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SEVERE PREECLAMPSIA AND ANEMIA IN PREGNANCY: RISK FACTORS, PREVENTION, AND MANAGEMENT – CASE REPORT

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ABSTRACT
Severe preeclampsia (PE) and anemia are two common medical conditions during pregnancy that have serious impacts on maternal and fetal health. Preeclampsia is a new-onset hypertensive disorder (≥140/90 mmHg) after 20 weeks of gestation, which may be accompanied by proteinuria and organ dysfunction in the mother or uteroplacental dysfunction. If left untreated, preeclampsia can progress to eclampsia, characterized by seizures, neurological disturbances, and anincreased risk of vital organ complications, including kidney failure, pulmonary edema, and liver dysfunction. To report a case of Severe Preeclampsia and Anemia in a 29-year-old female patient. The subject was a 29-year-old G2P1A0 woman in her final trimester of pregnancy who came with the chief complaint of tightness in the abdomen, cramp-like pain, headache, and blurred vision. The patient previously had a history of uncomplicated pregnancy. A 29-year-old G2P1A0 woman presented with complaints of abdominal tightening, cramping, headache, and blurred vision, who was subsequently diagnosed with severe preeclampsia and anemia. Findings included Anemia, Leukocytosis, and Proteinuria are Present. the patient was hospitalized, underwent a caesarean section, and received appropriate medical management.

Keywords: anemia; pregnancy; severe preeclampsia

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INTRODUCTION

Hypertension in pregnancy includes chronic hypertension, gestational hypertension, preeclampsia /eclampsia, and superimposed preeclampsia on chronic hypertension. According to the American College of Obstetricians and Gynecologists (ACOG), 2020, preeclampsia is a disorder in pregnancy that is associated with new-onset hypertension after 20 weeks of gestation. Preeclampsia is also often accompanied by new-onset proteinuria, but hypertension and other symptoms of preeclampsia can occur without proteinuria. Possible severe preeclampsia: 1) Blood pressure ≥ 160/110 mmHg, 2) Proteinuria 2.0g/24 hours or ≥ 2+ on dipstick examination, 3) Serum creatinine > 1.2 mg/dL, unless previously known to be increased, 4) Platelets < 100,000 µL, 5) Microangiopathic hemolysis – increased HDL, 6) Increased serum transaminase levels – ALT or AST, 7) Persistent headache or other cerebral or visual disturbances 8) Persistent epigastric pain (Obstetrics, 2022)

The Centers for Disease Control and Prevention (CDC, 1989) defines anemia in pregnant women with iron tablet consumption using a cutoff of 11 g/dL in the first and third trimesters of pregnancy, and 10.5 g/dL in the second trimester. The decrease in hemoglobin levels and hematocrit values during pregnancy is caused by increased blood plasma volume compared to red blood cell volume. Anemia in pregnancy can occur due

to acute or chronic loss of red blood cells, increased destruction of red blood cells in the body, decreased production of red blood cells or a combination of several of these processes simultaneously. The causes of anemia in pregnant women are generally divided into acquired and hereditary. The clinical symptoms of anemia in pregnancy are not specific, except in severe anemia. Fatigue is the most common symptom (James, 2021). Patients usually complain of paleness, weakness, headache, palpitations, frequent dizziness, shortness of breath, and irritability. Interestingly, recent studies have shown that there is a complex relationship between anemia and preeclampsia(Vigil-De Gracia et al., 2023). Several studies have indicated that anemia, especially in the first and second trimesters, may be a risk factor for preeclampsia. Conversely, preeclampsia may also worsen maternal hematological status through hemolysis, blood loss, and impaired placental perfusion. This suggests that these two conditions occur together and may also exacerbate each other, creating a complex and dangerous pathophysiological cycle.(Cunningham et al., 2014)

In this case report, the author comprehensively discusses a case of a pregnant woman who experienced severe preeclampsia with anemia, including analysis of risk factors, preventive aspects, and the management approach applied (Rana et al., 2019). This case was presented to contribute to clinical understanding and practical recommendations in dealing with similar conditions, especially in resource-limited settings. The urgency of this discussion is also reinforced by the fact that Indonesia still faces a high maternal mortality rate, with hypertension in pregnancy and anemia as the main causes. Therefore, it is important to evaluate the approaches that have been implemented and explore new evidence-based strategies in dealing with both conditions in an integrated manner. Furthermore, this background also highlights the importance of interdisciplinary collaboration in caring for patients with multiple complications. Not only obstetricians and gynecologists, but also internists, nutritionists, and other health workers must be actively involved to ensure a holistic approach and individualization of care. In this context, the case study that will be presented aims to provide a real illustration of the complexity of managing severe preeclampsia with anemia in pregnancy, and how timely intervention can avoid further complications. By understanding the factors that play a role and reviewing the principles of management based on national and international guidelines, it is hoped that this report can be a reference in clinical practice and education for health workers.

METHOD

This writing is a case report study with a descriptive narrative approach to a pregnant patient with severe preeclampsia accompanied by anemia who was treated at UKI General Hospital. Data were obtained from medical records, laboratory results, clinical observations, and interviews with patients and families. Inclusion criteria included pregnant patients with a diagnosis of severe preeclampsia (based on ACOG criteria) and anemia (Hb <11 g/dL). Data collected included physical examination, blood pressure, complete blood count results, proteinuria, and management given such as antihypertensives, magnesium sulfate, and blood transfusions. Analysis was carried out descriptively with a chronological approach. Data validity was maintained through daily clinical recording by medical personnel and standardized laboratory examinations.

RESULT

Case Detail

A 29-year-old G2P1A0 woman who was 38-39 weeks pregnant came to the UKI Hospital Emergency Room with complaints of frequent cramps and stomach aches that had been coming and going since 10 hours before the hospital. The cramps lasted for about 5 minutes with a gap of about 7 minutes. The stomach aches were still felt when moving or walking. The patient also complained of a stabbing headache since 3 hours before the hospital, accompanied by blurred vision. Nausea (+), vomiting (-), fever (-), vaginal discharge (-), blood mucus (-), watery discharge (-). Urination and defecation were normal. CU: Moderately Sick, Consciousness: Compos mentis, Blood pressure: 161/111 mmHg, Pulse: 91x/minute, Respiratory rate: 20x/minute, Temperature: 36.5^0C, SpO2: 99% at room air. Epigastric tenderness (+). Obstetric Examination Inspection: nipple retraction -/-, mass -/-, breast milk -/- the abdomen appears bulging according to gestational age, striae gravidarum (+), linea nigra (+), cicatrix (+), fluor (-), fluxus (-), Palpation: TFU 36 cm, abdominal circumference 108 cm, Auscultation: DJJ 150x/minute. Leopold Examination, Leopold I: Buttocks, Leopold II: Left Back, Leopold III: Head, Leopold IV: Convergent (not yet in PAP). Internal Examination Inspection: fluoride (-), bleeding from OUE (-), rugae vagina (+), mass (-), portio size 2-3 cm, smooth surface, livide color, OUE closed, tissue (-). Laboratory examination Hb: 10.7 g/dL ↓, Ht: 34%, L: 13.4 thousand/uL ↑, T: 231 thousand/uL, Urine color: yellow, BJ: 1,010, urine pH: 6.5, Protein: +3, Leukocytes: 3-4/lpb, Nitrite: (-), Bilirubin: (-), Acetone: (-), Reduction: (-), Urobilinogen: 0.2, Erythrocytes (-), Epithelium: (-), Bacteria: (-), Cylinders: (-), Crystals: (-). Last USG examination on 20/02/25 DJJ: (+), BPD: 9.46 cm, AC: 34.52 cm, Gender: Male, TP: March 2, 2025, Impression: G2P1A0 Pregnant 38-39 Weeks + head position.

The patient has no history of hypertension, diabetes mellitus, heart disease, asthma, or allergies. The patient first menstruated at the age of 13, has regular cycles every month, menstruation duration 7 days, and changes pads 4 times. HPHT: May 23, 2024. Married once and has lasted for 5 years. The patient gave birth to her first child by caesarean section in 2020. The patient has no history of using IUD contraception. The diagnosis is G2P1A0 pregnant 38-39 weeks BSC 1x with PEB and Anemia. Management: Preoperatively given IVFD RL 500 ml + 1 amp Protein 16 tpm, MgSO4 40% mg + 10 cc Aquadest, Starxon 1gr IV, Paracetamol 1x1 gr IV, Nifedipine 2x10 mg PO. Post management operatives were given IVFD RL 500 ml + MgSO4 gr / 6 hour, Straxon 2x1 gr IV, Tofodex 3x1 amp IV, PCT drip 2x1 IV, Nifedipine 2x10 mg PO, Sedofren 3x500 mg PO, Mefinter 3x500 mg PO, Oxytocin 2x1 amp IV, Fetik Suppository 3x1, Lavit C 1x1 amp IV, Inbion 1x1 caps PO, Vit A 1x200 thousand ui PO, Moloco 3x1 tab PO, Canna Plus 1x1 caps PO, Dulcolax supplement extra. Postoperative care evaluation after a cesarean section was performed on February 21, 2025, at 00.00. The patient's results were obtained: The patient complained of pain in the surgical scar, blood seepage on the underpad (+). Consciousness: compos mentis, Blood pressure: 136/78 mmHg, Pulse: 70x/minute, Respiratory rate: 21x/minute, Temperature: 36.6ºC, SpO2: 99% using a 3lpm nasal cannula. Strong uterine contractions (+), the uterine fundus is palpable 1 finger below the umbilicus.

The first day of treatment evaluation was conducted on February 22, 2025, at 06.30. The results obtained were that the patient complained of pain in the surgical scar with a VAS of 7. Nausea (-), vomiting (-). The patient has flatus but has not had a bowel movement. A catheter was installed with 3 urine bags this morning of 50 cc. Consciousness: compos mentis, Blood pressure: 132/80 mmHg, Pulse: 73x/minute, Respiratory rate: 20x/minute, Temperature: 36.5ºC, SpO2: 99% using a nasal cannula 3 lpm. External genitalia examination: lochia rubra (+). Uterine examination: Strong uterine contractions (+), Fundus uteri palpable 1 finger below the umbilicus. The second day of treatment evaluation was conducted on February 23, 2025, at 06.30. The patient's results were obtained. This morning, the patient felt that the pain

in the stitches had begun to decrease. Nausea (-), vomiting (-), breast milk (-). The patient previously had a urinary catheter with a urine bag content of 400 cc; this morning, the urinary catheter is no longer installed. The patient has not had a bowel movement since February 21, 2025 (2 days ago), but has passed wind since yesterday. This morning, the patient was able to walk. Consciousness: compos mentis, Blood pressure: 128/69 mmHg, Pulse: 91x/minute, Respiratory rate: 20x/minute, Temperature: 36.6ºC, SpO2: 98% in room air. External genitalia examination: lochia rubra (+). Uterine examination: Strong uterine contractions (+), uterine fundus palpable 2 fingers below the umbilicus.

DISCUSSION

After anamnesis, physical examination, and supporting examinations, a diagnosis can be made, namely G2P1A0 pregnant 38-39 weeks + BSC 1x + PEB + Anemia. The first PEB diagnosis can be made based on anamnesis, namely the patient has complaints of a headache that feels like being stabbed and the eyes feel dizzy and nauseous without vomiting. Then the patient's blood pressure examination came, namely 161/111 mmHg, edema was found in both of the patient's inferior extremities, when the proteinuria examination was carried out, +3 was found. Headaches can occur due to cerebral autoregulation, where the brain has an autoregulatory mechanism that maintains stable cerebral perfusion, if blood pressure increases above 160/110 mmHg, the mechanism can fail and cause excessive vasodilation or excessive vasoconstriction so that the brain cannot receive it properly and can trigger headaches. Damaged endothelium can cause systemic vasoconstriction, which can increase maternal blood pressure, and increased capillary permeability can also cause edema, especially in the legs. Urinalysis showed protein (+3), indicating large amounts of protein leakage through the kidneys, which is a sign of renal dysfunction due to severe preeclampsia. The patient had previously had a history of cesarean section in 2020 for premature rupture of membranes. Patients with Premature Rupture of Membranes (PROM) often require a Caesarean Section (CS) to prevent serious complications for the mother and fetus. PROM increases the risk of intrauterine infection (chorioamnionitis), fetal distress due to oligohydramnios, and prolonged labor that can cause fetal hypoxia. If the membranes rupture before labor begins, there is an increased risk of bacteria entering the amniotic cavity, which can cause serious infections in the mother and baby, and increase neonatal morbidity and mortality. In addition, oligohydramnios due to rupture of membranes can cause umbilical cord compression, leading to fetal hypoxia. In this case, CS is a safer option than vaginal delivery to reduce the risk of fetal acidosis and hypoxic-ischemic encephalopathy (*Prelabor Rupture of Membranes*, 2025).

Severe preeclampsia (PEB) occurs due to placental implantation disorders, which cause placental hypoperfusion and hypoxia. This condition triggers the release of antiangiogenic factors such as sFlt-1 and endoglin, which inhibit VEGF (Vascular Endothelial Growth Factor) and PlGF (Placental Growth Factor), causing dysfunction of the maternal blood vessel endothelium. As a result, systemic vasoconstriction occurs, which increases blood pressure ≥160/110 mmHg, as well as kidney damage characterized by proteinuria. In addition, activation of the coagulation system can cause microthrombosis, increasing the risk of HELLP syndrome. PEB is also associated with activation of the renin-angiotensin system, which causes sodium and water retention, worsening hypertension and edema. Risk factors that can increase the incidence of PEB include a history of previous preeclampsia, first pregnancy, multiple pregnancies, chronic hypertension, diabetes, obesity, and autoimmune diseases. If not treated quickly, PEB can develop into eclampsia, HELLP syndrome, or multiple organ failure. In this patient's case, a C-section (CS) is highly recommended to reduce the risk of serious complications for the mother and fetus. Severe preeclampsia is a condition that can threaten the lives of the mother and fetus (Rana et al., 2019).

Urine examination results showed proteinuria (+3) due to damage to the renal glomerulus caused by endothelial dysfunction and severe hypertension. This disorder begins with placental hypoperfusion, which triggers the release of antiangiogenic factors (sFlt-1 and endoglin), which inhibit VEGF and PlGF, causing renal endothelial dysfunction. As a result, there is an increase in glomerular capillary permeability, allowing plasma proteins (especially albumin) to leak into the urine. Meanwhile, the diagnosis of anemia is obtained based on laboratory examination results. Anemia in pregnant women can occur due to increased iron requirements, physiological hemodilution, and impaired red blood cell production. During pregnancy, plasma volume increases more than the increase in red blood cell mass, causing hemodilution, which reduces hemoglobin levels even though the total number of red blood cells remains increased. In addition, the need for iron increases to support the formation of maternal red blood cells and fetal development, so pregnant women are susceptible to iron deficiency anemia if intake is sufficient. Other factors, such as impaired iron absorption, chronic bleeding, infection, or chronic disease, can also worsen anemia. In certain conditions, such as preeclampsia or HELLP syndrome, anemia can occur due to hemolysis (rupture of red blood cells) and impaired kidney function, which inhibits the production of erythropoietin, a hormone that stimulates the formation of red blood cells. If iron intake is insufficient, hemoglobin production decreases, causing anemia (Rana et al., 2019)

In this case, the patient underwent a Sectio Caesarea procedure and not a vaginal delivery procedure, because the score obtained for VBAC (Vaginal Birth After Cesarean) was 2, indicating a low probability of VBAC success. The assessment indicators assessed for VBAC itself include: Maternal age <40 years, History of vaginal delivery, Previous CS indications not due to failure of labor progress, Cervical dilation at entry ≥ 4 cm, and Cervical efacement at entry > 75% ("VBAC Risk Score for Successful Vaginal Delivery (Flamm Model)," 2025). The management given to this patient is IVFD RL 500 ml + Protein. Ringer's Lactate (RL) solution is used to provide sufficient fluids for patient hydration before the CS procedure. This infusion helps maintain electrolyte and fluid balance, and prevents hypovolemia (lack of blood volume) during and after surgery. Protein administration is given to prevent sudden hypotension due to the administration of 1 antihypertensive and to control the infusion of Ringer's Lactate or other fluids to maintain fluid and electrolyte balance (Obstetrics, 2022). Patients are also given MgSO4 40% 4 mg + 10 cc IV. Magnesium Sulfate ($MgSO_4$) 40% with a dose of 4 grams is used in patients with Severe Preeclampsia (PEB) to prevent and treat eclampsia seizures, which are dangerous complications of PEB. $MgSO_4$ works as an anticonvulsant by suppressing the activity of the central nervous system, thereby reducing the risk of seizures due to severe hypertension and cerebral vasospasm. In addition, $MgSO_4$ also helps dilate blood vessels in the brain, reduces cerebral vasospasm, and reduces the risk of stroke and cerebral edema (unairnews, 2020).

Given Starxon 1x1 gr IV. Ceftriaxone is a third-generation cephalosporin antibiotic that has a broad spectrum against gram-negative and gram-positive bacteria. Ceftriaxone is used to prevent postoperative infections, especially in major surgical procedures such as cesarean section. Prophylactic antibiotic administration before a CS procedure aims to reduce the risk of surgical wound infection and postpartum infection, which are common complications in patients undergoing cesarean section (Gan et al., 2014). In addition, the patient was given Nifedipine 2x10 mg PO. Nifedipine is an antihypertensive drug from the calcium channel blocker (CCB) class that is used to lower blood pressure in patients with Severe Preeclampsia (PEB). PEB is characterized by severe hypertension (≥160/110 mmHg), proteinuria, and target organ disorders, which can cause serious complications such as stroke, kidney failure, and eclampsia if not treated immediately. Nifedipine works by inhibiting the entry of calcium ions into vascular smooth muscle cells, causing arterial vasodilation, thereby reducing

systemic vascular resistance and blood pressure (Brown et al., 2018) Paracetamol 1x1 gr IV is given. Paracetamol is used as a nonopioid analgesic to reduce postoperative pain. Paracetamol works by inhibiting the enzyme cyclooxygenase (COX) in the central nervous system, thereby reducing the production of prostaglandins responsible for the sensation of pain (Gan et al., 2014).

Next, the patient is given Lavit C 1x1 gr PO. Lavit-C is a supplement that contains Vitamin C and is often used in patients undergoing Section Caesarea (SC) to support the wound healing process and increase the body's immunity. Vitamin C plays an important role in the synthesis of collagen, which is the main component in the tissue healing process after surgery (Carr & Maggini, 2017). In addition, the patient is given Oxytocin 2x10 iu IV. Oxytocin is given to patients undergoing Sectio Caesarea (SC) to stimulate uterine contractions and prevent postpartum hemorrhage (PPH). Oxytocin works by stimulating oxytocin receptors in the myometrium, which increases uterine contractions, helps in the expulsion of the placenta, and closes the uterine blood vessels to prevent excessive bleeding (Milhan et al., 2019). Tofedex 3x1 IV. Tofodex, containing dexketoprofen, is a nonsteroidal anti-inflammatory drug (NSAID) used to treat mild to moderate pain (Sari & Septica, 2023). Given Vit A 1x200 thousand ui PO. Given after Sectio Caesarea (SC) to support wound healing, improve the immune system, and prevent vitamin A deficiency in postpartum mothers. After CS, the body requires an optimal tissue regeneration process, especially in surgical wounds. Vitamin A plays an important role in collagen synthesis and epithelial cell differentiation, thus helping accelerate wound healing and prevent infection (Tanumihardjo et al., 2016). Fetic Supp 3x1 rectal. Fetic Suppositoria. Rectal is used after Sectio Caesarea (SC) as an analgesic to reduce postoperative pain and inflammation (MacDermott, 2007) Sedofren 3x500 mg PO.

Prophylactic antibiotic administration such as cefadroxyl aims to reduce the risk of infection, either during labor or after delivery. Infection of the urinary tract, soft tissue, or postoperative infection (such as sectio caesarea). Therefore, cefadroxyl is given to avoid complications of infection after the procedure or in the postpartum period (Rahma & Mualifah, 2023; Suciawati & Nuryani, 2021). Patients are also given Mefinter 3x500 mg PO.Works as a nonsteroidal anti-inflammatory drug (NSAID) which is used to reduce pain and inflammation. Mefenamic acid is given to treat pain associated with labor conditions, such as contraction pain or postoperative pain after sectio caesarea. In addition, mefenamic acid can help reduce inflammation in injured tissue and speed up the recovery process (Rahma & Mualifah, 2023). Patients are also given Inbion 1x1 caps PO. Helps wound healing, increases red blood cell production, and speeds up post-operative recovery. Inbion is a supplement containing zinc, vitamins, and minerals, which play an important role in tissue regeneration and the immune system. In anemia patients, especially due to blood loss during childbirth, the iron, folic acid, and vitamin B12 content in Inbion helps increase red blood cell and hemoglobin production, thereby accelerating energy recovery and preventing complications due to oxygen deficiency in the body (Dewi & Nindya, 2017).

Given Moloco 3x1 tab PO. Moloco 3x1 tab PO is given as a supplement that contains bovine placenta extract and vitamin B12 vitamins, minerals, and other important elements to support the health of the mother and fetus during pregnancy and the post-partum recovery process. Giving Moloco aims to provide additional nutrition needed by mothers after a cesarean section, ensure that the mother gets enough nutrients for optimal recovery, and is claimed to increase breast milk production. To help the recovery process, Canna plus 1x1 caps PO is given. Canna plus 1x1 PO is a supplement derived from snakehead fish, which contains high protein (albumin). This supplement usually contains ingredients that help the body's recovery process after giving birth and increase stamina (Bharucha et al., 2013) The patient also

complained of not being able to defecate so he was given Dulcolax supp extra. Dulcolax stimulates bowel movements and overcomes constipation. After CS, many patients experience constipation due to side effects of anesthesia, immobilization, and the use of opioids as analgesics. Dulcolax contains. Bisacodyl, a stimulant laxative that works by stimulating colonic peristalsis and increasing the secretion of water and electrolytes into the intestinal lumen, thus facilitating defecation.

CONCLUSION

Severe preeclampsia and anemia are two very important obstetric complications because they contribute significantly to maternal and fetal morbidity and mortality, especially in developing countries such as Indonesia. In this case report, the patient experienced severe preeclampsia accompanied by moderate anemia, with typical clinical manifestations such as severe hypertension, edema, epigastric pain, and complaints of weakness due to anemia. This case shows a multifactorial relationship between preeclampsia and anemia, where anemia can worsen placental hypoxia that has been disrupted due to preeclampsia, while preeclampsia with endothelial dysfunction can worsen anemia through hemolysis and impaired renal function. Early detection of these two conditions is very important, because late treatment can lead to serious complications such as eclampsia, impaired fetal growth and development, and even maternal and fetal death. Management of severe preeclampsia includes stabilization of blood pressure, prevention of seizures with magnesium sulfate, and termination of pregnancy if the gestational age has reached a viable age or decompensation occurs. Meanwhile, treatment of anemia requires iron supplementation, parenteral therapy, and blood transfusion in certain cases.

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