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Case report : abortus with malaria falciparum in pregnancy

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ABSTRACT

Malaria infection is still a global health problem. Malaria can affect all groups including pregnant women. Malaria infection in pregnant women can cause various dangerous complications, one of which is abortion. A 35-year-old pregnant woman was diagnosed with G6P5A0H5 uk 8-9 weeks with falciparum malaria. The patient was given Dihydroartemisin and piperacuine phosphate (DHP) therapy and symptomatic drugs. During observation the patient had no additional complaints and slowly returned to normal. One week later the patient experienced bleeding from the birth canal and was declared an abortion. There are several things that must be considered in the management of malaria in pregnant women such as resources, facilities and infrastructure available at first-level health facilities, and various matters regarding optimal maternal and fetal supervision so as to prevent various complications caused by malaria infection.

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INTRODUCTION

Malaria is an infectious disease that is still one of the world's health problems. Malaria is caused by protozoa of the genus plasmodium spread by infected Anopheles mosquitoes (Sato, 2021). This infection affects all ages, including pregnant women. There are 4 types of plasmodium species, namely plasmodium falciparum, Plasmodium Vivax, Plasmodium Malariae and Plasmodium ovale (Mutmainah et all, 2021). Plasmodium falciparum is a plasmodium that has a severe impact on maternal and fetal morbidity and mortality (Helvacioglu et all, 2022).

Malaria is still one of the public health problems that can cause death, especially in high-risk groups, namely infants, toddlers, and pregnant women. This condition requires us to pay special attention to those patients at high risk. The influence of malaria infection on pregnant women can cause clinical manifestations such as anemia and on the fetus causing premature babies, birth defects, stillbirths, low-weight births or abortions (Ferreira et all, 2022)

In 2010, the World Health Organization (WHO) estimates that 219 million people in the world are infected with malaria and as many as 661,000 of them die each year (George & Lahra, 2022). Indonesia itself has a death rate of around 3,480 people, with most cases caused by Plasmodium Falciparum (Muflikhah & Arianti, 2021). Annual Parasite Incidence (API) above the national average are West Nusa Tenggara, Maluku, North Maluku, Central Kalimantan, Bangka Belitung, Riau Islands, Bengkulu, Jambi, Central Sulawesi, Gorontolo, and Aceh (Datu, 2019). Based

on the 2022 Integrated Management Chart for Sick Toddlers, the working area of the Kawal Health Center states that Kawal is a malaria endemic area (MTBS), 2022).

The management of malaria infection in pregnant women has several challenges because it has side effects on both the mother and the fetus. The use of drugs that are supposed to be the first line in malaria infection in pregnancy often cannot be administered due to the limited facilities and infrastructure that exist in the first level of health facilities. Various efforts continue to be made to prevent complications due to malaria infection in the mother and fetus. Based on this, the author is interested in writing a report on cases of malaria infection in this pregnancy.

RESEARCH METHOD

Anamnesis

A 35-year-old woman came to the health center with the main complaint of fever that felt increasingly aggravating since the last 3 days. Complaints of fever are accompanied by chills and sweating since 3 days before going to the health center. In addition, patients also complain of headaches, nausea, vomiting, heartburn, body aches, diarrhea. When examined, the patient is pregnant with HPHT February 10, 2022, the gestational age is 8-9 weeks. The presence of contractions in the abdomen and blood discharge by the patient. This is the sixth pregnancy for the patient. Previous birth history 5 times through normal delivery. The patient has no history of contraceptive use. The patient also has no history of allergies and asthma or other diseases.

The patient had previously received an anti-malarial drug, DHP. Then when the gestational age is 9-10 weeks, the patient experiences complaints of bleeding from the birth canal so that the patient goes to the emergency room of the hospital and is declared to have a miscarriage.

Physical Examination

The patient appears moderately ill, mentis compost awareness, blood pressure 118/79 mmHg, pulse rate 105 x/min, breath rate 18-22 x/min, saturation 98% temperature 37.3 O C. BB before pregnancy 43 kg, BB while pregnant 43.9 kg. Height 151 cm. The examination in the head and neck section appears normal, the JVP does not increase. The sound of the heart is normal, there are no gallops and murmurs. The sound of right and left vesicular breathing, neither ronkhi nor wheezing sounded. Abdominal examination is also within normal limits. Extremity appears normal and there is no edema in both limbs. Obstetric examination is still in accordance with the gestational age.

Supporting Examination:

The blood examination of the patient when new arrivals can be seen in table 1.

Table 1. Examination of the patient's blood upon arrival

Examination	14/04/2022
Hb	12,2
GDS	100
HIV	Non Reactive
HbSAg	Non Reactive
Malaria	Malaria Falciparum (+)

Based on these data established a working diagnosis: G6P5A0H5 uk 9-10 weeks + Malaria falciparum.

Outpatient observation

The patient gets DHP medication when he goes home. Patients take DHP medication as much as 3 tablets in 3 days. Additionally administered symptomatic drugs such as paracetamol. During the observation the patient showed a good response and no additional complaints. The patient has bleeding from the birth canal after 1 week later. At that time the patient did not experience abdominal pain, the patient was taken to the Hospital and declared abortus.

RESULTS AND DISCUSSIONS

In this case we will discuss the condition of patients who experience complications of malaria infection in pregnancy. The patient was a 35-year-old woman, gravida 8-9 weeks infected with falciparum malaria and had an abortus. Malaria is a disease caused by infection with protozoa of the genus Plasmodium that is transmitted through infected female Anopheles mosquitoes . Common symptoms that appear can include fever loss, headache, muscle aches, chills and sweating. Malaria infection can affect all individuals including pregnant women (Ilyas & Serly, 2021).

The pathogenesis of malaria begins with the entry of sporozoites into the human body through mosquito bites (Tan et all, 2021). Within a few moments, sporozoites get into the parenchymal cells of the liver and grow into schizons, then develop into merozoites (Lukuhay, 2019). Liver cells containing parasites rupture and merozoites exit freely and enter red blood cells. After that a tropozoite is formed that develops into a schizon and continues to divide until the red blood cells rupture (Laurens, 2020). The fever that appears in malaria infection arises along with the rupture of the blood schizon which secretes a wide variety of antigens (Tintó-Font & Cortés, 2022). These antigens will stimulate macrophage cells and a wide variety of cytokines such as Tumor Necrosis Factor (TNF) and Interleukin-6 (IL-6) (Aramita et all, 2020). The cytokine will be carried by the bloodstream to the temperature control center, namely in the hypothalamus so that fever symptoms appear. In falciparum malaria, it takes 36-48 hours, because each plasmodium takes a different time (Elmasari, 2019).

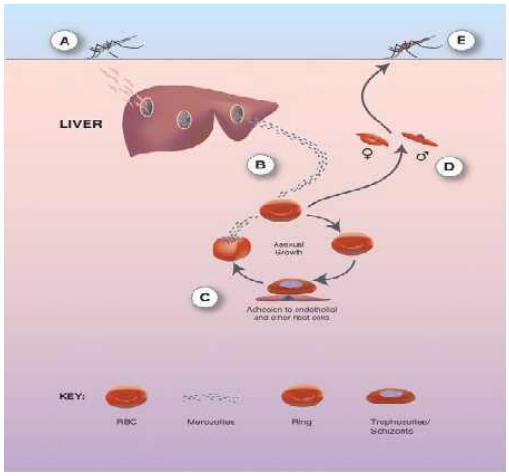

Figure 1. Life cycle of Plasmodium falciparum2

Pregnant women with malaria infection develop antibodies that inhibit the binding of infected erythrosis in Chondroitin Sulfate A (CSA). These antibodies are associated with protection against malaria infection of the placenta. Mothers with primigravida have a higher risk than multigravida. This is due to the fact that antibodies obtained by multigravida mothers cause a reduction in the number of infected erythrocytes (Sari & Hendrawai, 2020). The placenta found in pregnant women has isolates that are antigenic and functionally different. In microvasculars there is a CD-36 receptor and in the placenta there is a CSA receptor). During pregnancy, the mother produces antibodies to the surface of the infected erythrocytes so that it can block the binding process of infected erythrocytes to the placenta. This reduces severity in subsequent pregnancies (Costa et al., 2006)

Malaria infection can result in a wide variety of side effects to pregnancy and the fetus. In pregnancy malaria can result in fever, anemia, hypoglycemia, acute pulmonary edema, kidney failure and can even cause death. In the fetus causes such as abortus, premature labor, low birth weight and fetal death (Zhao & Zhou, 2020).This mechanism is not yet fully understood but there are several theories that explain it (Ngai et al., 2020). The placenta is a multifunctional organ that acts

as a protector for the fetus, producing hormones and growth factors that are important for pregnancy and as a place of exchange of nutrients and oxygen between the mother and fetus (Jaremek et all, 2021). The formation of a healthy placenta occurs due to the balance between proangiogenic and antiangiogenic factors such as (Rahyani et all, 2020) (Ngai et al., 2020)Vascular Endothelial Growth Factor (VEGF) and Placental growth factor (PlGF). In malaria infection, there is an imbalance between these two factors due to the immune system response. The immune system activated through parasite pathogen associated molecular patterns (PAMPs) causes dysregulation between inflammatory reactions and angiogenesis reactions resulting in vascular insufficiency of the placenta which affects the fetus. (Ngai et al., 2020)

Anemia is a common condition in pregnant women due to the hemoconcentration process. This results in anemia in pregnant women (Puspita et all, 2021). In malaria infection, anemia is also a symptom that is often encountered (Awoke & Arota, 2019). The mechanism of occurrence of anemia includes the cleaning or destruction of infected blood cells (Aisah, 2022). Clearance of uninfected red blood cells and the occurrence of erythropotic dupresion and dysentopois. In general, during malaria infection there is a digestion of infected blood cells and uninfected red blood cells in the spleen (Osii, 2022). In Plasmodium falciparum, this type of parasite infects all types of red blood cells, so it can occur in both account and chronic infections (Khowawisetsut et all, 2023). In addition, pregnant women infected with malaria also secrete various kinds of pro-inflammatory or anti-inflammatory cytokines, one of which is Interleukin-10. High levels of IL-10 can also cause anemia in the mother (Okorie, 2019). Anemia in mothers associated with placental malaria correlates with the accumulation of pigment monocytes and macrophages in the placenta (Rustamadji et all, 2021). Oxidative stress produces high levels of TNF-α which causes changes in the erythrocyte membrane leading to the destruction of erythrocytes, as well as suppressing erythropoidis, resulting in anemia in the mother (Susilawati et all, 2023).

The management given is by administering Dihydroartemycin and piperakuin phosphate (DHP). Some studies explain that DHP is a suitable therapy given to patients with malaria infection without complications in pregnancy. This is due to the high resistance of the drug to other anti-malarial drugs such as chloroquine, amodiaquine, and sulfadoxine-pyrimethamine (Widyawaruyanti, 2022). In falciparum malaria infection first trimester the recommended drugs are quinine and clindamycin. However, in some areas there is no clindamycin, so quinine is only given as monotherapy (Saito, 2022). In Indonesia, the use of DHP is the first line in patients with malaria infection in pregnancy. Some studies mention that the use of DHP in pregnancy can reduce side effects in the mother and fetus (Astuti, 2019).

Fetal development in the womb is divided into 3 stages. The first stage of the period of the fetus undergoes organogenesis, the second stage of the fetus undergoes growth and the third stage is the fetal stage characterized by rapid growth of the body and the refinement of the organ systems. During malaria-infected pregnancies the occurrence of perinatal mortality rates is higher in babies born with IUGR (Hasnindar et all, 2023). During malaria infection, in the placenta there is secretion of pro-inflammatory cytokines such as TNF-α that are consistently associated with the fetus so that it experiences low birth weight, both through mechanisms associated with the accumulation of monocytes in the placenta and through premature birth (Seitz et all, 2019). The occurrence of spontaneous abortions is associated with high levels of pro-inflammatory cytokines such as TNF-α in the malaria-infected placenta (Sánchez & Spencer, 2022). Tumor necrosis factor α causes necrosis in the fetus and increases the risk of uterine contractions, resulting in the fetus having an abortion (Anggara, 2021).

CONCLUSION

Malaria infection in pregnancy is a major problem that occurs in various regions, especially in areas endemic to malaria. This infection should be watched out for because it can cause various side effects to the mother and fetus.In pregnant women with malaria infection, complex immune system activity

occurs so that it can cause various complications including abortus events. The mechanism of occurrence is still not known for certain but many theories explain this. Optimal management is needed for pregnant women in malaria management to prevent various complications that will be caused. This is still a record especially for malaria endemic areas that have limited resources.

There are several steps that can be taken to prevent malaria infection in pregnancy and prevent abortion including Early Screening and Treatment: Regular antenatal check-ups and early treatment of malaria cases will help reduce the risk of malaria infection in pregnancy and prevent abortion. Use of Mosquito Nets: The use of mosquito nets while sleeping is very important to protect oneself from mosquitoes carrying malaria parasites. Mosquito nets should be properly fitted and checked regularly to ensure there are no holes that could allow mosquitoes to enter. Prevention of Mosquito Bites: Prevention of mosquito bites through the use of anti-mosquito medication, wearing clothes that cover the whole body, and avoiding outdoor activities at times that are vulnerable to mosquito bites. Taking Malaria Preventive Medicine: Taking malaria preventive medicine prescribed by a doctor can help prevent malaria infection in pregnancy. Boost Immune System: Boosting the immune system through healthy eating, regular exercise, and avoiding stress can also help prevent malaria infection in pregnancy. Health Education: Health education aimed at pregnant women and the general public can help raise awareness of the risks of malaria in pregnancy and how to prevent it.

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