SPMRJ Vol. 7 No 2, August 2025 DOI: 10.20473/spmrj.v7i2.56155

SINTA 2 (Decree No: 177/E/KPT/2024) Available online at https://e-journal.unair.ac.id/SPMRJ

Case Report

Physical Medicine and Rehabilitation Role of Complete Recovery after Intracerebral Hemorrhage in Eclampsia with HELLP Syndrome: A Rare Case

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Article info:

Received: March 20, 2024

Received in revised: March 3, 2025

Accepted: April 16, 2025

Published: August 25, 2025

Cite this as: Tambunan, et. al. Physical Medicine and Rehabilitation Role of Complete Recovery after Intracerebral Hemorrhage in Eclampsia with HELLP Syndrome: A Rare Case. Surabaya Physical Medicine and Rehabilitation Journal Vol. 7 No. 2. 219-228. https://e-journal.unair.ac.id/SPMRJ/article/view/56155.

Abstract

Cerebrovascular accident during hypertensive disorder of pregnancy is a rare condition, but carries high risk of mortality and morbidity due to its unpredictable onset. Intracerebral Hemo rrhage (ICH) associated with eclampsia is responsible for 5–12% of maternal deaths during pregnancy. Eclampsia is defined as a convulsive episode occurring in the setting of preeclampsia. The hallmark presentation of eclampsia is characterized with generalized tonic-clonic seizures which typically lasted 60 to 90 second in duration, might be preceded with headaches, visual disturbance, abdominal pain, and increased blood pressure. HELLP syndrome frequently associated with severe preeclampsia-eclampsia and is characterized by three hallmark features of hemolysis, elevated liver enzymes, and low platelets. Here, we report an unusual case of 25-year-old primigravida with 38 weeks gestation, which developed sudden eclampsia and intracranial hemorrhage. A night before admission, she complained about headache and had projectile vomit in the morning that followed by generalized seizure. She had no history of seizure or high blood pressure during her antenatal care. Laboratory test shows elevated liver enzyme and low platelets count and CT-scan which showed hemorrhage in left intraparenchymal lobes. She was successfully managed by multidisciplinary approach including emergency cesarean section, conservative neurological treatment for intraventricular hemorrhage and rehabilitation ever since in intensive care unit until discharge from ward. Rehabilitation approach in eclampsia with superimposed intraparenchymal hemorrhages could start safely as early as possible by collaboration with other departments. This can help mother achieved independency of activity daily living and improvement of cardiorespiratory endurance as before.

Keywords: *primigravida, eclampsia, cerebrovascular, HELLP, rehabilitation*

INTRODUCTION

Eclampsia is one of the most common risk factors for cerebrovascular accident in pregnancy. Intracerebral hemorrhage is an infrequent entity, with incidence ranges from 1 in 15000 deliveries. Patient with Intracerebral hemorrhage mostly from age group of 20-50 years.[1] The hallmark presentation of eclampsia is characterized with generalized tonic-clonic seizures which typically lasted 60 to 90 second in duration, might be preceded with headaches, visual disturbance, abdominal pain, and increased blood pressure.[2] Vomiting, altered level of consciousness, and recurrent seizures in eclampsia might be superimposed with intracerebral hemorrhage, that can be proven with brain CT-scan or MRI. Worsening condition requires emergent cesarean section. Complications that can be related to this condition include acute respiratory distress syndrome, infection, and HELLP syndrome.[3]

Rehabilitation in pregnancy have a role in maintaining healthy pregnancy. Some recommendation from literatures suggested safe physical activities such as walking, stationary bike, aerobic, swimming, resistance training or stretching. Literature suggested moderate physical exercise for 150-300 minutes per week with 20-30 minutes per session.

Physical exercise in pregnancy can prevent gestational hypertension, gestational diabetes, preeclampsia, pain, and depression.[4]

This case illustrates rehabilitation involvement in multidisciplinary team for management of eclamptic patient with intracerebral hemorrhage from intensive care unit to successfully discharge with her role function as a mother without neurological deficit.

CASE REPORT

A 25-year-old female at 38 weeks of gestational age was referred to the

emergency room due to recurrent convulsion, unconsciousness and high blood pressure that was diagnosed with eclampsia. The night before, she complained about headache and had projectile vomit in the morning that followed by generalized seizure. This was her first pregnancy with no history of previous miscarriages. History of high blood pressure, diabetes, heart disease, anemia, accidents, allergies, menstrual disorders, seizures, and other chronic diseases before the pregnancy and during her antenatal care were denied. Familial history of any metabolic diseases and convulsions were also denied. The patient worked as a housewife at the time of admission.

The patient had emergency caesarean surgery, and after delivery the blood pressure was consistently high. There was also no improvement in her consciousness. She received MgSO4 1mg/hour intravenously to treat the eclampsia. The laboratory results show low platelet count 53.000/ml, elevated liver enzymes, ALT 596, AST 169, LDH 2760, and positive 3 albuminuria that confirm for HELLP syndrome. Immediately after the delivery, she had brain CT-scan which showed hemorrhage in left intraparenchymal lobes about 2,8 ml and right parietal lobes can be seen in Figure 1. She received conservative treatment for the hemorrhages with nicardipine and mannitol intravenous for lowering blood pressure and intracranial pressure.

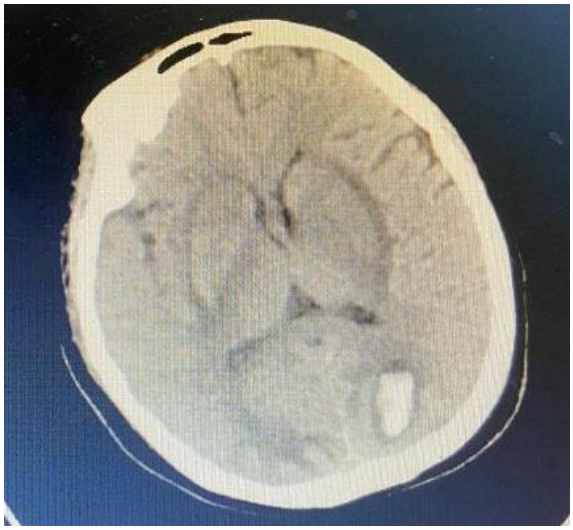

Figure 1. Brain C0,5T-scan

The rehabilitation started in post operative day three. Patient still combative (RASS +2 with positive CAM ICU) and mechanically ventilated with SIMV mode and FiO2 40%. The mean arterial pressure (MAP) was 130-140. The heart rate is 110-120 times/minute with high respiratory frequency 24-28x/minute with phlegm in the bilateral

lungs that confirm respiratory distress condition. The cough reflex is present but inadequate to mobilize the sputum. The rehabilitation program were airway clearance and safe mobilization. The passive mobilization starts by gradually positioned patient in erect sitting while closely monitor the blood pressure to keep the MAP below 120. Chest therapy and mechanical insufflation and exsufflation once a day was used to clear the sputum retention when patient still not cooperative to do breathing exercise.

On the third day rehabilitation, there was improvement in consciousness RASS -1 and negative CAM ICU. The mechanical ventilation mode was shifted to CPAP. There was functional movement of bilateral upper and lower extremity. The patient then was given active in bed manual leg cycle for 10-20 minutes/ day. On the fourth day, she was extubated, and the RASS was zero. The airway clearance program was shifted to breathing exercise that consist airway clearance breathing technique (ACBT) with huffing, diaphragmatic breathing and chest mobility three times a day for five repetitions. She was transferred to wards on the next day, the blood pressure also starts to decrease. The rehabilitation programs were continued in ward with focused in improvement in activity daily living and endurance, for preparing her role as a mother to carrying and breast feeding the baby. Her mobility was well improved that the patient could stand and walk besides the bed. Before discharge, six minutes walking test (6MWT) was performed with the distance is 40 meters, with VO2max 8,2 ml/kg/minute and 2,3 METs. The patient was prescribed home program consist of low to moderate aerobic exercise for three to five days/weeks, can be seen in Table 1, and continuing breathing exercise. Three days after discharged, patients reported that she could hold and breastfeed the baby in sitting position as seen in Figure 2.

Table 1. Aerobic-exercise prescription

Frequency	3-5 times per weeks
Intensity	30-50% HRR or RPE 10-13
Time	Started with 10 minutes, progression to 30-60 minutes per session
Type	Low impact, such as static cycling and walking

Figure 2. Three days after discharge

DISCUSSION

Eclampsia is defined as a convulsive episode or altered level of consciousness occurring in the setting of preeclampsia, if there is no other cause of seizures. The diagnostic criteria of preeclampsia include (1) systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg on two occasions at least 4 hours apart and (2) proteinuria ≥300 mg/day in a woman with a gestational age of >20 weeks with previously normal blood pressures.[6]

Mortality and Morbidity rates in pregnant women with pre-eclampsia and eclampsia around 5-10%, and fetal mortality is around 40% in developing country. Common cause of maternal death with pre-eclampsia and eclampsia as a result of complication from heart failure, kidney failure, pulmonary edema, and brain hemorrhage.[6]

Women with history of eclampsia have increased risk of preeclampsia in the next pregnancy. The rate is about 25% with higher risk if the onset of eclampsia was in the second trimester of pregnancy. More than that, there is a potential for long term sequela. Recent study shows eclampsia was associated with a 12-fold increased risk of cardiovascular morbidity, such as cerebrovascular disease, myocardial infarction, acute heart failure, cardiomyopathy, or cardiac arrest.[7]

Antenatal care plays an important role in early detection and prevention in pregnancy. Our patient caried out routine antenatal care at hospital and has no record of hypertension before or during pregnancy.

HELLP syndrome is a life-threatening condition frequently associated with severe preeclampsia-eclampsia and is characterized by three hallmark features of hemolysis, elevated liver enzymes, and low platelets.[8] In this case, the clinical and supportive findings were proved to the diagnosis of eclampsia with HELLP syndrome.

Others literature reports the incidence oh HELLP syndrome in patient with pregnancy-induced hypertension range from 2 to 29.3%, while prenatal mortality rate can reach from 7 to 60%.[8]

Traditionally, HELLP Syndrome considered to be a variant of preeclampsia, in fact, it is a specific disease since not all of the pregnant women with HELLP syndrome have a history of hypertension or proteinuria. There are some potential etiologic factors of HELLP syndrome such as, immunological changes, platelet aggregation, endothelial dysfunction, arterial hypertension and an inborn error of fatty acid oxidative metabolism.[8]

Intracerebral hemorrhage is a rare complication to occur during pregnancy and delivery. Intracerebral hemorrhage associated with eclampsia is responsible for 5–12% of maternal deaths during pregnancy. Other studies stated that, gestational hypertension, preeclampsia/eclampsia, and low platelet count were significant independent risk factors for ICH during pregnancy, and accounted for 30.5% of ICH.[5]

Contrary to what is published, our patient did not have any of the known risk factors for ICH, such as maternal age >35, African American race, tobacco dependence, substance abuse, coagulopathy, or previous preeclampsia/eclampsia.[5] Intracerebral hemorrhage in this case was believed due to the escalation in the BP, with normal prenatal care. No underlying vascular

malformation or aneurysm was found by postoperative MRI CT-scan.

The pathophysiology of intracerebral hemorrhage associated with preeclampsia due to increase blood pressure which leads to disturbed cerebral auto regulation, cerebral hyper perfusion, blood brain barrier (BBB) disruption leading to formation of cerebral edema and damage to the vascular endothelium. There is an increased risk of intracerebral hemorrhage with preeclampsia during pregnancy, mostly in third trimester or post-partum period.[5]

The definitive diagnosis is by computed tomography scan (CT-scan), and by Magnetic Resonance Imaging (MRI). CT-scan without contras is the most common used to diagnose intracerebral hemorrhage due to its wide availability and high sensitivity and specificity. Indication for decompression craniectomy or craniotomy with surgical evacuation of the clot is indicated if there is a declining conscious state or worsening neurological deficit.[9] Our patient did not undergo craniectomy or craniotomy due to minimum hemorrhage about 2.8ml in left intraparenchymal lobes. She received conservative treatment for the hemorrhages with nicardipine and mannitol intravenous for lowering blood pressure and intracranial pressure.

Kulsum et. al.[6] case report of 23-years-old pregnant woman with G2D1A0 had eclampsia accompanied by HELLP syndrome and ICH. Similar to our case report, the difference is their patient had extensive ICH approximately 120cc where our patient had approximately 2.8cc.[6]

Other study from Verma et al.[1] reported a 35-years-old pregnant woman with second gravida admitted to emergency department with altered sensorium, aphasia, and hemiparesis. Before admission she had severe headache and became unconscious. In line with our patient where she complains about headache and projectile vomit and followed by general seizure.[1]

The most common causes for intubation and mechanical ventilation in eclampsia were

acute respiratory distress syndrome (ARDS), hemodynamic instability, and a history of emergency cesarean section. ARDS is a serious complication with mortality rates

50% respectively. It might prompt the need for mechanical ventilation to also support the cerebral perfusion. On the other hand, patient with severe eclampsia and HELLP syndrome should receive parenteral magnesium sulfate therapy for convulsion. One of its side effects is respiratory muscle depression that might exacerbate respiratory problems.[3]

The rehabilitation program was designed to facilitate a safe and effective recovery by addressing multiple aspects of the patient's functional health. A key focus was preventing complications associated with prolonged immobilization, such as pneumonia, deep vein thrombosis, and muscle deconditioning.[3] Improving respiratory function was also a priority, ensuring effective airway clearance and facilitating ventilatory weaning through breathing exercises.[4] Restoring functional independence was another essential goal, achieved through a structured progression of mobility exercises that supported the patient's ability to sit, stand, and walk safely.[5] Additionally, enhancing cardiovascular endurance was emphasized to help the patient regain strength and stamina for daily activities, particularly in her role as a mother, including carrying and breastfeeding her baby.[4] These objectives shaped the rehabilitation strategy, ensuring a multidisciplinary approach tailored to the patient's needs while promoting long-term recovery and quality of life.

Airway clearance technique in this patient is initiated with chest therapy by physiotherapy and low-pressure mechanical cough assist since patient is not conscious and there is no contraindication such as undrained pneumothorax, bullous emphysema, and barotrauma. When patient was alert and cooperative, the airway clearance technique was shifted to active breathing exercise to promote diaphragm excursion and huffing ability. This pulmonary rehabilitation program was proved to support early

ventilatory weaning and prevent ventilatory associated infection (VAP).

Severe elevations in blood pressure can cause cerebrovascular injury in the form of hypertensive encephalopathy with a massive increase in intracranial pressure and resultant cerebral edema or intracranial hemorrhage. To avoid this, antihypertensive medications are used to maintain BP without compromising cerebral perfusion flow. Studies from Shigemi et al.[4] suggest that physiotherapy during pregnancy can help prevent or treat musculoskeletal discomfort and pain, gestational diabetes, or hypertensive disease. Shigemi et al.[4] stated that in their country, Japan, physical therapy are not commonly performed although it can be reimbursed through public insurance. This may be because there is no recommendation of physical therapy and rehabilitation for pregnant women or because the is an insufficient in knowledge on these treatments among physicians.[4]

Blood pressure instability is one of the challenging conditions to mobilize this patient aggressively. In this condition, we must have close collaboration with anesthesiologist to adjust the dosage of antihypertensive medication in a safe range (140-150/90-100) to support progressive mobilization program. In this state, rehabilitation target initially to support brain oxygenation with positioning 30 degrees.

After patient was extubated and blood pressure was stable, the rehabilitation program should be focus to increase the activity daily living include mobility, and also cardiorespiratory endurance. As a physical medicine and rehabilitation doctor, we should pay attention to her role as a new mother for carrying and breastfeeding her baby in perspective of physical activity level. Based on the compendium, minimal METs around 2 to 2.5 is required. In this patient, we started to prescribe low to moderate intensity of aerobic exercise as seen in Table 1.

CONCLUSION

Rehabilitation approach in eclampsia with superimposed intraparenchymal

hemorrhages could start safely as early as possible by collaboration with the intensivist. The rehabilitation program to support brain oxygenation and prevent complication that caused by immobilization was evident to help ventilation weaning program and improve patient's mobility scale. The sustainable rehabilitation program that focuses in independency of activity daily living and improvement of cardiorespiratory endurance could help preparing the patient to gain her role as a mother before discharge.

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