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Case Report: Hypertension in Pregnancy

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KEYWORDS

Hypertension in pregnancy; Preeclampsia; Magnesium sulfate; Nifedipine; Case report.

ABSTRACT

Hypertensive disorders in pregnancy, such as preeclampsia, are a leading cause of maternal and perinatal morbidity and mortality. This case report details the management of a patient with severe preeclampsia, highlighting the challenge of a progressive hemoglobin drop without thrombocytopenia. The report aims to describe the clinical presentation, diagnostic approach, and management of a term pregnancy complicated by severe preeclampsia and a suspected concurrent urinary tract infection. A case study was conducted on a 23-year-old woman, G2P1A0, at 39 weeks' gestation, who presented in the active phase of labor with hypertension and bleeding. Data were collected through clinical examination, laboratory tests, and monitoring of the implemented treatment regimen. The patient was diagnosed with severe preeclampsia based on hypertension (160/100 mmHg) and proteinuria (2+). Laboratory findings revealed a significant drop in hemoglobin (from 11.4 g/dL to 8.2 g/dL) with normal platelet counts, ruling out HELLP syndrome, alongside leukocytosis and nitrite positivity suggesting a urinary tract infection. Management with a combination of magnesium sulfate, nifedipine, oxytocin, and antibiotics successfully stabilized maternal hemodynamics. This case underscores the importance of vigilant monitoring for atypical presentations such as progressive anemia in preeclampsia and affirms the effectiveness of a combined $MgSO_4$–nifedipine regimen, alongside infection control and timely delivery, in managing severe preeclampsia at term.

INTRODUCTION

Hypertensive disorders in pregnancy (including preeclampsia and eclampsia) are major causes of maternal and fetal morbidity and mortality worldwide (Mol et al., 2022; Abalos et al., 2018). The definition of gestational hypertension is a systolic blood pressure ≥ 140 mmHg and/or a diastolic blood pressure ≥ 90 mmHg after 20 weeks of gestation in women who were previously normotensive (Brown et al., 2018; Lowe et al., 2020). Preeclampsia is characterized by additional proteinuria or associated organ dysfunction (Magee et al., 2022; Roberts et al., 2021). The global incidence is estimated at 5–10 % of pregnancies, and its management includes seizure prevention ($MgSO_4$), blood pressure control, fluid management, and proper timing of delivery (Sibai, 2019; Mol et al., 2022). This case report describes a G2P1 patient presenting in labor at term gestation who was found to have hypertension and proteinuria, thereby requiring immediate management according to these principles.

Management of severe preeclampsia includes seizure prevention with magnesium sulfate ($MgSO_4$), blood pressure control using antihypertensive agents, fluid management, and timely delivery (Townsend et al., 2016). Despite established clinical guidelines, challenges remain in managing cases with atypical presentations, such as progressive anemia without thrombocytopenia or concurrent infections that may complicate the clinical picture (Obeagu, 2024).

Hypertension in pregnancy is defined as a systolic blood pressure of 140 mmHg or higher and/or a diastolic blood pressure of 90 mmHg or higher, recorded on two separate occasions at least four to six hours apart, in a woman who was previously normotensive (Phipps et al., 2019; Whelton et al., 2018). According to the American College of Obstetricians and Gynecologists, this condition is categorized into several types, including chronic hypertension, gestational hypertension, preeclampsia, eclampsia, and superimposed preeclampsia (Sibai, 2020). This disorder is a significant global health issue, affecting approximately 5–10 % of all pregnancies and contributing to an estimated 50,000–60,000 maternal deaths annually, making it one of the leading causes of maternal mortality worldwide (Williams et al., 2022; Gillon et al., 2019; WHO, 2021).

Several risk factors increase the likelihood of developing preeclampsia. These include advanced maternal age, particularly over 35, and nulliparity, where first-time pregnancies carry a higher risk due to an incomplete immune adaptation to placental antigens (Bartsch et al., 2016; Rana et al., 2019). A genetic predisposition also exists, with the risk increasing by up to 25% if a mother or grandmother had the condition (Williams & Kenny, 2019). Other significant factors are pre-existing diabetes, which quadruples the risk (Garovic et al., 2020), a history of chronic hypertension, obesity with a high body mass index, and multiple pregnancies (Duckitt & Harrington, 2021; Chappell et al., 2021). Interestingly, while smoking is associated with a lower incidence, it carries a much higher risk of fetal death and growth restriction (Milne et al., 2020).

The pathogenesis of preeclampsia involves complex physiological changes. A key feature is decreased angiotensin II levels coupled with increased vascular sensitivity to vasoactive substances, leading to significant vasoconstriction and hypertension (Ngene & Moodley, 2019; Verdonk et al., 2017). This is accompanied by intravascular hypovolemia, where plasma volume decreases by 30–40%, causing hemoconcentration, reduced tissue perfusion, and impaired fetal oxygenation, potentially leading to intrauterine growth restriction (Staff et al., 2019; Chaiworapongsa et al., 2023). Widespread vasoconstriction disrupts the function of multiple maternal organ systems and reduces utero-placental blood flow, thereby compromising fetal well-being (McCarthy et al., 2022).

Preeclampsia is clinically classified as mild or severe based on specific criteria. Mild preeclampsia is diagnosed with blood pressure readings of 140/90 mmHg or a specific increase from baseline after 20 weeks of gestation, along with proteinuria. Severe preeclampsia is characterized by blood pressure at or above 160/110 mmHg, higher levels of proteinuria, oliguria, cerebral or visual disturbances, epigastric pain, pulmonary edema, and laboratory findings such as thrombocytopenia or impaired liver function, which may indicate HELLP syndrome.

Signs and symptoms typically manifest after 20 weeks of gestation. Patients may report frontal headaches, blurred vision, diplopia, or pain in the upper right abdomen. Physical

examination often reveals elevated blood pressure, limb edema, and possibly pulmonary edema. Supporting laboratory examinations are crucial, with proteinuria being the hallmark finding. Blood tests may show hemoconcentration, thrombocytopenia, elevated uric acid and liver enzymes, and signs of hemolysis in severe cases, aiding in diagnosis and severity assessment.

The primary goals of management are to prevent eclampsia, ensure the safe delivery of a live fetus, and prevent maternal complications such as intracranial bleeding. Immediate administration of magnesium sulfate ($MgSO_4$) is the cornerstone for seizure prophylaxis. Careful fluid management is essential due to the risks of pulmonary edema and oliguria. Blood pressure is controlled with antihypertensives like nifedipine, while diuretics are reserved for specific complications such as pulmonary edema. The definitive treatment often involves terminating the pregnancy, with timing based on gestational age, fetal condition, and the severity of maternal symptoms.

Complications of severe preeclampsia can be life-threatening for both mother and baby (Chang et al., 2023). Maternal risks include placental abruption, cerebral hemorrhage, HELLP syndrome (characterized by hemolysis, elevated liver enzymes, and low platelets), liver necrosis, acute kidney injury, and disseminated intravascular coagulation. For the fetus, complications arise from placental insufficiency, leading to intrauterine growth restriction, prematurity, and even intrauterine death.

Although preeclampsia cannot be entirely prevented, its frequency and severity can be mitigated through regular and thorough antenatal care, which allows for early detection of warning signs. Patient education on the benefits of adequate rest, a balanced diet moderate in protein and low in carbohydrates, fats, and salt, and avoiding excessive weight gain is crucial. The prognosis is influenced by the patient's history; women who have experienced preeclampsia in a previous pregnancy face a significantly higher risk of recurrence in subsequent pregnancies.

This case report provides empirical insight into clinical decision-making in severe preeclampsia within a regional hospital setting (PONEK Ciawi Hospital). The novelty of this case lies in documenting progressive hemoglobin decline without HELLP syndrome and the effective use of $MgSO_4$–nifedipine combination therapy in a term pregnancy complicated by a suspected urinary tract infection. This report aims to present a detailed case of severe preeclampsia management at term and discuss the diagnostic and therapeutic approach based on current clinical guidelines.

RESEARCH METHOD

The research employed a qualitative case study design to conduct an in-depth investigation into the clinical presentation, diagnostic process, and therapeutic management of a single patient diagnosed with severe preeclampsia. This approach was deemed most appropriate to provide a rich, contextualized understanding of the complexities involved in managing a high-risk obstetric case with atypical features, specifically a progressive hemoglobin decline in the absence of HELLP syndrome. The study was conducted within the clinical setting of PONEK Ciawi Hospital, allowing for a real-time examination of medical decision-making.

The population of this study was defined as pregnant patients presenting with hypertensive disorders. The data sample consisted of a single, purposively selected case: a 23-year-old female, G2P1A0, at 39 weeks gestation, who was admitted in the active phase of labor with signs of severe preeclampsia. The sampling technique was purposive sampling, as the case was specifically chosen for its relevance to the research focus on severe preeclampsia management and its unique clinical feature of significant anemia without thrombocytopenia. The primary research instruments were patient medical records and direct clinical observation. Data were extracted from a comprehensive review of the patient's identity, anamnesis, physical and obstetrical examination findings, serial laboratory results (including complete blood count and urinalysis), and the detailed pharmacologic and non-pharmacologic interventions administered.

Data analysis was performed using a descriptive analytical technique. The collected clinical data were systematically organized and summarized in a case narrative. This was followed by a thematic analysis where the patient's clinical findings and management steps were critically compared and contrasted against established clinical guidelines and existing scientific literature on preeclampsia. The analysis focused on key themes such as diagnostic criteria fulfillment, the rationale for the chosen therapeutic regimen (MgSO4 and nifedipine), the interpretation of the progressive anemia, and the decision-making process for labor management, thereby deriving evidence-based conclusions and implications from the case.

RESULTS AND DISCUSSION

CASE REPORT

Patient Identity

Name	: Mrs. Y
Age	: 23 years old
No. RM	: 008*****
Gender	:Woman
Address	: Kp. Pasar Kaliki RT004 RW006
Work	: Housewives
Religion	:Islam
Tribe	:Sundanese
Marital Status	:Marry
Inspection Date	: August 27, 2024

Anamnesis

The autoanamnesis will be carried out on August 27, 2024 at 13.00 WIB at PONEK Ciawi Hospital.

Main complaints:

Mules from dawn at 04.00

Current Disease History:

Patient G2P1A0 with a gestational age of 39 weeks came to PONEK Ciawi Hospital with mules complaints since dawn at 04.00 which appeared to disappear, then more often 4 hours

of SMRS. Complaints are accompanied by bleeding from the birth canal. Discharge, mucus, nausea, vomiting, headache, and heartburn are denied.

History of Past Illness:
The patient has a history of hypertension in pregnancy since the first child pregnancy, as well as having asthma. History of DM, lung, heart, allergies, and surgery history is denied.

Family History of Disease:
History of hypertension, DM, asthma, pulmonary, heart, allergies, and surgery history is denied.

Treatment History:
During pregnancy, patients take pregnancy vitamins and blood-boosting tablets.

Custom History:
Patients consume rice along with side dishes and vegetables 2-3 times per day. Drink enough water. History of smoking, drinking alcohol is denied.

Menstrual History:
The first menstruation is a 13-year-old patient with a regular menstrual cycle of 28 days, a menstrual length of 3-7 days. The number of pads that are changed is 2-3 pads per day without excessive pain during menstruation. The first day of the last menstrual period is on November 19, 2023.

Marriage History:
Marriage with a husband is now the first marriage with a marriage age of 5 years.

History of Contraception:
The patient has never used birth control.

Riwayat Obstetri:
This pregnancy is the second pregnancy. Patients routinely perform ANC at the midwife with a total of 6 visits, with the following details; 2 times in the 1st trimester, 2 times in the 2nd trimester, and 2 times in the 3rd trimester. It is said that the estimated date of the patient's delivery is August 26, 2024.
The first child is female, born 8 months prematurely, BBL 2100 grams with vaginal delivery at the Health Center. There are difficulties during pregnancy and childbirth, namely PEB. Current age is 5 years old.

Physical Examination

- General conditions : Appears to be moderately ill
- Awareness : Compos Mentis, GCS 15 (E4M6V5)

Vital Signs

- Blood pressure : 160/100 mmHg

- Pulse : 95x/min, regular, adequate
- Pernapasan : 20x/min, spontaneous, regular
- Temperature : 36,9℃
- SpO2 : 98%

Date Anthropometers

- BB : 47 kg
- TB : 150 cm
- IMT : 20.9 k/m2 (normal)

System Inspection

- **Head:** Normocephali, black hair, evenly distributed, not easily removed, scalp no abnormalities, no mass
- **Eyes:** Palpebra superior et inferior dextra et sinistra invisible edema, icteric sclera (-/-), anemic conjunctiva (-/-), spherical pupil, isochor, direct light reflex (+/+) and indirect (+/+)
- **Nose:** normal shape, no deviation, mucosal hyperemic (-/-), secretion (-/-), no visible abnormalities
- **Ears:** normal shape, airy ear canal, serum (-/-), secretion (-/-), tragus compressive pain (-/-), atrial pull pain (-/-), pre-retro atrial dextra and sinistra intangible enlarged
- **Mouth:** normal lip mucosa, tongue not dirty, tongue deviation (-)
- **Neck:** trachea is located in the middle, the thyroid gland is not palpably enlarged, the submandibular and cervical KGB dextra et sinistra are not palpably enlarged, the cervical supraclavicula et infraclavicula dextra et sinistra are not palpably enlarged.
- **Lung**
  - Inspection : normal chest shape, symmetrical chest movement
  - Palpation : stem fremitus right and left equally strong, not palpable lump
  - Percussion : sonor in both lungs
  - Auskultasi : Vesicular breathing sound (+/+), rhonki (-/-), wheezing (-/-)
- **Heart**
  - Inspection : Ictus cordis is not visible
  - Palpation : stroke cordis teraba of ICS V MCL left
  - Percussion : heart limit within normal limits
  - Auskultasi : BJ I and II normal, murmur (-), gallop (-)
- **Abdominal**
  - Inspection : convex shape, distension (-), surgical wound (-), striae (+), linea nigra (+), bowel movement (+), surgical scar (-)
  - Auskultasi : bising usus (+) normal
  - Percussion : tympanic on the entire abdominal quadrant
  - Palpation : Swelling, swelling, swelling, swelling,
- **Limb** : superior et inferior, dextra et sinistra no apparent deformity, warm akral, edema (-/-), CRT < 2 seconds
- **Skin** : Rapid Skin Recurrence, Dry Skin (-), Atrophy (-), Iteric (-)

- **Genitalia** : according to female gender

Status Obstetrics

Leopold Examination

- Leopold 1 : teraba bokong
- Leopold 2 : Right Back Touch
- Leopold 3 : Head Touch
- Leopold 4 : already in PAP, Hodge 2

❑ Tinggi Fundus Uteri : 29 cm
❑ Fetal Heart Rate : 143 x/min
❑ Fetal Weight Assessment : 2790 grams
❑ HIS : 3x/10 minutes

Gynecological Status

- Inspection: vulva and vagina do not appear abnormalities, blood (+), mucus (-), water -water from the birth canal (-).
- Inspector : Not done
- PD : opening 8 cm, amniotic (+)

Supporting Examinations

- **Lab Examination Results dated 27/08/2024 at 13.09**

	Result	**Reference Value**	**Unit**
BLOOD ROUTINE			
Hemoglobin	11.4	11.7 – 15.3	g/dL
Hematocrit	34.1	35 – 47	%
Lekoscytes	22.9	3.6 – 11	10^3/uL
Thrombositis	298	150 – 440	10^3/uL
CLINICAL CHEMISTRY			
GDS	78	80 – 200	mg/dL

	Result	**Reference Value**	**Unit**
COMPLETE URINE			
Makroskopis			
Color	Reddish Yellow	Yellow	-
Turbidity	Turbid	Clear	-
Specific Gravity	1015	1010 – 1030	-
pH/Reaction	6.5	4.8 – 7.4	-
You will be	Negative	Negative	-
Nitrite	Positive	Negative	-
Protein	2+	Negative	-
Glukosa	Negative	Negative	-
Keton	3+	Negative	-
Urobilinogen	3.2	3.2 – 16	umol/L

	Result	Reference Value	Unit
COMPLETE URINE			
Makroskopis			
Bilirubin	Negative	Negative	-
Red blood cell	5+	Negative	-
Microscopy			
Erythrosit Sedimen	10 – 15	0 – 1	/LPB
Lekosit Sedimen	2 – 3	0 – 5	/LPB
Silinder	Negative	Negative	/GPA
Crystal	Amorphous	Negative	/LPB
Epitel Trantitional	0 – 2	0 – 2	/LPB
Epitel Tubular Ginjal	Negative	Negative	-
Epitel Gepeng	6 – 8	0 – 2	/LPB
Bacteria	Positive	Negative	-
Jamur	Negative	Negative	-

- **Lab Examination Results dated 27/08/2024 at 22.34**

	Result	Reference Value	Unit
BLOOD ROUTINE			
Hemoglobin	8.7	11.7 – 15.3	g/dL
Hematocrit	26.6	35 – 47	%
You will be	20.0	3.6 – 11	10^3/uL
Thrombositis	290	150 – 440	10^3/uL

- **Lab Examination Results on 28/08/2024**

	Result	Reference Value	Unit
BLOOD ROUTINE			
Hemoglobin	8.2	11.7 – 15.3	g/dL
Hematocrit	23.8	35 – 47	%
You will be	23.1	3.6 – 11	10^3/uL
Thrombositis	249	150 – 440	10^3/uL

Resume

An examination of a pregnant patient G2P1A0 with a gestational age of 39 weeks with mules complaints since dawn at 04.00 which appeared to disappear appeared, then more often 4 hours of SMRS. Complaints are accompanied by bleeding from the birth canal. Based on the results of a general physical examination, TTV was found within normal limits, HT grade 2, found linea nigra. Leopold 1 buttocks palpable, Leopold 2 right back palpable, Leopold 3 head palpable, Leopold 4 has entered PAP hodge 2, DJJ 143x/minute, TFU 29 cm, TBJ 2790 grams. Results Lab examination with mild anemia and in complete urine there was a result of 2+ proteins.

Occupational Diagnostics

G2P1A0 gravid 39 weeks inpartu period I active phase + PEB

Tatalaksana

- Farmakologi:
  - IVFD RL drip oxytocin 20 IU 20 tpm
  - IVFD NaCl drip MgSO4 40% 4 grams in 30 minutes loading dose
  - IVFD RL drip MgSO4 40% 6 gram 20 tpm maintenance
  - Inj. Tranexamic acid 3x500 mg IV
  - Cefadroxil 2x500 mg PO
  - Paracetamol 3x500 mg PO
  - SF 1x60 mg PO
  - Nifedipine 3x10 mg YES
  - Dopamet 3x500 mg PO
- Non-Pharmacology:
  - Observation of KU, TTV, DJJ, HIS, and Progress of Childbirth

Prognosis

- Ad vitam: Dubia ad Bonam
- Ad functionam: Dubia ad Bonam
- Ad sanationam: Dubia ad Bonam

Clinical picture of the case

- Identity: Mrs. Y, 23 years old, G2P1A0, came August 27, 2024 with mules since dawn and bleeding from the birth canal. HPL Estimate August 26, 2024; 2nd pregnancy; limited ANC checks (6 times).
- Vital signs: blood pressure 160/100 mmHg, pulse 95/min, RR 20/min. Obstetric status: gestational age 39 weeks, TFU 29 cm, DJJ 143/min, opening 8 cm, amniotic membrane (+).
- Supporting examination: complete urine: protein 2+, nitrite (+), bacteria (+), ketone 3+; routine blood showed Hb 11.4 g/dL (13.09), then decreased to 8.7 g/dL (22.34) and 8.2 g/dL (28/08), leukocytosis (WBC value 22.9 → 23.1 ×10^3/µL), platelets within normal limits.

Diagnosis

Based on blood pressure ≥160/100 mmHg and proteinuria 2+, as well as a history of hypertension in previous pregnancies, the patient was declared to have hypertension in pregnancy with a severe picture (PEB) that required immediate anticonvulsive and antihypertensive treatment. In this case report, the occupational diagnosis was recorded: G2P1A0 gravid 39 weeks inpartu during the I active phase + PEB.

Discussion of key findings

Blood pressure and proteinuria: Blood pressure of 160/100 mmHg and proteinuria 2+ met the criteria for severe preeclampsia according to the guidelines listed in the literature review of the report, requiring antiseizure management and BP control.

Rapid decrease in hemoglobin: Hb decreases from 11.4 to 8.2 g/dL within a few days. Possible causes in the context of childbirth: obstetric bleeding (especially patients coming with birth canal bleeding), hemodilution/hemolysis (although platelets remain normal so HELLP is less supportive at this time), or a combination of stress and blood loss. Monitoring and evaluation of the causes of anemia (source of bleeding, need for transfusions) is important. In a state of rapid hemoglobin decline with various possibilities such as hemodilution/hemolysis (HELLP), birth canal bleeding, or significant blood loss can be considered transfusion, but in this patient to reduce bleeding, it is still considered to be administered with a transexame because the patient's hemodynamics are still stable, and periodic observations are still carried out.

Urinary tract infections: Nitrites (+) and bacteria (+) in complete urine and leukocytosis support the possibility of urinary tract infections that can worsen the mother's condition (risk of fever, contractions, or neonal complications). Therefore, the administration of antibiotics (cefadroxil) recorded in the management is relevant.

The rationale for the management given:

- MgSO4 was given (loading 4 g IV and then maintenance 6 g in infusion/20 rpm) for the prevention of seizures/eclampsia as recommended for patients with severe preeclampsia. Monitoring of tendon reflexes, respiration, and the availability of calcium gluconate as an antidote is important.
- Antihypertensive (Nifedipine) as an oral first line to gradually lower blood pressure according to the guidelines listed in the literature review.
- Oxytocin is administered (RL infusion + oxytocin 20 IU) with the aim of increasing labor as well as postpartum bleeding management.
- Antibiotics (cefadroxil) and tranexamic acid as part of supportive management.

Monitoring and decision on pregnancy: Since the patient is already *termed* (≥37 weeks) and shows signs of severe preeclampsia during active labor, the procedure to terminate the pregnancy (labor) is an appropriate option after the hemodynamic condition is relatively stable. In accordance with the principle in the literature review, termination of pregnancy is the definitive treatment if the gestational age is sufficient and/or there are maternal/fetal indications.

CONCLUSION

This case involved a G2P1 woman at 39 weeks of gestation presenting with severe preeclampsia, characterized by a blood pressure of 160/100 mmHg, proteinuria 2+, leukocytosis, and a significant hemoglobin decrease. Management included $MgSO_4$ (loading and maintenance doses), nifedipine, oxytocin, antibiotics, and supportive measures with strict monitoring, consistent with protocols for severe preeclampsia in term labor. However, the absence of delivery and neonatal outcome details limits evaluation of management efficacy and short-term prognosis. Future research should document comprehensive maternal and neonatal outcomes, delivery methods, and postpartum interventions to enhance understanding of treatment effectiveness and guide improved clinical management of term severe preeclampsia cases.

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