

HEMORRHAGIC STROKE IN MULTIGRAVIDA WOMAN WITH SEVERE PREECLAMPSIA: A CASE REPORT

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ABSTRACT-- Hemorrhagic stroke is one of the big problems in pregnancy. When this condition occurs, both the mother and baby are in dangerous conditions and will be a bad outcome. Stroke incidence in pregnancy estimated to reach 4 to 34,2 per 100,000 births and the mortality rate is 1.4 per 100,000 births. Causes of the intracerebral hemorrhage (ICH) including vascular anomalies, severe preeclampsia, eclampsia, and coagulopathy. Provide an overview related to the incidence, comorbidities, and choices and considerations in the management of hemorrhagic strokes in pregnancy. We report a 34 years old multigravida woman 33-34 weeks gestational age with a chief complaint of weakness of right extremities, headache, and slurred speech with high blood pressure and found proteinuria from urinalysis examination. On obstetric ultrasound examination found singleton live head presentation baby according 33-34 weeks gestational age with estimated fetal weight 1860 grams. Head CT scan examination showed small amount of blood filling in frontoparietal left lobe with estimated volume about 21 cc with a conclusion as a subarachnoid hemorrhage (SAH). Patients got early management of preeclampsia until MAP reached, and performed emergency cesarean section to terminated the pregnancy because of the worsening of the mother such as severe headache, nausea and vomitus. Patients and baby were in good condition and discharged after being treated at the NICU and mother plans to physiotherapy after recovery post operation. Spontaneous hemorrhagic stroke will give a high rate of maternal mortality but subarachnoid hemorrhage is a condition that is less common. Preeclampsia is a risk factor and a co-morbid for this condition. The diagnosis and management of hemorrhagic stroke is not much different during pregnancy. Care for mother with spontaneous ICH at the time of termination of pregnancy is very individual. However, what is most important for maternal and fetal care is the optimization of the mother and childbirth for the obstetric indications that are needed. Management in the third trimester of pregnancy must be considered to avoid prematurity as long as the neurological and obstetric status is stable.

Keywords-- Hemorrhagic Stroke, Severe Preeclampsia, Subarachnoid Hemorrhage

I. INTRODUCTION

Stroke is one of the big problems for pregnant women. When this condition occurs, both the mother and baby are in dangerous condition and will be a bad outcome.^{1,2} The incidence of stroke in pregnant women is estimated to reach 4 to 34.2 per 100,000 births, and the mortality rate is 1.4 per 100,000 births.³⁻⁶ Both in ischemic or

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hemorrhagic strokes. . Causes of the intracerebral hemorrhage (ICH) including vascular anomalies, severe preeclampsia, eclampsia, and coagulopathy.^{7,8} Type of ICH which is subarachnoid hemorrhage aneurysm, was found to have a lower risk of incidence during pregnancy, childbirth, or puerperium.⁹

ICH risk factors identified were pain like migraine, gestational hypertension, preeclampsia, thrombocytopenia, thrombophilia, sickle cell disease, systemic lupus erythematosus (SLE), heart disease, postpartum hemorrhage, infection postpartum, and also blood transfusion. Moyamoya's disease and cerebral sinus venous thrombosis are rare causes of stroke in pregnant women. Pathophysiology and etiology of spontaneous ICH are not associated with certain structural abnormalities; this is what distinguishes it from other types of ICH.^{2,5}

Beyond the neurological and neurosurgical aspects, there are several reasons make overall management of pregnancy with a stroke very challenging. First, Regarding the limitations in imaging tests and therapy due to side effects in the unborn baby. Secondly, it is difficult to set a management guideline standard at ICH because of a low incidence. Third, consider the age of the mother and fetus to get the most optimal management. The care status of the mother and fetus must be individual. The risk of prematurity for the fetus must be balanced with management risk if the pregnancy continues.^{10,11} In the absence of specific guidelines and systematic reviews for cases of stroke in pregnancy, we report one case in patients with severe preeclampsia to explore the etiology, management, and effects of spontaneous ICH in pregnant women.

II. CASE REPORT

A 34 years multigravida woman (Gravid 5 Para 3 Abortion 1), a referral from the Regional Hospital with perceived right hemiparesis 1 day before admitted to the hospital. Initially, patients only complained of headaches and tongue slurred so difficult to speaking and the felt right hemiparesis. The history of consciousness is denied. The patient was 8 months of pregnancy equal to 33-34 weeks of gestation. The patient denies contraction, water broke, and vaginal discharge. Patients ANC regularly at the midwife and to obstetrician 1 times and declared the condition was good. The fetal movement was active. The patient has no previous history of high blood pressure.

Patients arrived at the hospital with blood pressure 170/100 mmHg, pulse 84 times/min, body temperature 36,0 C and respiratory rate 20 breaths/min. On physical examination, found motoric strength on the right extremity at the superior extremity was 22222 and inferior 33333. Obstetric examination was performed and the result with in normal limit.

Obstetric ultrasound examination found singleton live head presentation baby according 33-34 weeks gestational age with estimated fetal weight 1860 grams. On laboratory examination, hemoglobin was 13.5 mg/dl, Hematocrit 40%, platelets 283×10^3 cells / μ L, leukocytes 11,300 / μ L , blood gual levels at 88 mg / dl , ureum 26 mg / dL, creatinine 0.72 mg / dL, SGOT 48 mg / dL, SGPT 27 mg / dL, PT 8.9 seconds, APTT 28.8 seconds, LDH 504 U / L, and positive urine protein 3. Head CT scan examination (Fig. 1.) showed small amount of blood filling in frontoparietal left lobe with estimated volume about 21 cc with a conclusion as a subarachnoid hemorrhage (SAH).

From these results then we diagnose with G5P3A1 33-34 weeks gestational age, singleton live head presentation with mother's problems were severe preeclampsia and hemiparesis dextra et causa hemorrhagic stroke et causa subarachnoid hemorrhage.

Patients got early management of preeclampsia which is magnesium sulfate single dose continue maintenance dose intravenous and got nifedipine titration until MAP reached. Emergency cesarean section is performed on patients due to worsening conditions such as the mother's headache, nausea, and vomiting after being stabilized for 6 hours. Born a baby girl weight 1900 grams with Apgar score 8/9 then treated at the Neonatal intensive care unit (NICU).

III. DISCUSSION

Hemorrhagic stroke or intracerebral hemorrhage (ICH) can cause long-term disability or death in pregnancy. In pregnant women with hemorrhagic strokes found 50% are types of Subarachnoid hemorrhage (SAH) and intraparenchymal hemorrhage (IPH).¹² In 100,000 pregnancies there are 10-20 cases of spontaneous SAH but there are unknown numbers of unidentified etiologies and many other types of hemorrhagic strokes caused by anomalous structures such as vascular abnormalities.¹³

Preeclampsia and other pregnancy-related hypertension are common and primary comorbid causes of hemorrhagic strokes and most of the pregnant women are from vascular malformations such as AVM, aneurysm, or moyamoya disease.⁸ As found in our patient, the patient got severe preeclampsia accompanied by hemiparesis dextra complaint that was preceded with headache, slurred speech so difficult to speaking, and the result of head CT scan found subarachnoid hemorrhage.

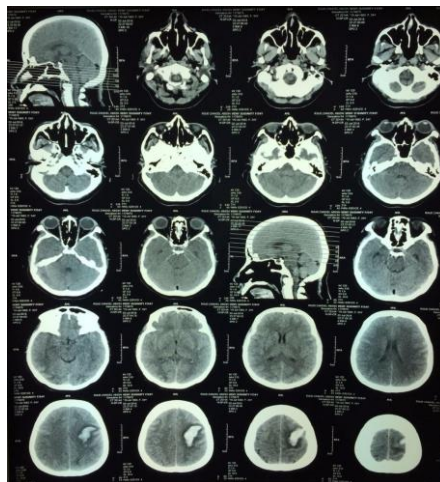


Figure 1: Head CT – scan

The study reported 14% of patients with preeclampsia or eclampsia had hemorrhagic strokes, while other studies found 44% of hemorrhagic strokes with eclampsia in the study group, and other literature found studies related to hemorrhagic strokes used by reversible cerebral vasoconstriction.^{3,14,15}

Other studies report non-structural ICH approved by preeclampsia associated with HELLP in the incidence of IPH and SAH and dissemination of intravascular coagulation with IPH. This finding is similar to the patient we report which also has severe preeclampsia by having a subarachnoid hemorrhage.¹⁶ Physiological differences in pregnant women due to increased total fluid volume, increased cardiac output, vascular remodeling, and hypercoagulation state. Specific factors that must be linked to ICH during pregnancy are preeclampsia/eclampsia,

supportive diseases, hypertension, consumption, haematological changes related to pregnancy, gestational diabetes, and black race. The only risk factor in the patient we report is preeclampsia because the patient has no metabolic history and no hypertension in previous pregnancies.^{12,17}

Pregnancy with hypertension is a major factor in the incidence of ICH where preeclampsia occurs in up to 25-45% of cases. Even so the research that showed pregnant patients with ICH in their study did not contain pregnancy.^{7,10,18}

The results of the Moulin and Cordonnier report found hematoma volume to be a predictor of functional outcome and 30-day survival or mortality in ICH cases, and the location of the hematoma can be used for short-term and long-term prognosis. Other studies have found better results in lobar ICH patients compared to non-lobar ICH patients. But in their research is not including the pregnant women.^{19,20}

A review found that obstetric management in spontaneous ICH patients did not differ significantly from neurosurgery and management of pregnant women with ICH. A multidisciplinary team is needed when involving pregnant women in neurosurgery cases to assess and treat patients; by assessing the clinical nature of the mother, gestational age, and fetal status. Maternal hemodynamics is very important because it is related to fetal status. Head CT examination is performed immediately without delay (there is a minimal risk of fetal developmental disruption given limited radiation exposure) for neurosurgical evaluation to know the management of pregnant patients with potential intracranial hemorrhage. MRI imaging can be used if it is considered beneficial for surgical purposes.^{10,21}

Management of spontaneous ICH in pregnancy is very individual based on maternal status and gestational age. In general, spontaneous ICH treatment does not differ between patients who are pregnant or not. In the case of ICH with pregnancy usually occurs in the third trimester and it is of concern to immediately evaluate and maintain fetal stabilization. Consideration of termination of pregnancy before management of neurosurgery is preferred in the third trimester, but the delay in termination of pregnancy is done in certain cases especially in premature fetuses to reduce the risk of prematurity so that conservative management is chosen ICH.^{10,11} Our patients were terminated immediately by cesarean section due to circumstances mother who is getting worse.

There has been no comparative study of spontaneous ICH management strategies in pregnant women. Therefore expert opinions and a multidisciplinary team are needed for the care of these patients. Previous studies have provided guidance on various management plans according to gestational age, and management of fetal status is primary in the periviable period and needs to be adjusted in detail by the multidisciplinary team with patients.^{10,11} In 2008 there was a study that defined the management of neurosurgery for SAH aneurysm cases in pregnant women. They pointed out that before 26 weeks of pregnancy, ICH management focused on protecting maternal health. After 34 weeks weighing maternal health and termination of fetal pregnancy by cesarean section, and in pregnancies between 26-34 weeks it is very individual.¹³

Neurosurgery research considers that at 28 weeks' gestation is a turning point for neurosurgical intervention. Pregnant patients with acute intracerebral and hemodynamic instability need immediate termination of the cesarean if indicated neurosurgery management is indicated. In certain patients, vaginal delivery with regional anesthesia can be considered to minimize blood loss compared to Caesarean and conservative management options at ICH.²²

In a study found 22 patients who were diagnosed with ICH after 28 weeks of pregnancy, of which 15 cases were conservatively managed and 7 cases were operative. Opinions of other experts say conservative management

remains the first line of treatment in cases of ICH with third trimester pregnancy.¹⁰ SAH conditions in our patients are conservatively managed. One of the conservative management judgment due to bleeding volume of 21 cc according to Recommendations from the American Heart Stroke Association (AHA / ASA) stated that the operative (surgical clipping) in patients with SAH can be considered in patients with intraparenchymal hematoma (50 mL) and cerebral arterial media aneurysms, while endovascular coiling might increase consideration in patients over 70 years, who have a bad degree subarachnoid bleeding aneurysms (World Federation of Neurological Surgeons classification class IV or V), and in those with aneurysms from the basilar apex.²³

IV. CONCLUSION

Spontaneous hemorrhagic stroke will give a high rate of maternal mortality with SAH being one of the less common types. Diagnosis and treatment are not much different during pregnancy. Management of pregnant women with spontaneous ICH must be individualized; however, the most important is optimizing maternal and fetal care and childbirth for the necessary obstetric indications. As long as the neurological and obstetric conditions are stable, the management of pregnancy in the third trimester can be considered to reduce the risk of extreme prematurity in the fetus.

REFERENCES

1. Hatano S. Experience from a multicentre stroke register: a preliminary report. *Bull World Health Organ.* 1976;54(5):541.
2. Fairhall JM, Stoodley MA. Intracranial haemorrhage in pregnancy. *Obstet Med.* 2009;2(4):142–8.
3. Kittner SJ, Stern BJ, Feeser BR, Hebel JR, Nagey DA, Buchholz DW, et al. Pregnancy and the risk of stroke. *N Engl J Med.* 1996;335(11):768–74.
4. Jaigobin C, Silver FL. Stroke and pregnancy. *Stroke.* 2000;31(12):2948–51.
5. James AH, Bushnell CD, Jamison MG, Myers ER. Incidence and risk factors for stroke in pregnancy and the puerperium. *Obstet Gynecol.* 2005;106(3):509–16.
6. Lanska DJ, Kryscio RJ. Risk factors for peripartum and postpartum stroke and intracranial venous thrombosis. *Stroke.* 2000;31(6):1274–82.
7. Moatti Z, Gupta M, Yadava R, Thamban S. A review of stroke and pregnancy: incidence, management and prevention. *Eur J Obstet Gynecol Reprod Biol.* 2014;181:20–7.
8. Liang C, Chang S, Lai S, Hsieh C, Chueh H, Lee T. Stroke complicating pregnancy and the puerperium. *Eur J Neurol.* 2006;13(11):1256–60.
9. Algra AM, Klijn CJM, Helmerhorst FM, Algra A, Rinkel GJE. Female risk factors for subarachnoid hemorrhage A systematic review. *Neurology.* 2012;WNL-0b013e31826aace6.
10. Ascanio LC, Maragos GA, Young BC, Boone MD, Kasper EM. Spontaneous Intracranial Hemorrhage in Pregnancy: A Systematic Review of the Literature. *Neurocrit Care [Internet].* Februari 2018; Tersedia pada: <https://doi.org/10.1007/s12028-018-0501-4>
11. Arachchilage DJ, O'Brien P, Davie C, Cohen H. Systemic Thromboembolism in Pregnancy: Cerebrovascular Disease. In: Cohen H, O'Brien P, editor. *Disorders of Thrombosis and Hemostasis in Pregnancy: A Guide to Management [Internet].* Cham: Springer International Publishing; 2015. hal. 105–

24. Tersedia pada: https://doi.org/10.1007/978-3-319-15120-5_6
12. Leffert LR, Clancy CR, Bateman BT, Cox M, Schulte PJ, Smith EE, et al. Patient characteristics and outcomes after hemorrhagic stroke in pregnancy. *Circ Cardiovasc Qual Outcomes*. 2015;8(6_suppl_3):S170–8.
 13. Ng J, Kitchen N. Neurosurgery and pregnancy. *J Neurol Neurosurg Psychiatry*. 2008;79(7):745–52.
 14. Sharshar T, Lamy C, Mas JL. Incidence and causes of strokes associated with pregnancy and puerperium: a study in public hospitals of Ile de France. *Stroke*. 1995;26(6):930–6.
 15. Albano B, Del Sette M, Roccatagliata L, Gandolfo C, Primavera A. Cortical subarachnoid hemorrhage associated with reversible cerebral vasoconstriction syndrome after elective triplet cesarean delivery. *Neurol Sci*. 2011;32(3):497–501.
 16. Block HS. Neurological complications of pregnancy. *Curr Neurol Neurosci Rep*. 2016;16(7):67.
 17. Miller EC, Yaghi S, Boehme AK, Willey JZ, Elkind MS V, Marshall RS. Mechanisms and outcomes of stroke during pregnancy and the postpartum period A cross-sectional study. *Neurol Clin Pract*. 2016;6(1):29–39.
 18. Lin L-T, Tsui K-H, Cheng J-T, Cheng J-S, Huang W-C, Liou W-S, et al. Increased risk of intracranial hemorrhage in patients with pregnancy-induced hypertension: a nationwide population-based retrospective cohort study. *Medicine (Baltimore)*. 2016;95(20).
 19. Moulin S, Cordonnier C. Prognosis and outcome of intracerebral haemorrhage. In: *New Insights in Intracerebral Hemorrhage*. Karger Publishers; 2016. hal. 182–92.
 20. Samarasekera N, Fonville A, Lerpiniere C, Farrall AJ, Wardlaw JM, White PM, et al. Influence of intracerebral hemorrhage location on incidence, characteristics, and outcome: population-based study. *Stroke*. 2015;46(2):361–8.
 21. American College of Obstetricians and Gynecologists, Committee on Obstetric Practice. Committee Opinion No. 656: Guidelines for Diagnostic Imaging During Pregnancy and Lactation. *Obstet Gynecol*. 2016;127(2):e75.
 22. Yoshitani K, Onishi Y. Anesthetic management of pregnant women with stroke. In: *Neuroanesthesia and Cerebrospinal Protection*. Springer; 2015. hal. 473–80.