support and information.

Ten women between the ages of 21 and 28 participated in the in-depth social interview, with an average age of 24 years. The level of education of the participants varied: 40% had primary education, 60% had secondary education. The majority (70%) had contracted HIV sexually from their husbands, 30% through unknown routes. Half of the female participants already had children, the rest were pregnant for the first time.

Knowledge about HIV was limited: only two women knew about vertical transmission. Most understood that HIV is sexually transmitted but had misconceptions about other routes. The main sources of information were health care providers and the internet.

Many faced social stigma and discrimination, despite the fear and stigma women sought to continue the pregnancy and give birth to a healthy child, seeing the opportunity to improve their lives and gain respect through motherhood. The study emphasizes the need to increase women's awareness of HIV prevention.

According to the results of the study of women's HIV awareness level, the majority of respondents (57.5%) are aged 20-29 years, 37.8% - 30-39 years, and 4.7% - 15-19 years. There are statistically significant differences in HIV knowledge between the 20-29 years and 30-39 years groups ($p < 0.05$), and the 30-39 years group shows a higher level of awareness.

83% of respondents have higher or incomplete higher education. The professional composition includes housewives (18%), economists (12%), teachers (11%) and students (10%). Awareness of HIV was low: 57% of respondents consider their knowledge to be limited, 11% do not know what HIV is, and 49.6% have no information about its prevalence in the region. The main sources of information are television and the Internet.

Despite the fact that 89.9% are aware of the risk of HIV infection through drug use and non-sterile instruments, and 93.3% - through unprotected sexual contacts, 10.1% mistakenly believe that HIV can be transmitted through mosquito bites or communication. Only 85% of respondents know about the possibility of free HIV counseling. 75% of respondents know about anonymous HIV testing, 87% are aware of condom protection, but only 58% correctly understand the routes of transmission. It is necessary to strengthen education on the ways of HIV transmission. Fifty-five percent of respondents know about the possibility of living a long and full life while taking antiretroviral drugs, indicating the need for further information. 65% are aware of the possibility of controlling HIV with antiretroviral therapy, but 35% still need more information. 50% of respondents noted stigmatization of HIV infected

pregnant women in health facilities and 48% felt that this affects their willingness to seek help. 43.5% have heard of cases of hiding HIV status for fear of being judged. Stigmatization hinders access to health services and worsens health.

The study developed a comprehensive approach to pregravidar y preparation of women with HIV, including medical, social, psychological and educational aspects. This makes it possible to reduce health risks for mother and child and improve the quality of life during pregnancy. A new screening method for early risk detection integrated into the preparation system has also been developed. For the first time, an educational program for health care workers was created to improve competence in working with HIV-infected women. Additionally, a mobile application has been developed to provide information and psychological support.

These results demonstrate the need for deeper integration of medical and social care, as well as active involvement of patients and health care providers in the process of informing and supporting HIV-infected women.

Practical significance of the findings

- 1.Introduction of early HIV screening in primary health care facilities will significantly increase early HIV diagnosis, which is necessary for timely initiation of antiretroviral therapy (ART), improve the condition of HIV-infected women and reduce the risk of complications.
- 2.The use of mobile applications for monitoring the health of women with HIV will guarantee continuous monitoring of their condition, will provide timely reminders about the need to take tests and ART, will also offer personalized advice, will improve adherence to treatment, will reduce the risk of missing medical appointments and will improve the quality of life of women.
- 3.Training of medical staff through professional development programs will create conditions for better and more effective care for women with HIV. Special emphasis on pregravidar y preparation and antiretroviral therapy will help to reduce the risks of complications during pregnancy, improve prognosis for mother and child, and reduce the likelihood of vertical transmission of HIV.
- 4.The application of a comprehensive model of pregravidar y preparation based on a multidisciplinary approach will ensure a comprehensive approach to the management of women with HIV, involving specialists from different fields: infectious disease specialists, obstetrician-gynecologists, psychologists and social workers. This will improve women's reproductive health, reduce the risk of HIV transmission to the fetus, and improve psychosocial support for patients.

Doctoral Candidate's Personal Contribution:

The doctoral student independently generalized and analyzed the data of domestic and foreign literature on the studied problem. The dissertant conducted bibliographic, information-analytical, statistical, sociological research, conducted questionnaires. The author personally carried out the development of research design, analyzed, summarized and statistically processed the data, prepared materials for publication and materials for practical implementation.

Conclusions:

1.The literature review considered modern methods of diagnosing HIV infection in pregnant women. It was found that prevention of mother-to-child transmission of HIV is successfully achieved through active preparation of women for pregnancy. This includes awareness raising, psychological support, social adaptation, and medical measures: antiretroviral therapy for the expectant mother and newborn, with possible use of caesarean section in case of high risk of vertical transmission.

2.Analysis of the peculiarities of the course of pregnancy and childbirth revealed that over the five-year period (2018-2022) in Almaty city there is a decrease in the number of pregnant HIV-infected women by more than 20%, registration of pregnancy is 12.9 weeks, but there is an increase in the proportion of spontaneous miscarriages (7.3%) ($p=0.008$) with significant annual differences and planned caesarean section - 26.2%. Sexual route remains the main mechanism of HIV transmission (more than 91% of cases) $p<0.01$. Time to ART initiation was in 2021. 38.6 ± 0.55 weeks and in 2022. 33.0 weeks, but utilization of ART therapy as a means of preventing fetal and infant infection remains low (5.9%). 93.2% of newborns are HIV negative.

3. Medical and social characteristics of pregnant women with HIV, the majority (47.3%) are aged 30-39 years, 38.5% are married, and 31.9% are raising children alone. 47.3% assess their financial situation as normal, 17.6% have financial difficulties. 53.8% work in temporary jobs. 19.8% use alcohol, 23.1% smoke, 7.6% use drugs. 69.2% knew about their HIV status before pregnancy, 22% found out during pregnancy. 92.3% need social support, 95.6% faced complications of pregnancy. Women face lack of information, lack of adherence to treatment, stigma and discrimination. All want to give birth to a healthy child, but need better medical care, educational programs and psychological support.

4. Assessment of the level of awareness of women of fertile age revealed that more than half (57%) of respondents recognized that their knowledge about HIV was limited. 11% of women did not know what HIV is, indicating a significant gap in basic knowledge about the disease. Awareness of HIV infection varies by age and level of education. Older women and those with higher education are more knowledgeable about HIV prevention and transmission. About 10.1% of women mistakenly believe that HIV can be transmitted through mosquito bites or by communicating with an infected person, 49.6% of women receive information about HIV from television and the Internet, but not from medical professionals, which indicates that doctors and medical staff are not sufficiently active in educating the population.

5. The proposed comprehensive model of pregravidar preparation of HIV-infected women includes the main key aspects of medical, social, psychological and educational assistance will allow to more effectively minimize risks to the health of mother and child, as well as to improve the quality of life of women during pregnancy.

Approbation of the results of the thesis

The main results of the thesis research were presented at conferences:

- II International Congress "Continuing Medical Education in the Republic of Kazakhstan" "Emergency medicine: Education, science and clinical practice" October 24-25, 2019, Almaty;
- Scientific and Practical Conference "Science and Youth: New Challenges and Ways of Solution", April 22, 2022, Almaty;
- VI International Scientific and Educational Forum "Mother and Child", May 19-20, 2023, Almaty;
- International Scientific Conference of Students and Young Scientists "Farabi əlemi", April 4-5, 2024, Almaty;
- II International Forum "Asfen.Forum, new generation-2024", June 6-7, 2024, Almaty.

Implementation of the research results into practice

3 protection documents have been developed:

1. Copyright certificate № 40443 from 05.09.2022g. "Questionnaire to study the opinion of pregnant women on improving the organization of pregravidar preparation in women with positive HIV status".
2. Copyright certificate № 54877 from 01.05.2024g. "Screening in the system of pregravidar preparation of HIV-infected women".
3. Copyright certificate № 54997 from 27.05.2024. Training program "Prevention, diagnosis and treatment of HIV infection, raising awareness of pregravidar preparation of HIV-infected women"

3 acts of introduction were approved:

According to the results of dissertation work approved and implemented measures to improve the organization of pregravidar preparation of women with positive HIV status in the "Center for AIDS Prevention and Control" in Almaty (Act of introduction, from 11.03.2024), in SCP on PCV "City Polyclinic № 14" (Act № 1011 from 14.11.2024). Act on implementation of the training program for doctors and nursing staff on HIV prevention in the "Center for AIDS Prevention and Control" of Almaty (Act of implementation, dated 20.05.2024).

Publications on the Dissertation Topic:

On the topic of the dissertation work published 5 printed works, of which: scientific publications in the journal indexed by the database Scopus - 1.

1. Epidemiological Analysis of HIV/AIDS in Kazakhstan During 2018-2020. Journal of Research in Health Sciences (JRHS), 2023., Jun 29;23(2): e00580. DOI: 10.34172/jrhs.2023.115. ISSN 2228-7795;

In journals recommended by the Committee for Quality Assurance in Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan (4 articles).

1. Features of organizing and improving pre-pregnancy preparation. Science of life and health. - №2, 2020. P.172-178. ISSN 2415-7414. DOI: 10.24411/1995-5871-2019-10102.

2.HIV infection of pregnant women and pregravidar preparation (literature review). Bulletin of KazNMU. - №1, 2022, P. 7-17. ISSN 2524-0684.

3. Features of the impact of HIV infection on pregnancy. Pharmacy of Kazakhstan. №6, 2022,P.54-58. ISSN 310-6115. DOI: 10.53511/PHARM.KAZ.2022.82.38.008.

4.Medico-social research on HIV infection among pregnant women. Pharmacia of Kazakhstan. №5, 2024, P.158-162. ISSN 3006-0818. DOI: 10.53511/PHARM.KAZ.2024.48.87.019.

Volume and structure of the dissertation:

The dissertation work is outlined on 130 pages. The structure is represented by the following elements: normative references, definitions, list of abbreviations and notations, introduction, literature review, materials and methods of research, chapter of own research, conclusion, list of used sources and appendices. The dissertation is illustrated with 32 tables and 36 figures, as well as 3 schemes. The bibliographic list contains 145 sources.