

Preeclampsia in Multiples: A Comparative Case Study on Dichorionic-Diamniotic Twin Pregnancy

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ABSTRACT

Keywords: Preeclampsia; Multiple pregnancies have a 2-3 times greater risk of developing preeclampsia and have a significant long-term effect on both mothers and babies. The underlying cause of preeclampsia in women with multiple pregnancies is higher demand on the cardiovascular system, increased exposure of the chorionic villi, increased antiangiogenic substances compared to angiogenic substances, and placental hypoperfusion. The condition of preeclampsia can worsen quickly, and without warning signs, it must be detected and managed appropriately; if the treatment is late, this condition can lead to eclampsia. The patient was referred with severe preeclampsia and multiple pregnancies with complaints of irregular contraction (+), a history of dizziness (-), nausea (-), vomiting (-), blurred vision (-), and breathlessness (-). Physical examination showed Blood pressure 188/125 mmHg with laboratory findings of proteinuria +3. Cesarean section and IUD insertion were performed. During and after surgery, there were no complications.



Introduction

Preeclampsia is a hypertensive disease during pregnancy that occurs after 20 weeks of gestation and is characterized by an increase in blood pressure (>140/90 mmHg) accompanied by proteinuria (0.3 grams/day or >+1) in women whose blood pressure is normal at gestational age before 20 weeks. Preeclampsia is not only limited to hypertension but can be accompanied by manifestations of damage to other organs, such as the kidneys, liver, lungs, and brain (Thakur, Tayade, Patel, Gupta, & Batra, 2024).

In Indonesia, data collection on preeclampsia, especially at the national level, is still limited. In the Indonesia Maternal Mortality Ratio (MMR) for the period 2008 to 2012, there were 359 deaths per 100,000 live births, with the incidence of preeclampsia in Indonesia as much as 3-10% of all pregnancies (Warouw, 2016). In Indonesia, the maternal mortality rate in 2016 is still high, namely 305/100,000 live deliveries. This is very far from the target of sustainable development goals (SDGs) in 2015, a maternal mortality rate of 102/per 100,000 live births (Ertiana & Wulan, 2019). Maternal Mortality

Rate (MMR) indicates the degree of women's health. MMR is also one of the goals in the Sustainable Development Goals (SDGs), which is contained in goal 3.1 by 2030, namely reducing MMR to less than 70 per 100,000 live births (Marlina, 2022).

Although knowledge of clinical symptoms, diagnostic criteria, and management of preeclampsia has been sought in-depth to date, the underlying causes of preeclampsia still need to be understood. A currently widely accepted hypothesis based on the theory of abnormal placentation causing maternal physiological dysfunction (Driul, 2023).

In the 2019 National Institute for Health and Care Excellence (NICE) Guidelines, a woman is categorized as at high risk of preeclampsia if she has a history of hypertension in previous pregnancies or inherited diseases such as chronic kidney disease, autoimmune, diabetes, or chronic hypertension (Parikh et al., 2017). Women are categorized as medium risk if they are nullipara, aged >40 years, have a body mass index of >35 kg/m², have a family history of preeclampsia, multiple pregnancies, or pregnancy intervals of more than ten years (Fox, Kitt, Leeson, Aye, & Lewandowski, 2019). Risk factors for preeclampsia are as follows (Konar, 2018).

1. Primigravida
2. Family history of hypertension and preeclampsia
3. Disorders of the placenta, such as hyperplacentosis in twin pregnancies, diabetes, and placental ischemic
4. Obesity: BMI >35 kg/m² leading to insulin resistance
5. Have a history of vascular disorders

An additional risk factor that affects the incidence of preeclampsia is that mothers with multiple pregnancies are 3-4x more likely to develop PE. This is due to an increase in the workload of the cardiovascular system, which causes an increase in cardiac output and vascular resistance (Bergman et al., 2020).

Method

Metode yang digunakan adalah case report

Results and Discussion

Hypertensive disease due to pregnancy is more likely to occur in multiple fetuses. The exact incidence associated with twin gestation is challenging to know because twin pregnancies are more likely to be born less than months before preeclampsia can occur and because women with twin pregnancies are often older and multiparous. For example, the incidence of pregnancy-related hypertension in women with multiple pregnancies is 20 percent.

Santema et al. conducted a case-control study with 187 twin and 187 single pregnancies matched for maternal age, parity, and gestational age at birth. The incidence of hypertension was significantly higher in women carrying twins-15 versus 6 percent. Mastrobattista et al. compared 53 triplet pregnancies with 53 twin pregnancies and observed that the rate of severe preeclampsia was significantly higher in women with triplet-23 versus 6 percent. These data suggest that fetal number and placental mass play

a role in the pathogenesis of preeclampsia. In multifetal gestation, hypertension not only arises more often but also tends to appear earlier and more severely.

The management plan carried out is blood pressure regulation, seizure prevention, and termination of pregnancy. Termination of pregnancy is carried out by cesarean section and IUD insertion without complications. After surgery, cesarean section treatment is carried out in the usual room and observation.

This is in line with the results of research from (Monteiro et al., 2021), which states there is a difference in the incidence of preeclampsia in Gemelli's pregnancy and singleton pregnancy, namely 13% of the incidence of preeclampsia in Gemelli's pregnancy and 7% of the incidence of preeclampsia in singleton pregnancies and with an odds ratio of 3x. Gemelli's pregnancy is thought to be able to trigger severe preeclampsia because it causes hyperplacentosis. Hyperplacentosis is believed to increase antiangiogenic levels circulating in the maternal circulation, affecting the balance of angiogenic and antiangiogenic factors (Nelson, Ogunkua, & Cunningham, 2022).

VEGF is the main angiogenic factor that aids the angiogenesis process and stabilizes the mature endothelium. VEGF works on two receptors, namely VEGF tyrosine kinase and flt-1 receptor. PlGF, which is also an angiogenic factor, helps amplify the performance of VEGF by replacing the VEGF placed on the flt-1 receptor so that VEGF can bind more to the VEGF tyrosine kinase receptor. Soluble flt-1 or sflt-1 is one of the antiangiogenic secreted by the placenta and has antagonistic properties against VEGF and PlGF. When Gemelli pregnancy occurs, the number of angiogenic factors increases and causes an imbalance in the amount of antiangiogenic and angiogenic and causes preeclampsia.

An increase in placental mass also affects the increased need for blood supply demand, causing hypoperfusion and producing oxidative stress (Kiondo et al., 2012). Increased amounts of exposure to chorionic villi can also spur the onset of preeclampsia. In Gemelli pregnancies, the amount of chorionic villi exposure is more significant than in singleton pregnancies (Nelson et al., 2022). In addition, the increasing number of trophoblastic debris and antigens can trigger excessive inflammatory processes and the onset of preeclampsia (Parmadi & Pratama, 2020).

Multigravida pregnancies are thought to develop a protective system against preeclampsia, although, in previous pregnancies, abortions have occurred. For pregnancies five or more, it is believed to be more at risk for preeclampsia compared to multigravida, with several pregnancies 2-4 due to older age factors and suspected to have developed essential hypertension (Kiondo et al., 2012).

Pre-eclampsia is a pregnancy-specific syndrome that occurs after the 20th week of pregnancy in the form of reduced organ perfusion due to vasospasm and endothelial activation. Pre-eclampsia is a particular condition in pregnancy characterized by increased blood pressure (TD) and proteinuria. Pre-eclampsia is a collection of symptoms that arise in pregnant women, childbirth, and the puerperium consisting of the triad: hypertension, proteinuria, and edema. Maternity mothers with Severe pre-eclampsia (PEB) are performed mainly by cesarean section cito. Severe Pre-Eclampsia (PEB) is an

indication of childbirth that is at risk of threatening the lives of mothers and babies. Therefore, maternity mothers who have been diagnosed with Severe Pre-Eclampsia must be immediately carried out by SC for the safety of mother and baby. Close monitoring is needed during and after surgery (Tambuwun, Natalia, & Muharni, 2023).

Conclusion

Hypertensive disease due to pregnancy is more likely to occur in multiple fetuses. The exact incidence associated with twin gestation is challenging to know because twin pregnancies are more likely to be born less than months before preeclampsia can occur and because women with twin pregnancies are often older and multiparous.

An increase in placental mass also affects the increased need for blood supply demand, causing hypoperfusion and producing oxidative stress. Increased amounts of exposure to chorionic villi can also spur the onset of preeclampsia. In Gemelli pregnancies, the amount of chorionic villi exposure is more significant than in singleton pregnancies. In addition, the increasing number of trophoblastic debris and antigens can trigger excessive inflammatory processes and the onset of preeclampsia. Multiple pregnancies are at risk of causing PEB.

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