Case 2: Preeclampsia with Development of Eclampsia

Learning Objectives:
- Identify hypertension in pregnancy as a risk factor for eclampsia
- Initiate rapid stabilization and treatment of a patient with eclamptic seizure
- Demonstrate teamwork and communication skills during a simulated hypertensive emergency simulation

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 eclampsia
- Demonstrate the "ABC's" in stabilizing a patient with eclampsia
- Administer IV magnesium and antihypertensive medications correctly and in a timely manner
- Counsel the patient regarding the need to move towards delivery

OR

- If 10 minutes have elapsed after beginning simulation and team has not recognized eclampsia or stabilized the patient by demonstrating "ABC's" and initiating magnesium sulfate

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.

▶ **Room Setup**: The delivery 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) with a bag of IV fluids hanging

▶ **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 tocodynamometry 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.
- If the team needs additional supplies or instruments, they should actually go and obtain them. In most cases, the necessary equipment will be in the room.
- Call for assistance and other providers (anesthesia, 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.

3.0 Basic Scenario Management and Tips:

Beginning the Simulation Scenario:
▶ After you have conducted your pre-simulation briefing/orientation, have the primary bedside provider (RN, CNM, OB physician) come with you to the simulated patient's room.

▶ To begin the scenario, read the scenario to the provider and then have them enter the room.

- The scenario should end when the team has done the following:
  - Diagnosed the patient with eclampsia.
  - Administered at least one dose of appropriate antihypertensive medication.
  - Initiated IV magnesium therapy.
  - Administered respiratory support to patient with supplemental O2.
  - Discuss delivery plan once patient is stabilized

<div align="center">OR</div>

  - If 10 minutes have passed and the above steps are not taken during seizure to stabilize patient, simulation should be discontinued.

4.0 Case Scenario:

CASE:
Patient: Courtney Davis

Patient Information:
- The patient is a 36yo G2P1001 at 34w2d presenting for headache and blurry vision. Her medical history is uncomplicated. Her previous pregnancy was complicated by gestational hypertension at 38 weeks, resulting in induction of labor and uncomplicated spontaneous vaginal delivery.
- She has no known drug allergies
- She has been taking Aspirin 81mg daily during pregnancy.

Laboratory Data (on admission):
- Hemoglobin: 12.2 g/dL
- Hematocrit: 36.6 %
- WBC: 12,000 K/uL
- Platelets: 218,000 K/uL
- AST: 22 IU/L,
- ALT: 32 IU/L
- Serum Creatinine: 0.7 mg/dL
- Urine Protein/Creatinine Ratio: pending (this will not become available during the simulation)
- Last ultrasound performed at 32 weeks for advanced maternal age with fetus measuring appropriate for gestational age.

Information includes:
- The patient has an IV line in place with a heplock.
- Initial vital signs taken 15 minutes prior were: BP 145/99, HR 81, RR 18, O2 Sat 98% on room air.
- FHR Tracing (if available): Baseline 140, moderate variability, no accelerations, no decelerations. Tocodynamometer: flat.
- Available medications will depend on what is on the actual unit. The team should be instructed to go and physically obtain any medications or supplies but should be told not to actually open them during the simulation.
- During seizure:
  - Vital signs: 170/105, O2 sat 993 (no changes if supplemental O2 is provided), RR 6, HR 110.

- FHR Tracing: Maintain bradycardia to 80s with minimal variability.
    - After seizure concludes vital signs will depend on whether antihypertensive medications were given. The FHR tracing should slowly recover back to baseline over 5-10 minutes.

Patient Instructions:

Standardized Patient: Person playing role or providing voice for simulator should indicate headache started about 2 hours ago and is severe. About an hour ago, she developed blurry vision. Patient states she "just doesn't feel right."
- At initial assessment, repeat vital signs may be obtained and will remain essentially the same (mild hypertensive range). After this, allow 1-2 minutes for team to discuss initiating anti-hypertensive therapy and magnesium. During this time, standardized patient or simulator should begin seizing in tonic-clonic nature. Seizure should continue for approximately 2 minutes while team repositions patient and administers respiratory support.
- After seizure activity concludes, standardized patient should be disoriented asking "what happened?" Team should address delivery plans with patient and family.

Answers to common questions that come up:
- The urine protein/creatinine ratio results will not return during simulation but is not necessary for diagnostic purposes.
- The FHR tracing will demonstrate fetal bradycardia during the eclamptic seizure and will slowly recover after the seizure ends.
- If asked additional questions, try to redirect and not answer specifics so as not to introduce things that might complicate the scenario (i.e., do not 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 mild HTN range.

Patient should explain symptoms (headache and blurry vision). After brief history is taken she will begin to have an eclamptic seizure.

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OB Provider/team enters room when called and are briefed by OB Nurse
"During seizure" Vital Signs and FHR tracing should be available

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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

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

* The vitals shown will depend on whether or not antihypertensive medications were administered

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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: 145/99
HR: 81 bpm
O2 sat: 98% on RA
RR: 18
VITALS DURING SEIZURE
BP: 170/105
HR: 110 bpm
O2 sat: 93%
RR: 6
VITALS AFTER SEIZURE ENDS
BP: 155/92 (if antihypertensive given) **OR** 179/107 (if no antihypertensives were given)
HR: 100 bpm
O2 sat: 98% on RA
RR: 18

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 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.