Instructor Guide

Group Case Study Discussion: Eclampsia

It is important to remember that you have only <u>20 minutes</u> to complete this case. Manage time carefully so that the majority of group discussion is spent on the following teaching points using a case-based approach:

- Recognition of signs and symptoms of preeclampsia
- Proper use of magnesium sulfate (MgSO4): dosing, indications, and its effects on patient and fetal heart rate (FHR) tracing
- Appropriate response to post-seizure fetal bradycardia
- Indications and use of antihypertensives

Instructors: The answers to the questions in the slides as provided below do not necessarily cover all potential answers. They are being provided in this document to help facilitate group discussion but are not necessarily all-encompassing.

Case Discussion

Slide 3 - History

A 19-year-old Gravida 1 Para 0 presents to the labor and delivery department at 39 weeks' gestation with painful contractions. They are from out of town and are visiting in your area. In taking their history, they tell you that their pregnancy has been uncomplicated except for a urinary tract infection in the first trimester and that their group B streptococcus culture at 36 weeks' gestation was negative. They did gain 60 pounds with this pregnancy and report generalized edema. They have no allergies, and their only medication is prenatal vitamins. They have no other medical conditions.

Slide 4 - Initial Evaluation

On examination, their blood pressure (BP) is 164/102 mm Hg. Five minutes later, their BP is 160/100 mm Hg. A urine dipstick shows 1+ proteinuria. Their membranes are intact, they have had no vaginal bleeding, and their cervix is 4-cm dilated, 100% effaced, and -1 station. They deny headache, epigastric pain, or vision changes. The external fetal monitor shows a Category I FHR tracing. The baseline FHR is 140 BPM, moderate variability, and no decelerations. They are contracting every 3 minutes

Slide 5 - Group Discussion

What blood tests would you obtain?

- Complete blood count (platelets)
- Urinalysis or urine protein/creatinine ratio
- Basic metabolic panel (creatinine)
- Liver enzymes (alanine aminotransaminase, aspartate transaminase, lactate dehydrogenase)
- Type and screen

Slide 6 - Group Discussion

What other data would be helpful at this point in your assessment?

- Prenatal records
- Ultrasound reports

Slide 7 - Group Discussion

Given the information provided thus far, what concerns you?

- Preeclampsia

Slide 8 - Case Continues: 30 Minutes Later

Before laboratory tests can be obtained, you are called to the patient's room. The nurse reports the patient just had a grand mal seizure that lasted approximately 60 seconds. Moments later while an intravenous (IV) line is being inserted, you witness a second grand mal seizure that lasts another 60 seconds. The external fetal monitor shows an FHR in the 80s shortly after the second seizure.

Slide 9 - Group Discussion

What would you do in response to the seizures?

- Turn person to the left lateral side-lying position
- Administer oxygen 10 L via non-rebreather face mask
- Protect the airway, have suction available
- Start a second IV line
- Bolus with MgSO4, 6 g IV over 20 minutes, then begin maintenance dose of 2 g/hour
- Place Foley catheter to closely monitor intake and output
- Person should have nothing by mouth
- Type and screen for 2 U of packed red blood cells
- Artificial rupture of membranes if possible (to augment labor and for internal fetal monitoring)
- Further augmentation of labor with oxytocin (if maternal/fetal status stabilized)

Rationale of Interventions
The treatment after an eclamptic seizure includes delivery. Because the person is at greater than 34 weeks' gestation, there is no indication for corticosteroids. If a person with eclampsia is not in labor and is at greater than 32 weeks' gestation, induction of labor can begin after MgSO4 has been bolused and the person has been stabilized. Even in the case of an unripe cervix, many people with preeclampsia/eclampsia are easily induced. In the setting of an unripe cervix at less than 32 weeks' gestation, primary cesarean delivery may be considered.

Slide 10 - Group Discussion

What is the likely cause of fetal bradycardia in this situation?

- Due to the eclamptic seizure (resulting from uterine hyperactivity during the seizure)
- However, keep in mind the possibility of placental abruption

Slide 11 - Group Discussion

Should you proceed to an immediate cesarean delivery at this time?

- No. It is best to avoid immediate cesarean delivery if the seizures and fetal bradycardia resolve

Slide 12 - Case Continues: After the Seizures

The person has received MgSO4 6 g IV loading dose and has been started on a maintenance dose of 2 g/hour. A Foley catheter is placed, and their urine output is carefully monitored. An amniotomy is performed, and a fetal scalp electrode and intrauterine pressure catheter are placed. The amniotic fluid shows scant, thin meconium. Shortly after the second seizure, when oxygen was administered and the person was placed in the left lateral position, the fetal bradycardia recovered quickly. Her baseline rate is now 160 BPM and there is minimal variability. The operative team is alerted and is on standby. Her BP level now is 180/110 mm Hg. She is having contractions every 2 to 3 minutes lasting 60 to 90 seconds.

Slide 13 - Group Discussion

What should you focus on doing right now with this patient?

- Stabilizing BP level

Slide 14 - Group Discussion

Why should you be concerned about her BP?

- BP levels that equal or exceed 160/110 mm Hg should be treated with antihypertensive agents
- Need to avoid maternal central nervous system damage

Slide 15 - Group Discussion

What range should the diastolic BP level be lowered to?

- The goal is a diastolic BP range of 90 to 100 mm Hg

Slide 16 - Group Discussion

Will MgSO4 lower her BP level?

- No. MgSO4 is not an antihypertensive and has minimal effect on BP
- MgSO4 is used in eclampsia for seizure prophylaxis

Slide 17 - Group Discussion

What are the antihypertensive drug options and dosages that could be used to lower her BP level?

- Labetalol, 20 mg IV administered over 2 minutes
- Hydralazine, 5 tmg IV administered over 2 minutes or IM
- Oral nifedipine is an acceptable option (especially if no IV access available) with 10 to 20 mg initial dose

Oral drugs have not traditionally been recommended for intrapartum care management of severe range BP levels due to concerns about potential adverse fetal effects if hypotension occurs. In studies, nifedipine has been shown to control BP more rapidly than labetalol.

Slide 18 - Group Discussion

Given the circumstances of this case, what might be the reason(s) for this FHR tracing?

- MgSO4 administration
- Post-eclamptic seizure
- Minimal variability post-fetal bradycardic episode is a common finding

Slide 19 - Case Continues: Patient Data

After administering antihypertensive drugs, their BP level is now 140/95 mm Hg, pulse 90 BPM, respirations 12 breaths/minute, and temperature 100.2º F. Their urine output over the past hour has been 30 mL.

Slide 20 - Case Continues: Laboratory Test Results

You receive their laboratory test results, which were obtained after seizures, and find the following: hemoglobin = 12 g/dL, hematocrit = 36%, white blood cell count = 21,000/mm3, liver enzymes are normal except for an elevated alkaline phosphatase of 200 IU/L. Their platelet count is 185,000/uL. Their magnesium level is 7 mg/dL (Keeping in mind the therapeutic range of 4.8 to 8.4 mg/dL). Their partial thromboplastin time, prothrombin time-International Normalized Ratio, and fibrinogen levels are also normal

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Slide 21 - Group Discussion

The patient has another grand mal seizure. Considering they have a therapeutic magnesium level, what would you do next?

- Bolus with an additional 2 g $MgSO_4$
- A second neuroleptic agent should generally be used in the person who continues to seize despite having a therapeutic magnesium level, such as a short acting barbiturate

Slide 22 - Group Discussion

Do they have HELLP syndrome?

- No. Hemolysis, Elevated Liver enzymes, and Low Platelet counts are all absent

Slide 23 - Group Discussion

Should antibiotics be started? Is she septic?

- No to both. Their elevated white blood cell count could be related to other factors (possibly even their seizure because laboratory test results were obtained afterward). There are no other signs or symptoms of infection

Slide 24 - Group Discussion

Would treatment of the patient have been different if their seizures were focal seizures?

- Yes. Computed tomography scan (without contrast) of the head would be indicated, as focal seizures can indicate intracranial hemorrhage

Slide 25 - Case Continues: The Delivery

With oxytocin augmentation, they progress to complete cervical dilation and have a successful vaginal delivery of an 8-lb, 3-oz male infant with Apgar scores of 6 and 9. The placenta delivers spontaneously and appears intact. They have no uterine atony, no lacerations, and no postpartum hemorrhage.

Slide 26 - Group Discussion

Do you continue $MgSO_4$?

- Yes. Unless they show signs of magnesium toxicity

If so, at what point would you discontinue it?

- Continue the $MgSO_4$ infusion until 24 hours postpartum

Slide 27 - Group Discussion

If this person had experienced uterine atony and increased bleeding postpartum, what uterotonic drug would you avoid using?

- Methergine, as it can possibly cause increased hypertension and lead to a potential cardiovascular accident

Instead, what should be the first intervention and drug of choice to stop the increased bleeding?

- Suggest uterine massage and oxytocin

Slide 28 - Group Discussion

How would your seizure treatment have differed if the person had a history of grand mal seizures?

- Check anticonvulsant levels and compliance with anticonvulsants
- Continue to administer MgSO4 because of eclampsia, but also increase anticonvulsant drug dosage if anticonvulsant levels are low

Slide 29 - Group Discussion

What would you do if this person had presented with an eclamptic seizure at 36 weeks' gestation, an unripe cervix, and no evidence of labor?

- At 36 weeks' gestation, induction would still be appropriate even if the cervix was not ripe.
- Cesarean delivery should not be performed at 36 weeks' gestation without a trial of labor induction.
- If the person was at less than 32 weeks' gestation with an unripe cervix, cesarean delivery may be considered