



Case 3: Superimposed Preeclampsia with Progression to Eclampsia

Learning Objectives:

- Be able to recognize risk factors for eclampsia.
- Identify severe range hypertension, superimposed preeclampsia/HELLP syndrome, and eclamptic seizure, and be able to treat with appropriate medications in a timely manner.
- Demonstrate teamwork and communication skills during a simulated hypertensive emergency simulation progressing to eclamptic seizure.

Planned Completion Points:

In order to successfully complete this scenario, the care team should do the following:

- Recognize severe range hypertension.
- Make the diagnosis of superimposed preeclampsia/HELLP syndrome based upon blood pressures and laboratory values.
- Make the diagnosis of eclamptic seizure.
- Administer antihypertensive medications and IV magnesium correctly and efficiently.
- Appropriately stabilize a patient having a presumed eclamptic seizure.
- Counsel the patient regarding delivery recommendations after an eclamptic seizure

Expected Duration of Exercise:

Approximately 35 minutes (15 minutes for simulation / 20 minutes for debriefing)

1.0 Simulation Setup:

- ▶ **Simulators to be used:** The simulator to be used will depend on your institution. If using a high-fidelity simulator, ideally the simulator would be able to mimic seizure activity and there would be a monitor with real-time vital signs and fetal heart rate tracings.
- ▶ **Room Setup:** The OB triage area/room should be stocked and in the same condition it would for actual patients at your institution.
- ▶ **Simulator Setup:** The simulator / simulated patient should be in a patient bed with a gown on. An IV should be in place (taped to the arm) saline locked.
- ▶ **Vital Signs:** If your simulator has the ability to show maternal vital signs on a monitor, you can use this during the scenario. If not, you can use the provided vital signs cards to report the values during the case.
- ▶ **Fetal Monitoring:** If your simulator has the ability to show tocodynamometer and external fetal heart rate tracing, you can use this during the scenario. If not, you can use provided fetal heart rate tracing cards or metronome app to report changes in fetal status during the case.
- ▶ **Simulation Pre-Brief:** Gather the care team together and perform the Pre-Simulation Briefing/Orientation.

2.0 Pre-Simulation Briefing/Orientation:

Prior to the simulation, you should brief the team on the drill. Begin by orienting them to the simulator and its capabilities and limitations. Then, explain the following:

- Emphasize that the drill is meant for training and it is not a test.
- Treat the simulator as they would a real patient. Explain how the patient will respond to their questions (i.e. will the simulator “speak” or will there be a human voice responding for the patient).
- If the team needs additional supplies or instruments, they should actually go and obtain them.
- Call for assistance and other providers (anesthesiologist, etc.) as they would in a real emergency.
- If they feel they need to take the patient to the operating room, they should physically move the “patient” to that location.
- Medications, if needed, should be obtained in the normal manner, but not opened or actually used during the drill.
- Depending on how you will demonstrate eclamptic seizure and vital signs, explain how this will occur (vital signs will be displayed on a computer monitor vs. displayed on cards).

3.0 Basic Scenario Management and Tips:

Beginning the Simulation Scenario:

- ▶ After you have conducted your pre-simulation briefing/orientation, have the primary OB nurse/provider come with you to the simulated patient's room.
- ▶ To begin the scenario, read the scenario to the nurse and then have them enter the room. At this point, the voice of the patient should tell the nurse she is feeling "really terrible...something is not OK."
- ▶ The scenario should end when the team has done the following:
 - Diagnosed the patient with eclamptic seizure and HELLP syndrome.
 - Administered at least one dose of appropriate antihypertensive medication.
 - Initiated IV magnesium bolus.
 - Provided patient safety and support during seizure event, including supplemental O2.
 - Discussed delivery plan once patient is stabilized.

OR

- If 10 minutes has elapsed and the team has not stabilized the patient following the above steps.

4.0 Case Scenario:

CASE:

Patient: Eunice Joseph

Patient Information:

- Ms. Joseph is a 34 y/o G3P2002 at 27 weeks brought in by a family member to OB triage for an elevated blood pressure reading at home. The patient has chronic hypertension and gestational diabetes in this pregnancy. Patient stated she felt her "head was heavy" all day and took her blood pressure at home with the blood pressure cuff her PCP gave her before pregnancy and the reading was 200/110. She already took her morning dose of labetalol today.
- She has an obstetrical history of an uncomplicated vaginal delivery 5 years ago and a primary cesarean section for a placenta previa 2 years ago. Her second pregnancy was also complicated by postpartum preeclampsia with severe features.
- Medications: Metformin 1000 mg BID, Labetalol 600 mg BID, Aspirin 81mg daily, Prenatal vitamins.
- She has no known drug allergies
- Baseline HTN labs: baseline Creatinine- 0.78 mg/dL, baseline Protein/Creatinine ratio- 0.1 mg/g Creat, baseline platelet count- 230 K/uL, baseline AST- 22 IU/L, baseline ALT- 40 IU/L
- Last ultrasound was done 3 weeks ago, and fetus was AGA, although you do not have the EFW from that report.
- Your intake nurse went ahead and placed an IV given patient's initial history and drew Type and Screen, Complete Blood Count, and Comprehensive Metabolic Panel, sending them stat to the lab.

Laboratory Data (on admission):

- MBT: B positive
- Hemoglobin: 13.0 g/dL
- Hematocrit: 40.1 %
- WBC: 12,000 K/uL
- Platelets: 123 K/uL
- AST 1334 IU/L
- ALT 1355 IU/L
- Cr 0.8 mg/dL

Information includes:

- The patient has a heplock IV line in place.
- Initial vital signs: BP 220/112, HR 105, RR 18 O2 sat 97% on room air.
 - If vital signs are repeated they will remain in the severe HTN range
- FHR Tracing: Baseline 130, minimal variability, no accelerations, no decelerations. Toco shows irritability.
- Limited bedside US: Complete breech, EFW 1300 grams, Amniotic Fluid Index = 3cm
- During seizure:
 - Vital signs: BP 220/112, HR 110, RR 8, O2 sat 93% (no change in O2 saturation regardless of supplemental oxygen)
 - FHR Tracing: Fetal bradycardia to 80s with minimal variability.
- After seizure resolves:
 - Vital signs:
 - If antihypertensives given: BP 149/92, HR 95, RR 14, O2 sat 96% on room air
 - If antihypertensives NOT given: BP 179/107, HR 95, RR 14, O2 sat 96% on room air
 - FHR Tracing: Baseline of 180s, minimal variability, no accelerations, no decelerations.

Family Member/Patient Instructions:

- ▶ **Standardized Patient:** If you have a person playing the role of the patient during the scenario, they can emphasize they have never felt this way before and that their head has felt heavy and they have felt out of sorts all day. In their postictal state, they are confused and wondering what happened to them and their baby.
- ▶ **Family Member:** You can also have someone play the role of the patient's family member. They can be at patient's bedside when the patient seizes and ask, "What is happening to her!?" repeatedly. You can be persistent but would not recommend interfering to the point where they would remove the family member from the room.

Answers to common questions that come up:

- The team can order labs during the simulation, but they will not come back during the simulation.
- The FHR tracing will demonstrate fetal bradycardia during the eclamptic seizure and will slowly recover after the seizure ends.
- If asked additional questions, try and redirect and not answer specifics so as not to introduce things that might confuse the scenario (i.e. don't say that she has a recent head trauma or family history of seizure disorder).

5.0 Case Flow/Algorithm with branch point and completion criteria:

Simulation facilitator will introduce the scenario to the team outside the room and then bring primary bedside provider to the patient's room and then read them the patient scenario. The OB Nurse should then enter the room, assess the patient, and then call for assistance as seizure begins.

"Initial" Vital Signs and FHR tracing should be on monitor. Vital signs may be repeated but will remain in the severe HTN range.

Patient should explain symptoms and after a brief history is taken will begin to have an eclamptic seizure.



OB Provider/team enters room when called and are briefed by OB Nurse

"During seizure" Vital Signs and FHR tracing should be available



OB Team should care for patient (put up handrails/place patient in left lateral position/continuous maternal pulse oximeter in place)

IV magnesium sulfate should be initiated

IV antihypertensives should be administered for severe range HTN



After approximately 2 minutes, the patient will stop seizing.
"After seizure" Vital Signs and FHR tracing should be on monitor.



Team should discuss the delivery plan and further management. They may talk with the patient / family members about additional care and delivery.

VITAL SIGNS
START
BP: 220/112
HR: 100 bpm
O2 sat: 98% on RA
RR: 18
VITALS DURING SEIZURE
BP: 220/112
HR: 110 bpm
O2 sat: 93%
RR: 8
VITALS AFTER SEIZURE ENDS
BP: 149/92 (if antihypertensive given) OR 179/107 (if no antihypertensives were given)
HR: 95 bpm
O2 sat: 96% on RA
RR: 14

Scenario ends when the team has done the following:

Diagnosed the patient with eclampsia
Administered at least one dose of an appropriate antihypertensive medication
Initiated IV magnesium sulfate therapy
Discuss delivery plan once patient is stabilized

OR

If 10 minutes have elapsed and above steps have not been taken

At the end of the scenario, clearly state the simulation is over and then gather the team for the review and debriefing.