Chickenpox in Pregnancy : Case Study

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Abstract: Varicella zoster virus (VZV) is a highly contagious DNA herpes virus transmitted via respiratory droplets, direct contact, or rarely through the air. The primary infection causes a spreading vesicular rash commonly called chickenpox. Chickenpox pregnancy is rare, with 1-6 cases per 10,000 pregnancies. Infection in the mother during pregnancy can have serious impacts on the mother, fetus and newborn. The present study aimed to explain chickenpox in pregnancy. This is a case study that explains chickenpox in pregnancy. A 29 year old woman pregnant with her first child at 4 weeks' gestation, complained of red spots appearing, filled with water and sore since 2 days ago. The examination results showed that the hemoglobin level was 12.7g/dl, leukocytes 8.8 103/uL, platelets, 363 103/Ul, hematocrit 37.5%, clotting time 4, bleeding time 2, and blood glucose at 108 mg/day. Pregnancy causes a relative decrease in cellular immunity. This fact is explained by physiological immunosuppression in pregnancy. Immunosuppression in pregnancy makes the Varicella zoster virus (VZV) susceptible in pregnant women. Varicella zoster virus (VZV) is transmitted through respiratory droplets, direct contact, or rarely through the air. The primary infection causes a spreading vesicular rash. Varicella infection between the 8-20th week of pregnancy, the fetus is at risk of developing congenital varicella syndrome, a rare syndrome associated with many abnormalities (chorioretinitis, congenital cataracts, cerebral cortex atrophy as well as varying degrees of extremity atrophy and skin scarring). Vaccination is a preventive measure for chickenpox and can reduce its severity. Pregnant women need appropriate treatment to prevent morbidity in the mother and defects in the fetus, as well as mortality in the mother and fetus.

1 INTRODUCTION

Chickenpox (or varicella) is a highly contagious infectious disease caused by the varicella-zoster virus (VZV).[1] Varicella zoster virus (VZV) is a highly contagious DNA virus in the herpes family. The disease is transmitted through respiratory droplets and direct personal contact with vesicular fluid. Primary infection is characterized by fever, malaise, and a pruritic rash that develops into maculopapular clusters that become vesicular and occur before resolution. The incubation period lasts 10 to 21 days, and the disease is contagious 48 hours before the rash appears and continues to be contagious until the blisters appear. After primary infection, the virus may remain dormant in the sensory nerve root ganglia. Still, it may be reactivated, causing a vesicular erythematous skin rash in a dermatomal distribution known as herpes zoster.[2]

In 2014, the World Health Organization (WHO) announced that there were approximately 140.0 million cases of varicella as a global disease burden each year with 4.2 million serious complications leading to hospitalization and 4200 deaths.[3] This disease is spread throughout the world and is usually not dangerous, but in some groups of people, such as pregnant women, this disease can have severe impacts. Little data is available regarding the risk of infection in this condition, the incidence of chickenpox can range between 1.5 to 4.6 cases/1,000 fertile women and 1.21 to 6 cases/10,000 pregnant women, respectively.3 Pregnancy causes a relative decrease in cellular immunity. This fact is explained by physiological immunosuppression in pregnancy, especially in the third trimesters and postpartum.[4]

Pregnant women who have chickenpox have a 10-20% chance of developing VZV pneumonia. Pneumonia may be more severe in the 3rd trimester due to the effect of the gravitational uterus on respiratory function. Risk factors for varicella

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pneumonitis in pregnancy include smoking, pre-existing respiratory disease, immunosuppression and the presence of more than 100 skin lesions. Varicella encephalitis and hepatitis are rare complications. The mortality rate among pregnant women suffering from severe VZV pneumonia was 40% in the era before antivirals. This figure has now been reduced to 15% with the introduction of Acyclovir and improved healthcare services. Varicella can cause trans-placental infection in the fetus. The effect on the fetus depends on the gestational age at which primary infection occurs.[5]

2 CASE ILUSTRATION

A 29-year-old woman, four weeks pregnant with her first child, came to the hospital with complaints of red and sore spots starting two days ago. The patient never had chickenpox vaccination. There are no family members with chickenpox. However, in the patient's environment, there is one neighbor of the patient who is experiencing chicken pox. The physical examination showed that the general condition and vital signs were within normal limits. The study showed red spots filled with water in groups on the buttocks, groin, and thighs. A laboratory examination was conducted, and the hemoglobin level was 12.7g/dl, leukocytes 8.8 103/uL, platelets, 363 103/Ul, hematocrit 37.5%, clotting time 4, bleeding time 2, and blood glucose at 108 mg/day.

3 DISCUSSION

The varicella-zoster virus spreads through respiratory transmission or contact with infectious lesions. Given the high secondary attack rate of 90%, seronegative close contacts are highly susceptible to primary infection.[6] The risk of primary VZV infection in pregnant women is closely related to the prevalence of seronegative adults in the population and the circulating spread of the virus in childhood. It is well known that the epidemiology of chickenpox shows differences between the world's high and low-income regions. In high-income countries, VZV infection was usually acquired in childhood before the implementation of infant vaccination programs. Hence, the prevalence of protective antibodies (anti-VZV IgG) was very high in adulthood, exceeding 95%. In contrast to low-income countries, infection occurs more frequently in adulthood, and most women who give birth are at risk of infection during pregnancy.[7] In this case, it was discovered that the patient had never received a chickenpox vaccination, so she was susceptible to being exposed to VZV during pregnancy.

During pregnancy, there is physiological immunosuppression in pregnancy.[4] The immune response by the mother's immune system is limited to allow the fetus to survive. Changes in the immune response during pregnancy cause an increased risk of hidden infections or new infections. This is due to high levels of estrogen which disrupts the mother's cellular immunity.[8] Immunosuppression during pregnancy is physiological so that the fertilized egg, which later becomes a fetus, is not rejected because its genetic makeup (50% of each parent) is incompatible with that of the mother.[9]

Primary VZV infection in the first trimester does not increase the risk of miscarriage. However, it is very rare for Fetal Varicella Syndrome (FVS) to occur after more than 20 weeks of gestation and no cases have been reported after more than 28 weeks of gestation. 30% of babies born with FVS will die within the first few months of life. FVS in the first 20 weeks of pregnancy can cause viremia.[5] Cicatricial scarring is typical in dermatomal pattern (70%); Hypoplasia/limb reduction (46-72%); cataract (44-52%) chorioretinitis (microphthalmia; mental retardation- 48–62%) hydrocephalus; Bowel sphincter and bladder sphincter dysfunction (7-24%); Long-term learning difficulties and developmental problems in survivors.[5]

Five weeks after primary infection, a detailed ultrasound examination of the fetus (in the fetus of cell-mediated immunity) is recommended. Prenatal diagnosis at 16−20 weeks or five weeks after infection for further analysis and discussion of treatment of the FVS fetus mainly depends on the results of ultrasound. Women who get chickenpox while pregnant should be referred to a specialist. The main features on ultrasound indicating FVS are limb abnormalities, microcephaly, hydrocephalus, soft tissue calcification, polyhydramnios. Fetal MRI can provide additional information if abnormalities are detected.[5]

Invasive tests such as amniocentesis and cordocentesis to test for VZV DNA can be relied upon to determine in-utero varicella infection in the fetus. However, this test has very low specificity for detecting FVS and is not routinely recommended in clinical settings. Congenitally infected fetuses with no anatomical abnormalities of varicella have a good prognosis with neurological development and the outcome is usually good. These babies are at higher

risk of developing Herpes zoster in early infancy and usually do not experience complications.[5]

Varicella in pregnancy poses several challenges. Avoiding exposure to varicella is difficult because the contagious period begins several days before the characteristic rash appears. Second, the treatment of choice varicella immunoglobulin (VZIg) is not widely available in India and most developing countries. Finally, fetal anomaly risk assessment includes fetal blood or amniotic fluid studies and advanced sonological studies, which require adequate expertise and infrastructure.[10]

4 CONCLUSIONS

It is very necessary to carry out smallpox vaccination screening, which is one of the most effective ways to prevent and reduce maternal and fetal morbidity and mortality. Pregnant women who are exposed to chickenpox are at risk of increasing the incidence of congenital defects in their fetuses.

REFERENCES

1. Lopez A. Varicella; Epidemiology and Prevention of Vaccine-Preventable Diseases 14TH Edition. The Pink Book Home. Published 2021. https://www.cdc.gov/chickenpox/index.html
2. Shrim A, Koren G, Yudin MH, Farine D. Management of Varicella Infection (Chickenpox) in Pregnancy. J Obstet Gynaecol Canada. 2018;40(8):e652-e657.
3. States M, Stra- WHO, Group A, Grade T. Varicella and herpes zoster vaccines : WHO position paper , June 2014. WHO. Published 2014. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://iris.who.int/bitstream/handle/10665/242227/WER892 5_265-287.PDF
4. Lourenc AC. Therapeutic approach of leprosy in pregnancy. J Am Acad Dermatol. 2013;68(4):AB125.
5. Nanthakumar MP, Sood A, Ahmed M, Gupta J. Varicella Zoster in pregnancy. Eur J Obstet Gynecol Reprod Biol. 2021;258:283-287.
6. Sivakumar K, Coelho DD, Roy RB. Chickenpox in pregnancy. Br Med J (Clin Res Ed). 1988;296(6625):864.
7. Parente S, Moriello NS, Maraolo AE, Tosone G.anagement of chickenpox in pregnant women: an Italian perspective. Eur J Clin Microbiol Infect Dis. 2018;37(9):1603-1609.
8. Mehta S, Grover A. Infections and Pregnancy.; 2022.
9. Duncan E. Leprosy in Pregnancy. Springer, Milano; 2012.
10. Inbaraj LR, Chandrasingh S, Kumar NA, Suchitra J, Manesh A. High susceptibility to varicella among urban and rural pregnant women in South India: a brief report. Epidemiol Infect. 2021;149
11. Trimawati & Wahid, A. (2018). Studi deskriptif perilaku emotional eating mahasiswa yang mengerjakan skripsi di Universitas Ngusi Waluyo Ungaran. Jurnal SMART Keperawatan ,5(1).