

**CASE REPORT****Management of Eclampsia Patients Post-ROSC (Return of Spontaneous Circulation) at RSUP M Djamil Padang**

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**Abstract**

**Background:** Eclampsia is a convulsive condition associated with hypertensive disorders in pregnancy which threatens maternal and fetal life which generally requires intensive care. Worsening conditions can complicate multi-organ disorders, coagulation disorders, and infections.

**Case:** A 20 year old, nulliparous woman, preterm gestational age 35-36 weeks of gestation, referred to M Djamil General Hospital with complaints of 3 seizures at home and loss of consciousness. At the time of examination, we found apathetic consciousness; blood pressure of 210/118 mmHg. Urine protein is +3. The patient was terminated by emergency cesarean section. The patient was anesthetized under general anesthesia, and was treated in the postoperative intensive care unit with a ventilator attached. During hospitalization, the patient developed recurrent seizure, laryngeal edema and cardiac arrest, but returned to circulation spontaneously after resuscitation. Hemodynamic and metabolic monitoring is strict on the patient and managed appropriately with good result.

**Discussion:** Eclampsia preceded by preeclampsia is known as a theoretical disease with a two-stage pathogenesis. The principles of eclampsia management are control of seizure, regulation of blood pressure, and termination of pregnancy. Collaboration between multidisciplinary teams determines the success of managing eclampsia cases and improving outcomes for the better.

**Keywords:** eclampsia, intensive therapy, obstetric emergency

## INTRODUCTION

Eclampsia is a complication of preeclampsia known to occur during pregnancy and is associated with maternal and fetal morbidity and mortality if not correctly diagnosed. Preeclampsia and eclampsia are among the four categories related to hypertensive disorders in pregnancy.<sup>1</sup> Eclampsia is characterized by one or more generalized tonic-clonic seizures or a decrease in consciousness in women associated with hypertensive disorders in pregnancy. About 10% of pregnancies experience hypertensive disorders, and eclampsia occurs in 0.8% of women with hypertensive disorders.<sup>2</sup>

The incidence of eclampsia in industrialized countries averages 1 per 2000 to 3000 deliveries per year.<sup>3</sup> It has been reported as 1.6 to 10 per 10,000 deliveries in developed countries, whereas in developing countries it is 50 to 151 per 10,000 deliveries. In addition, low-resource countries have much higher maternal and perinatal mortality and morbidity rates.<sup>4</sup> Preeclampsia contributes to 15 per 100,000 maternal deaths worldwide. In Western countries, 7-10% of all pregnancies cause a 3-25 fold increase in the risk of severe obstetric complications; 0.5-2% of these cases develop into eclampsia. In 2015, approximately 42,000 women died from hypertensive disorders in pregnancy worldwide; more than 99% of these deaths occurred in low- and middle-income countries.<sup>4</sup> According to WHO data, Indonesia recorded maternal mortality in 2019 at 177 per 100,000 live births, with hypertensive disorders in pregnancy as the second leading cause after bleeding.<sup>5</sup> Preeclampsia and eclampsia account for 30-40% of perinatal deaths.<sup>6</sup> Meanwhile, the incidence of preeclampsia in Indonesia is 3-7% in nulliparous women and 0.8-5% in multiparous women.

In West Sumatra, preeclampsia-eclampsia ranks first as the cause of maternal mortality. Medical records data from RSUP Dr. M. Djamil Padang show that hypertensive disorders in pregnancy are the leading cause of maternal mortality, accounting for 22.3% of all maternal deaths in 2019.<sup>7</sup> This highlights the significant impact of eclampsia on maternal and perinatal outcomes and underscores the importance of timely diagnosis and appropriate management in reducing morbidity and mortality associated with this condition.

Early detection and management of preeclampsia, eclampsia, and HELLP syndrome are key as they help prevent severe complications.<sup>8</sup>

## CASE REPORT

A 22-year-old woman was referred from Padang Panjang Regional Hospital with a diagnosis of eclampsia. She experienced three seizures at home, each lasting 1-2 minutes, followed by a loss of consciousness after the seizures. According to her family, she complained of blurred vision and headache before the seizures. The patient was referred to RSUP M Djamil with a MgSO<sub>4</sub> regimen. She was pregnant with her first child without signs of labor,



The patient underwent a cesarean section under general anesthesia and was treated in the intensive care unit for postoperative recovery due to unstable hemodynamics, decreased consciousness, and target organ damage. The patient received fluid balance monitoring, antibiotics, analgesics, and antihypertensive drugs. The patient was treated with a ventilator and sedative medications, with regular blood tests. Three hours post-operation, the patient experienced one seizure, which subsided after being administered 10 mg of diazepam as an anticonvulsant. On the second day, the patient developed hyperkalemia (5.1 mg/dL) and hypoalbuminemia (2.4 mg/dL), which were corrected with Ca polystyrene sulfonate and 20% albumin infusion. On the third day, the patient experienced desaturation, pulmonary edema, and subsequent cardiac arrest, exacerbated by laryngeal edema, making it difficult to reposition and reintubate with an endotracheal tube. Four cycles of cardiopulmonary resuscitation were performed, and the patient achieved Return of Spontaneous Circulation (ROSC) with support from norepinephrine, dobutamine, epinephrine injections, diuretics (furosemide 40 mg/24 hours), and steroid administration (dexamethasone 5 mg/8 hours) to reduce laryngeal inflammation. On the fourth day, the patient experienced respiratory acidosis, which was corrected. The patient also had abdominal distension suspected to be paralytic ileus, consulted with the digestive surgery division, and was advised to receive conservative treatment with medication. The patient's condition gradually improved and was transferred to the obstetric ward in a stable condition.



**Figure 2. Abdominal Distension (Source: Personal Documentation)**

## **DISCUSSION**

Eclampsia is rare but a serious complication of preeclampsia.<sup>9</sup> The exact etiology of eclampsia remains unclear, despite advances in understanding preeclampsia. It is proposed that there is an increased permeability of the blood-brain barrier during preeclampsia, leading to changes in cerebral blood flow due to autoregulation disturbances.<sup>10</sup> The occurrence of preeclampsia is also influenced by racial, ethnic, and genetic predispositions. Several clinical factors summarized by Bartsch et al. (2016), involving data from over 25 million pregnancies, include advanced maternal age, nulliparity, obesity, diabetes, chronic hypertension, HELLP syndrome in previous pregnancies, and underlying metabolic diseases such as

hyperhomocysteinemia or chronic kidney disease.<sup>3</sup> In the case we reported, risk factors related to eclampsia were nulliparity, twin pregnancy, young age, and overweight with a BMI of 27.21.

In this case, according to the family, the patient complained of headaches and blurred vision before the seizures. Seizures in eclampsia are caused by the excessive release of excitatory neurotransmitters, particularly glutamate, massive neuronal depolarization, and bursts of action potentials. Scotomata refers to blurred vision or diplopia commonly occurring in severe preeclampsia and eclampsia.<sup>11</sup>

In this patient, proteinuria was +3. The severity of 24-hour proteinuria can predict adverse outcomes in women with preeclampsia, thus proteinuria is still used as a monitoring index in patients with preeclampsia.<sup>12</sup>

Preeclampsia has been dubbed as a disease of theories. Its concept has evolved over the centuries from being a specific kidney disease leading to chronic nephritis to a toxemia state caused by circulating toxins.<sup>13</sup>

The pathogenesis of preeclampsia is divided into two stages. The first asymptomatic stage is characterized by abnormal placental formation and the release of placental factors into maternal circulation. During this stage, placental cytotrophoblasts in preeclampsia fail to transform from the proliferative epithelial subtype to the invasive endothelial subtype, leading to the failure of spiral artery remodeling. The second stage is symptomatic, resulting in hypertension and proteinuria, which can eventually lead to brain angiospasm causing eclampsia.<sup>14</sup> This leads to a syndrome of imbalance in angiogenic factors circulating in the maternal circulation.

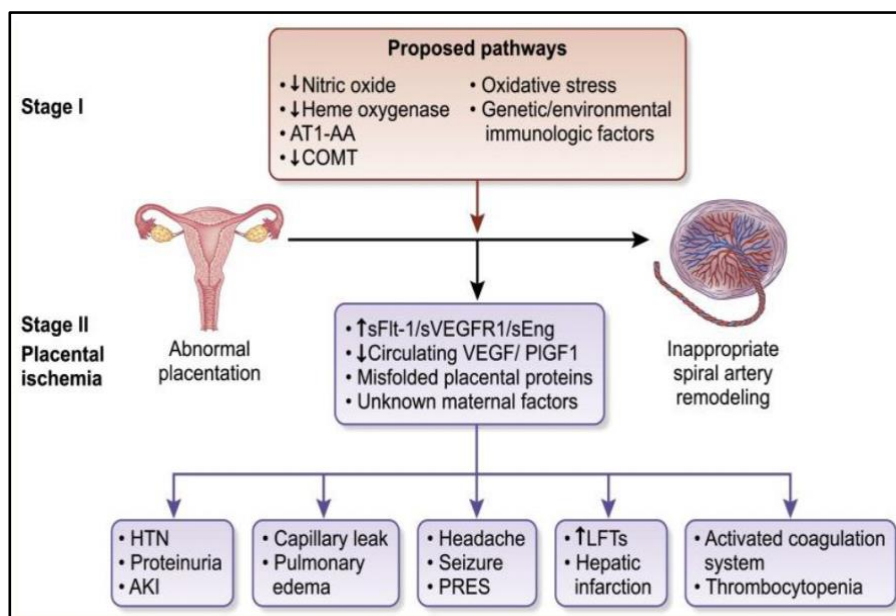


Figure 3. Pathogenesis of Preeclampsia: Two-Stage Model.<sup>13</sup>

The current philosophy followed in the United States regarding the management of eclampsia includes: 1. Controlling seizures using an initial dose of magnesium sulfate administered intravenously, followed by maintenance doses. 2. Intermittent administration of antihypertensive drugs to lower blood pressure. 3. Avoiding diuretics unless pulmonary edema is evident, restricting intravenous fluid administration except in cases of excessive fluid loss, and avoiding hyperosmotic agents. 4. Termination of pregnancy.<sup>11</sup>

Upon diagnosis of eclampsia in this patient, an initial dose of MgSO<sub>4</sub> regimen was immediately administered, followed by maintenance until 24 hours postpartum. According to Cunningham et al., 2018, magnesium sulfate is highly effective in preventing seizures in women with preeclampsia and stopping them in women with eclampsia, and is an effective anticonvulsant that prevents central nervous system depression. The dosage for severe preeclampsia is the same as for eclampsia. Since labor is a time when seizures are more likely to occur, women with preeclampsia-eclampsia are usually given magnesium sulfate during labor and for 24 hours postpartum.<sup>11</sup> The basic concept of seizure control is to prevent maternal injury, ensure oxygenation, provide cardiac respiratory support, and prevent aspiration. Magnesium sulfate (MgSO<sub>4</sub>) is the anticonvulsant drug of choice. In the IV regimen, MgSO<sub>4</sub> is administered as a 4 g IV bolus followed by 1-2 g/hour as a maintenance infusion with monitoring of patellar reflexes, respiratory rate, and urine output.<sup>15</sup>

For preparation of termination, the patient in this case was referred to an anesthesiologist for anesthetic management during surgery and intensive post-operative management. The role of the anesthesiologist in eclampsia is to assist the obstetrician in controlling and preventing further seizures, controlling blood pressure, clearing the airway, preventing major complications, providing labor analgesia, and administering anesthesia during cesarean section.<sup>15 16</sup>

Assessment of target organ involvement includes: cardiovascular system (control of hypertension, left ventricular function, and intravascular depletion/check osmolality), respiratory system (for signs of pulmonary edema), kidneys (degree of oliguria and creatinine levels), liver (liver function tests, clinical picture of liver capsule stretching), coagulation profile (platelet count, prothrombin time, activated partial thromboplastin time), airway examination (degree of airway edema), and blood gas analysis (acidemia).<sup>15</sup>

This patient underwent cesarean section under general anesthesia, and during the stay, developed laryngeal edema. Spinal anesthesia is safer than general anesthesia in stable vital signs conditions. General Anesthesia (GA) is chosen for unconscious patients and those with decreased consciousness with evidence of increased ICP (Intracranial Pressure). Anesthesia is achieved with opioid and relaxant techniques as well as deliberate hyperventilation. Important considerations include airway edema, potential difficult airway management, although cholinesterase levels decrease, the duration of action of local anesthetics succinylcholine and esters is rarely affected, excessive hypertensive response to endotracheal intubation, drug interactions between magnesium and muscle relaxants, and small doses of volatile halogenated agents can prevent awareness. Extubation is performed

in the left lateral position when the patient is fully conscious or the patient is transferred to the Intensive Observation Room (ROI) for ventilation support depending on preoperative condition and intraoperative behavior.<sup>15 17</sup>

Complications such as Acute Respiratory Distress Syndrome occur in <1% of patients with eclampsia or severe preeclampsia with HELLP syndrome. This condition necessitates mechanical ventilation. It has been reported that antepartum and postpartum ARDS (Acute Respiratory Distress Syndrome) mortality rates are 23% and 50%, respectively. One thing to remember in this setting is that these patients typically have laryngeal edema which can complicate intubation and cause death. For this reason, surgical assistance should be available to provide emergency surgical airway access if needed. The most common indications for intubation and mechanical ventilation are respiratory failure, unstable hemodynamics, and a history of emergency cesarean section.<sup>16</sup>

Strict postpartum monitoring includes vital signs, fluid intake and output, and symptoms for at least 48 hours. Patients typically receive large amounts of intravenous fluids during labor, delivery, and postpartum. Additionally, during the postpartum period, there is mobilization of extracellular fluid, leading to an increase in intravascular volume, putting women with eclampsia who have abnormal renal function, placental abruption, and pre-existing chronic hypertension at higher risk for pulmonary edema and exacerbation of severe hypertension. Therefore, continued monitoring during the postpartum period is crucial. Postpartum fluid administration should be limited to allow natural diuresis, which typically occurs around 36-48 hours postpartum. The total amount of fluids (total intravenous and oral fluids) should be restricted to 80 ml/hour. Fluid restriction is usually continued during magnesium sulfate treatment; however, increased fluid intake is allowed earlier in the presence of significant diuresis. Parenteral magnesium sulfate should be continued for at least 24 hours after delivery and/or at least 24 hours after the last seizure. Antihypertensive therapy with methyldopa can be withheld in favor of calcium channel blockers, beta-blockers, or alpha-blockers.<sup>15</sup>

## **CONCLUSION**

Eclampsia is a serious condition that can threaten the lives of both the mother and the fetus, requiring comprehensive care. This case report describes eclampsia in a nulliparous woman with a twin pregnancy, who underwent emergency termination and received intensive post-procedural care. The management of this patient was appropriate according to the literature, with a good outcome. Early diagnosis and immediate treatment by a multidisciplinary team in the ICU can prevent complications and reduce morbidity and mortality.

**REFERENCES**

1. Espinoza, J., Vidaeff, A., Pettker, C. M. & Simhan, H. *ACOG PRACTICE BULLETIN Clinical Management Guidelines for Obstetrician-Gynecologists*. <http://journals.lww.com/greenjournal> (2020).
2. Fishel Bartal, M. & Sibai, B. M. Eclampsia in the 21st century. *American Journal of Obstetrics and Gynecology* vol. 226 S1237–S1253 Preprint at <https://doi.org/10.1016/j.ajog.2020.09.037> (2022).
3. Cunningham, F., Leveno, K., Dashe, J. & et al. *Williams Obstetric Edisi 26*. (Mc Grow Hill, 2022).
4. Vousden, N. *et al.* Incidence of eclampsia and related complications across 10 low-and middle source geographical regions: Secondary analysis of a cluster randomised controlled trial. *PLoS Med***16**, (2019).
5. World Health Organization. WHO Region and Global Statistics. <https://www.who.int/data/gho/publications/world-health-statistics> (2022).
6. Fegita, P. Hubungan Defisiensi Zink dengan Preeklampsia. *Jurnal Andalas* 1–7 (2018).
7. *Data Rekam Medis RSUP M Djamil*. (2022).
8. Creasy, R. K., Resnik, Robert. & Iams, J. D. *Creasy and Resnik's maternal-fetal medicine : principles and practice*. (Saunders/Elsevier, 2018).
9. Adie, V. & Moodley, J. Atypical eclampsia. *J Obstet Gynaecol (Lahore)***25**, 352 (2005).
10. Bergman, L. *et al.* Investigating Maternal Brain Alterations in Preeclampsia: the Need for a Multidisciplinary Effort. *Curr Hypertens Rep***21**, (2019).
11. Cunningham., et al. *Williams Obstetrics*. (Prentice Hall International Inc Appleton, 2018).
12. Lei, T. *et al.* Proteinuria may be an indicator of adverse pregnancy outcomes in patients with preeclampsia: a retrospective study. *Reproductive Biology and Endocrinology***19**, (2021).
13. Phipps, E., Prasanna, D., Brima, W. & Jim, B. Preeclampsia: Updates in pathogenesis, definitions, and guidelines. *Clinical Journal of the American Society of Nephrology* vol. 11 1102–1113 Preprint at <https://doi.org/10.2215/CJN.12081115> (2016).
14. Ahmed, A., Rezai, H. & Broadway-Stringer, S. Evidence-based revised view of the pathophysiology of preeclampsia. in *Advances in Experimental Medicine and Biology* vol. 956 355–374 (Springer New York LLC, 2017).
15. Parthasarathy, S., Hemanth Kumar, V., Sripriya, R. & Ravishankar, M. Anesthetic management of a patient presenting with eclampsia. *Anesth Essays Res***7**, 307 (2013).
16. Lam, M. & Dierking, E. Intensive Care Unit issues in eclampsia and HELLP syndrome. *International Journal of Critical Illness and Injury Science* vol. 7 136–141 Preprint at [https://doi.org/10.4103/IJCIIS.IJCIIS\\_33\\_17](https://doi.org/10.4103/IJCIIS.IJCIIS_33_17) (2017).
17. Aregawi, A., Terefe, T., Admasu, W. & Akalu, L. Comparing the Effect of Spinal and General Anaesthesia for Pre-Eclamptic Mothers Who Underwent Caesarean Delivery in A Tertiary, Addis Ababa, Ethiopia. *Ethiop J Health Sci***28**, 443–450 (2018).