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HIV IN PREGNANCY WITHOUT TREATMENT: EFFECTS ON MOTHER AND CHILD - A CASE REPORT

HIV w Ciąży bez Leczenia: Skutki dla Matki i Dziecka - opis przypadku

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A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

Abstract (in Polish):
HIV – ludzki wirus niedoboru odporności stanowi nadal częstą przyczynę zgonu, szczególnie u osób w wieku rozrodczym. W ciągu ostatnich dziesięciu lat obserwowany jest znaczący wzrost wskaźników ciąż wśród kobiet zakażonych tym wirusem. Pomimo długoletnich badań, wciąż brakuje skutecznej terapii dla kobiet pragnących mieć potomstwo i żyjących z tym wirusem. Na przestrzeni lat zmieniły się zarówno generacje testów na obecność HIV, jak również ich zastosowania. Obecnie rutynowe badanie na HIV jest wykonywane u każdej ciężarnej podczas pierwszej wizyty u ginekologa. Celem tego

przesiewowego badania jest wczesne wykrycie infekcji HIV u ciężarnej, aby możliwie szybko wdrożyć odpowiednią terapię. Głównym zadaniem terapii w ciąży jest zmniejszenie ryzyka transmisji wirusa HIV na rozwijający się płód. Celem pracy był opis przypadku zakażenia HIV u nieleczonej kobiety w ciąży, wraz z omówieniem postępowania terapeutycznego, które miało na celu minimalizację ryzyka przeniesienia wirusa na dziecko.

Abstract (in English):
HIV - human immunodeficiency virus is still a common cause of death, especially in people of childbearing age. Over the past ten years, there has been a significant increase in pregnancy rates among women infected with this virus. Despite many years of research, there is still no effective therapy for women who want to have children and live with this virus. Over the years, both the generations of HIV tests and their applications have changed. Currently, a routine HIV test is performed on every pregnant woman during her first visit to the gynecologist. The purpose of this screening test is to detect HIV infection in a pregnant woman at an early stage in order to implement appropriate treatment as soon as possible. The main goal of therapy during pregnancy is to reduce the risk of HIV transmission to the developing fetus. The article is a case report of HIV-positive pregnant woman.

Keywords (in Polish): HIV, ciąża, terapia antyretrowirusowa.

Keywords (in English): HIV, pregnancy, antiretroviral therapy.

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Introduction

HIV is the well-known human immunodeficiency virus. Despite numerous studies, there is still no effective therapy that would condition the complete cure of HIV/AIDS. Combination antiretroviral therapy only reduces the titer of antibodies to an undetectable minimum, but discontinuation of treatment leads to an increase in viral load [1]. There are several types of tests performed for HIV infection that can measure the level of antibodies, p24 protein or CD4 cells. During pregnancy, HIV testing is performed twice – in the first and third trimesters. The aim is to implement an appropriate management protocol and refer the patient to a center with an appropriate reference level [2]. The number of pregnant HIV-positive patients is constantly growing - in the years 2010-2017 it increased more than twice [3]. Research on the occurrence of HIV during pregnancy is controversial. With the increase in the popularity of risky sexual behaviours and the openness of society to topics related to sexuality, they are less and less taboo. Recently, research on HIV-positive pregnant women has become a popular field. This is influenced by increased awareness of the effects of HIV in pregnancy, new methods of therapy, and the desire to protect offspring from the effects of infection [4].

Treatment of HIV infection requires the administration of strictly defined doses of antiretroviral drugs. Both the list of preparations and the details of their administration have been defined by the Recommendations of the Panel of Experts of the Polish Gynecological Society in the field of preventing perinatal HIV transmission [5].

Effective therapy requires maintaining the appropriate concentration of antiretroviral drugs, which gives a 98% chance of giving birth to a healthy child by HIV-infected women. To be successful, several conditions must be met. First, a woman must be fully aware of her HIV infection to ensure access to appropriate medical care and support throughout the procreation process. Secondly, every woman planning pregnancy or who is pregnant should be tested for the presence of anti-HIV antibodies at the beginning of pregnancy and another test in the third trimester of pregnancy, which allows early detection of infection and implementation of appropriate measures. To deliver a healthy baby, an HIV-positive patient should continue antiretroviral therapy during pregnancy and delivery. Additionally, after birth, antiretroviral drugs should be given to the newborn for the first 6 weeks of life to reduce the risk of virus transmission. In Poland, about 86% of children are infected with HIV during pregnancy, childbirth or breastfeeding. Therefore, the key role in this group of pregnant women is to ensure appropriate prophylaxis and antiretroviral treatment to reduce the risk of transmission of the virus to the child and enable the birth of healthy offspring. By implementing these steps, there is a real chance of minimizing mother-to-child transmission of HIV and improving the quality of life for parents and their offspring[6]. Therefore, the key role in this group of pregnant women is to ensure appropriate prophylaxis and antiretroviral treatment to reduce the risk of transmission of the virus to the child and enable the birth of healthy offspring. By implementing these steps, there is a real chance of minimizing mother-to-child transmission of HIV and improving the quality of life for parents and their offspring [6].

During pregnancy, a woman's body undergoes many physiological changes that affect the pharmacokinetics of drugs, it is caused by e.g.: changes in gastric pH, plasma protein concentration and intestinal peristalsis. For HIV-infected women, it is essential that they are under the care of a gynecologist and specialist of antiretroviral (ARV) therapy. Depending on the patient's clinical

condition and possible concomitant diseases, pregnancy in an HIV-infected woman may end in natural delivery or the need to perform a caesarean section. There is a 70% risk of infection of the baby at birth, and during pregnancy, where it is estimated at 30%. Most factors affecting the risk of infection during delivery are related to the mother's viral load, which is the amount of HIV in her bloodstream. An additional factor is the contact of the baby with the mother's blood and discharge from the birth canal during childbirth. Due to the above risks and the complexity of the situation, appropriate medical care during pregnancy, labour and the postpartum period is crucial in minimizing the risk of infection of the child and ensuring the health of both the mother and her offspring [7].

Antiretroviral therapy during pregnancy is individualized for each patient to achieve viral load (<50 or 40 RNA/HIV copies) at 36 weeks of gestation. The choice of time and type of therapy depends on the clinical condition of the patient. The pregnant woman must be aware of the potential adverse effects of drugs on the fetus and the need to maintain the effectiveness of treatment. During pregnancy, the effectiveness of the treatment is monitored and the fixed regimen of antiretroviral therapy that the patient receives is not changed. In the case of pregnant women with a low viral load, at the limit of detection, i.e. 50 RNA/HIV copies, physiological delivery is preferred. In this case, pharmacological prophylaxis is used, minimizing the number of procedures associated with episiotomy, use of vacuum extraction or forceps. If the viral load at 36 weeks of gestation is unknown or exceeds 50 copies, caesarean delivery is recommended to reduce the risk of vertical transmission of HIV to the baby.

Immediately after birth, the newborn should be thoroughly washed to remove the elements of the vernix from the skin, and wipe the places stained with blood with a disinfectant. It is necessary to aspirate amniotic fluid from the upper respiratory tract. If HIV infection in a pregnant woman is diagnosed after delivery, treatment of the newborn should be started within 72 hours, while still in the hospital, before the age of 3 months.

Women infected with HIV are advised to avoid breast-feeding completely to minimize the risk of transmission of the virus to the baby. The child is discharged from the hospital when the viral load (the presence of the virus in the blood) drops and the percentage of CD4 lymphocytes increases, which is an indicator of improved health. The whole procedure is aimed at reducing the risk of HIV transmission to the baby and ensuring appropriate medical care for both mother and newborn. For HIV-positive children, there is a specially developed vaccination schedule, due to the fact that they have a weakened immune system and cannot receive live vaccines. The entire process is designed to protect the health of your HIV-infected child through appropriate vaccinations and HIV screening to ensure the best possible quality of life and health in the future.

Objective of the work

The aim of the article is to describe the case of a pregnant woman who was HIV positive and did not undergo antiretroviral treatment during pregnancy. The article discusses detailed aspects of the woman's health, the results of laboratory tests, the course of pregnancy and the results of neonatal monitoring. Through the analysis of this case, we try to identify the potential risks and consequences of not taking antiretroviral treatment during pregnancy and understand the impact of this condition on the health of the mother and child.

A case report

A 39-year-old female patient infected with HIV, negative for hepatitis C virus, Vth pregnancy IIIrd delivery in the 37th week, reported to the Obstetrics Ward due to the onset of labor. Due to the positive HIV test result in the patient and the lack of previous antiretroviral treatment during pregnancy, it was decided to perform a caesarean section. Perinatally, the patient received 1 dose of Retrovir. In laboratory tests, an increased number of leukocytes (WBC - leukocytes) of 17.6 10^9/L and anemia (Hb - hemoglobin) 9.2 g/dL as well as hyponatremia (low sodium concentration in the blood) were observed. Blood pressure remained within the reference range. On the first day of hospitalization in the maternity ward, the patient received: Retrovir (antiretroviral preparation), Ascofer (iron preparation), Biofazolin (preparation supporting immunity), Fraxiparine (anticoagulant), Metoclopramide (antiemetic) and Bromergon (preparation regulating the secretion of prolactin). Twenty-four hours after cesarean delivery, the patient was transferred to an infectious diseases ward with an appropriate level of reference for the care of HIV-positive patients for continued treatment.

The patient's pregnancy was abnormal. In the ninth week of pregnancy, during routine laboratory tests, she tested positive for HIV. Despite this result, the patient refused to start antiretroviral treatment. In the tenth week of pregnancy, the patient developed an infection of the upper respiratory tract, which was treated with antibiotic therapy, Ospamox 1000 twice a day for 7 days. Despite the recommended diagnostics, the patient did not perform prenatal examinations of the first and second trimester. In the 28th week of pregnancy, anemia was diagnosed, but even in this case the patient decided not to treat anemia, despite the recommendations of the attending physician.

The course of pregnancy in the case of this patient was burdened with many abnormalities that could have had a negative impact on the health of the eggs and the health of the child. Failure to start antiretroviral treatment after a positive HIV test result, refusal to perform the recommended prenatal diagnosis and untreated anemia posed a serious risk to the health of the mother and the newborn.

By caesarean section, the patient gave birth to a live female fetus in good general condition, body weight: 2990 g, body length 48 cm, Apgar score 10/10. In the first hour after delivery, the newborn was started antiretroviral treatment according to scheme III and vaccinated against hepatitis B [5]. On the second day, a systolic murmur was heard over the heart along the first intercostal space, without signs of circulatory failure. Laboratory tests in the following days without abnormalities Transfontanelle USG performed on the second day showed asymmetry of the lateral ventricles and a septum pellucidum cyst. Abdominal ultrasonography normal image of the abdominal organs. The child was discharged home on the fifth day in good general condition with a recommendation to continue antiretroviral treatment (Retrovir 12mg every 12h, Epivir 6mg every 12h, Viramune 6mg every 24h for 2 days and then every 12h). The mother received information on feeding, supplementation with vitamin D3 and screening tests. The child was referred to the Pediatric Infectious Diseases Clinic and further check-up at the Neonatal Pathology Clinic.

Discussion

HIV, or human immunodeficiency virus, is an increasingly diagnosed disease both in the general population and in pregnant women. More than 25% of infected people remain unaware of their immune status. In the United States alone, the number of people infected with HIV exceeds one million. There are many factors contributing to the increase in incidence, and better access to drugs translates into improved survival of HIV-positive patients.

Confirmation of the diagnosis of HIV infection requires diagnostic tests, which are based on the detection of anti-HIV antibodies or the virus itself in patients' blood samples. Their high quality and availability allows for earlier detection of infection and diagnosis of HIV in a larger population. The increase in survival of HIV-positive patients is mainly related to advances in antiretroviral therapy, which enables effective control of viral replication in the body. Modern antiretroviral drugs inhibit the multiplication of HIV by blocking key stages in the virus's life cycle, which results in lowering the level of virions in the blood and improving the function of the immune system. As therapy is effective, HIV-infected patients are able to maintain their virological status at undetectable levels, which translates into increased survival time and improved quality of life. The introduction of an early treatment strategy, i.e. starting antiretroviral therapy as soon as possible after the diagnosis of infection, contributes to improving the health of patients and reducing the risk of transmitting the virus to others. Improved access to antiretroviral therapy results from various factors, including the development of pharmacotherapy, investment in research, and efforts to provide financial and logistical support to HIV-infected patients. It is important to educate the public about HIV, prevention and the importance of regular diagnostic tests, which may contribute to reducing the number of people who remain unaware of their immune status [8]. Significant changes in the demographics of HIV infection have been observed in recent years. Among newly-diagnosed patients, women are becoming the dominant group, which is a significant deviation from previous trends. This change is the result of a variety of factors, including changes in sexual behaviour and improvements in diagnostic methods and targeted educational campaigns.

The history of HIV transmission has also evolved over the years. In the past, especially at the beginning of the epidemic, injecting drug use was one of the main routes of transmission. Injecting users had a higher risk of infection from sharing contaminated needles or injection equipment. Thanks to greater awareness and taking measures to limit the spread of the disease in this group, the risk of infection has been reduced here. However, over time, the frequency of HIV infection resulting from sexual contact has increased. If you do not have protection during sexual intercourse with someone who is HIV-infected or of unknown serological condition, the risk of transmission of the virus is significantly increased. This makes it necessary to promote education in safe sex practices, regular diagnostic tests and access to contraceptives, including condoms. Extensive educational campaigns should be undertaken to increase public awareness of HIV/AIDS and access to free and confidential diagnostic tests [9].

In addition to the above-mentioned risk factors, low socio-economic status and lack/insufficient education in the field of safe sexual behavior are classified as a factor. They are characteristic especially among citizens of third world countries, hence the occurrence of AIDS and HIV infections are definitely more frequent in these countries. Being in prisons and related behaviors, as well as getting tattoos in unauthorized places are also mentioned as a risk factor[10].

In summary, the rising prevalence of HIV and the increasing number of infected people who remain unaware of their status pose significant public health challenges. In order to prevent the spread of this disease, further efforts are needed to focus on the prevention, diagnosis and treatment of HIV infection. Investment in research and therapeutic innovation should continue to improve existing treatments and develop new pharmacotherapy strategies. Effective prevention, including educating the public about HIV and promoting safe sexual behaviours, is a key element in reducing the number of new cases of infection. [11]. Improving the availability of diagnostic tests and early detection of infections are important in identifying patients requiring medical intervention [1,5,11].

The increased risk of HIV infection in pregnant women results from a variety of biological and hormonal factors that affect the microbiological and physiological conditions of the vagina. Changes in the biocenosis and pH of the vagina may affect the protective capacity of the mucosa and may favor the transmission of the virus during sexual intercourse. In addition, hormonal changes during pregnancy can affect the functioning of the immune system, which can reduce the body's ability to fight infections, including HIV [1,5].

Research shows that immune behaviour changes during pregnancy, which may affect the risk of HIV infection. The body's immune response may be weakened to avoid fetal rejection, which may increase the body's susceptibility to infections, including HIV. Although there are theoretical grounds for an increased risk of HIV infection during pregnancy, it is worth emphasizing that the safety of patients and their children can be effectively ensured by appropriate prophylaxis, diagnostics and treatment. Research into the variability of the vaginal microbiome and immune mechanisms during pregnancy is important to further understand this issue and develop appropriate strategies to prevent HIV infection in pregnant women [6-13].

Regarding HIV diagnosis, there has been a major revolution in the field since the identification of the virus in the 1980s. Currently, HIV diagnostic tests are not only a standard during blood transfusions, but also commonly used screening tests, including among pregnant women. Each subsequent generation of tests had increased sensitivity and specificity, which reduced the risk of diagnostic errors. Modern tests allow for the detection of HIV infection even in its early stages, which enables appropriate medical and therapeutic measures to be taken faster [7-10].

In conclusion, studies on HIV infection in pregnant women show associations with various biological, hormonal and immunological factors. Appropriate preventive and diagnostic activities are crucial to protect the health of the mother and child. Advances in HIV diagnostics have contributed to the introduction of effective and routine screening tests, making it possible to detect infections earlier and provide appropriate medical care [12].

By emphasizing rapid HIV testing in patients who have not previously undergone screening, PTGiP aims to increase awareness and understanding of the importance of early detection of HIV infection in pregnant women and taking appropriate steps to ensure effective medical care for both mother and her child. [5].

Work by Steele demonstrated the importance of HIV diagnosis during pregnancy. The study presents three cases of women who tested negative for routine HIV testing in early pregnancy. After giving birth, it turned out that the serological status of these women was positive for HIV. Surprisingly, two children born to these mothers also tested positive for HIV. This finding underscores the importance of HIV re-testing of pregnant women later in pregnancy, even if previous tests have been negative. The Steele study and similar cases confirm that HIV re-screening in pregnancy is

a key diagnostic tool. which can help prevent vertical transmission of HIV to the child and ensure adequate medical care for the mother and her offspring [13].

Choosing the right time to start antiretroviral therapy is a difficult task, especially for pregnant patients. Pregnancy introduces additional challenges and specific aspects that influence treatment decisions. Unfortunately, there are few studies directly focusing on the optimal time to start antiretroviral therapy during this period. The ideal research model should compare patients who started treatment at different stages. Such research is burdened with a number of limitations and is difficult to conduct due to ethical and practical aspects [10-14].

Therefore, the treatment of pregnant HIV-infected patients is based mainly on the results of studies conducted in non-pregnant patients. Available data and therapeutic recommendations for HIV-infected adults are applicable to pregnant patients, but they must be adapted to the specifics of pregnancy to ensure the best outcomes for both the mother and the developing fetus [7,14].

Conclusions:

1. Pregnant women with HIV infection should receive antiviral treatment from the time of diagnosis to ensure the health of mother and baby.
2. Antiviral treatment aims to protect infected pregnant women against opportunistic diseases and to prolong the life of patients.
3. Making the correct diagnosis and implementing an appropriate treatment process in HIV-positive patients is a priority action.
4. The increase in the incidence of HIV and the number of people who do not know about their health condition requires further action in the area of prevention, diagnosis and treatment.
5. Ongoing scientific research and therapeutic innovation are key in the fight to reduce the global burden of HIV/AIDS.

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