

Severe Hypertension in Pregnancy: Case Studies and Lessons Learned

April 17, 2020 Missouri AIM Collaborative Webinar

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Case 1

- 33 yo G4P3003 @ 28w2d with chronic hypertension on labetalol 600 mg TID. The patient presents to the OB office with BP logs concerning for severe range HTN as an outpatient 170s/80s, although her office BP was noted to be 135/80. She has no other symptoms.
- **OBHx:** 3 uncomplicated pregnancies, cesarean section x3
- **PMHX:** Diabetes resolved, recent pregnancy HgbA1C 4.7%
- **PSHX:** Roux-en-Y gastric bypass, 190 lb weight loss 5 years ago

Case 1

- Primary OB calls MFM for consultation and it is recommended the patient present to the hospital for further evaluation for superimposed preeclampsia.
- OB Triage:
 - Vitals: BP 135/80 HR 82 BPM BMI 45 kg/M²
 - Pertinent exam: trace LE edema

Case 1

- Patient admitted for close maternal and fetal surveillance due to significant risk factors for preeclampsia.
- CBC, CMP and 24 hour urine all completed and WNL
- Blood pressure evaluation over the course of 36 hours demonstrated to be within goal 130s-140s/80s-90s on labetalol 600 mg TID.

Case 1

- Upon discussion during consultation patient reveals she has been using her friend's BP cuff on her forearm. She reports she does not have a BP cuff that fits properly.
- Patient undergoes education, her upper arm is measured and orders placed for properly fitting BP cuff.
- Instructions for how to obtain a proper blood pressure are reviewed with the patient.
- RN is asked to review instructions with patient, enthusiastically sharing this was an educational opportunity for her as well. Patient required to demonstrate a self BP check prior to discharge.

Case 1 Lessons Learned

- Make no assumptions: Educate patients and staff
 - Start with fit
 - Move on to accuracy
- THIS IS A NO SHAME GAME!

Case 1 Lessons Learned

Start with the fit

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- Proper fitting cuff: width of bladder 40% of circumference and encircle 80% of arm
 - Too small false elevation, too big falsely low (up to 40 mmHg variation in systolic BP)
 - At rest at least 5 minutes
 - Activity can increase systolic BP by 20 mm Hg
 - Feet flat on ground, back supported, arm at heart level
 - Bare upper arm free of restrictive clothing (try to avoid wrist cuffs)
 - Clothing can affect systolic BP by up to 50 mmHg
 - Check your patients cuff size, have her bring it into the office or hospital
 - When ordering a new cuff, measure arm circumference and include the info

Case 1: Lessons Learned

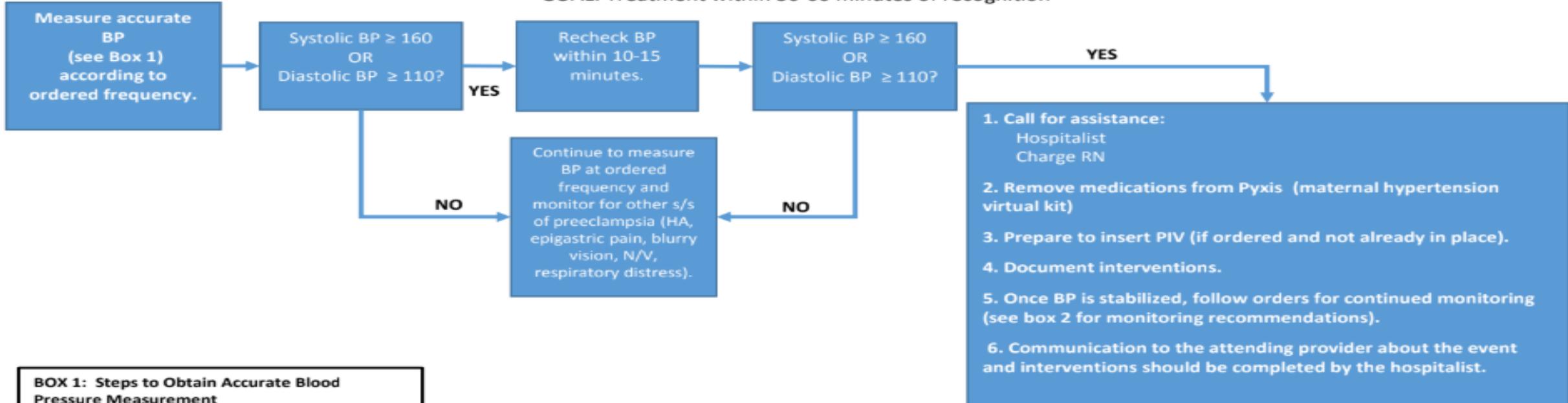
Make no assumptions

- Educate staff on HOW TO obtain an accurate blood pressure, make it a shame- free module, EVERYONE NEEDS A REFRESHER
- We include basics of how to prepare the equipment and prepare the patient on our Maternal Severe Range HTN tool
- OB education days with a BP check station

NO SHAME GAME!!

Maternal Severe Hypertension
Two BP values ≥ 160 systolic OR ≥ 110 diastolic, taken 10-15 minutes apart.

GOAL: Treatment within 30-60 minutes of recognition



BOX 1: Steps to Obtain Accurate Blood Pressure Measurement

Step 1: Prepare Equipment

- A. Mercury sphygmomanometer is considered the gold standard (if available), but validated automated (or manual) equipment can be used
- B. Check cuff for any defects
- C. Correct size cuff: width of bladder 40% of circumference and encircle 80% of arm

Step 2: Prepare the Patient

- A. Sitting or semireclining position with back supported and arm at heart level
- B. Patient to sit quietly for 5 minutes before measurement
- C. Bare upper arm, free of any restrictive clothing
- D. Feet should be flat, not dangling from examination table or bed, and legs uncrossed.

BOX 2: BP monitoring recommendations after treatment

Once BP thresholds are achieved, repeat BP:
Every 5 min x 3
Then every 15 min x 3
Then every 30 min x 1hr
Then every 1 hr x 4 hrs

Case 2

- 30 yo G3P3003 postpartum day #1 has blood pressure on routine postpartum vital signs noted to be 172/105. She is s/p uncomplicated SVD after IOL at 37 weeks for superimposed preeclampsia diagnosed when her blood pressures were noted to escalate. She reports no other symptoms.

Case 2

- **PMHX:** Chronic hypertension x 2 years managed on labetalol 200 mg BID
- **OB HX:** IOL x 2 for preeclampsia at 38-39 weeks, after the birth of her second child her hypertension did not resolve.
- Baseline preeclampsia labs including 24 hour urine protein WNL, normal EKG.
- **Medications:** Labetalol 400 mg BID, prenatal vitamin

Case 2

- RN repeats BP measurement noted to be 165/95
- Patient's labetalol dose is due in 30 minutes, therefore RN decides to administer the dose and not bother the physician with the blood pressure.
- The labetalol dose is given within 15 minutes

Lessons Learned

- Half-life matters not every antihypertensive is appropriate for the treatment of acute severe range hypertension.
- Nursing communication is key

Case 2 Lessons Learned

Half life matters

- Oral nifedipine is an appropriate choice for acute treatment of severe range HTN
 - Half life of labetalol is about 6 hours and will not treat acute severe range HTN in a timely manner
 - Alternative choices would be IV hydralazine or labetalol
 - Include medications in your algorithm
 - Educate nurses and providers on why we use certain medications for acute severe range hypertension and not others.

Maternal Severe Hypertension

Two BP values ≥ 160 systolic OR ≥ 110 diastolic, taken 10-15 minutes apart.

GOAL: Treatment within 30-60 minutes of recognition

Treatment Considerations:

*Intravenous (IV) labetalol and hydralazine have long been considered first line medication for management of acute-onset, severe hypertension in pregnant women and women in the postpartum period.

*Immediate release oral nifedipine also may be considered as a first-line therapy, particularly when IV access is not available.

*The use of IV labetalol, IV hydralazine, or immediate release nifedipine for the treatment of acute-onset, severe hypertension for pregnant or postpartum patients does not require cardiac monitoring.

LABETALOL

Nursing IV Guidelines at MBMC

IV Push by RN: Yes - over 2 minutes

Max dose of 20mg IV every 6 hours.

Higher doses are allowed in the following areas: ICU, CVR, ED, CCL, PACU, PCU, L&D, Interventional Radiology, GI Lab and ACC

IVPB: No

Continuous Infusion: Yes - in ICU, CCL, Interventional Radiology, ED and CVR only

Monitoring:

Single dose: BP, HR every 5 minutes x3, then every 15 minutes x3. **If already on telemetry, notify monitor technician prior to administration.**

Continuous infusions: **Continuous telemetry/cardiac monitoring required for administration. If already on telemetry, notify monitor technician prior to administration.** BP, HR before administration and every 15 minutes x2

Retrieved from Lexicomp (12/20/2018)

Hydralazine

Nursing IV Guidelines at MBMC

IV Push by RN: Yes- maximum dose limit of 20mg IV Push every 6 hours. Higher doses are allowed in the following areas: ICU, CVR, CCL, ED PACU

IVPB: No

Continuous Infusion: No

Monitoring: Observe for orthostatic hypotension. Frequently monitor BP (pressure may fall rapidly following administration).

Following initiation of therapy or dose changes: BP every 5 minutes x3, then every 15 minutes x3.

Maintenance doses: BP before administration and every 15 minutes x2. Prior to administration, contact physician for SBP less than 100 mmHG.

Retrieved from Lexicomp (12/20/2018)

Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. ACOG Committee Opinion No. 767. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2019;133. DOI: 10.1097/AOG.0000000000003075. Epub 2018 December 20

Bernstein, P. S., Martin, J. N., Barton, J. R., Shields, L. E., Druzin, M. L., Scavone, B. M., . . . Menard, M. K. (2017). Consensus Bundle on Severe Hypertension During Pregnancy and the Postpartum Period. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 46(5), 776-787. doi:10.1016/j.jogn.2017.05.003

Case 2 Lessons Learned

Nursing Communication is Key

- If the provider does not know, she/he does not have the opportunity to order the correct therapy.
 - If possible set up a system of care that makes it easy for the nurses at the bedside and get the response that is needed.
 - In our system that means calling the OB hospitalist if there are two persistent severe range BP 10-15 min apart.
 - Despite the above, we continue to have problems with providers not being contacted.

Case 2 Lessons Learned

Nursing communication...Peel back the onion.



Case 2 Lessons Learned

Nursing communication...Peel back the onion.

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- Why are the nurses not contacting the providers?
 - Take a detailed look at the non-compliant cases and look for themes.
 - Misinformation?- solution is education
 - Mis-placed empathy? “I don’t want to bother Dr. ___”- solution is education
 - Fear? “I called Dr. ___ and he told me to recheck in 1 hour and only call him back if BP >180/110, I know she needed treatment, but I didn’t want to question the doctor, he seemed kind of angry that I woke him up.”
 - **Solutions:**
 - Nursing dialogue, escalation protocol and RN leadership support
 - Provider education **AND buy-in**....THE MOST CHALLENGING piece particularly in a largely private practice setting.
 - Set expectations- our hospital expects standard of care for our mothers and babies- set clear guidelines.
 - Try to get administrative support for upholding the guidelines and hold folks accountable-
 - One off conversations and reminders
 - Peer review

Case 3

- 32 yo G2P0101 at 31 and 4/7 weeks gestation presents to her OB office for an NST ordered due to a significant fall in the fetal growth from 65th/oile to the 20th/oile in the context of history of IUGR and rapid onset HELLP syndrome at 30 weeks. She reports to the NST nurse a mild headache since yesterday evening and some slight nausea which improved somewhat after she ate a bagel for breakfast. Her only medication is ASA 81mg daily and she reports to the nurse that her primary OBGYN is managing her very cautiously, she is following BPs at home twice daily which have been normal ranging from 115-135/80s. She denies any RUQ pain, no vomiting, no visual disturbances, no significant swelling. Her baby is active.

Case 3

- Vital signs: BP 130/80 HR 82 BPM
- Labs: Urine dip negative for protein.
- NST: Reactive

Case 3

- The patient's primary OB is out of the office today, but the covering provider requests a 24 hour urine collection and preeclampsia labs out of an abundance of caution given the patient's history.
- The patient is reassured as to normal signs and symptoms of pregnancy, instructed she can take Tylenol for her headache and discharged to home.

Case 3

- At 10pm the covering physician receives a phone call from the patient that her labs had come across the portal and she was worried about the abnormality of her LFTs
- The covering physician was able to access the EMR:
- LFTs 500s, Hgb 10 Plts 80,000 Cr 0.92
- The patient was instructed to proceed immediately to the hospital.

Case 3

- Upon arrival orders were given for the patient to receive magnesium sulfate for both seizure prevention and cerebral palsy prophylaxis.
- Anesthesia consulted
- Betamethasone administered while waiting on repeat labs
- LFTs increased to 700s
- Plts fell to 30,000, Hgb remained stable at 10

Case 3

- Cervix closed long and high.
- After discussion regarding risks/benefits decision was made to proceed with cesarean section under GETA.
- 1 unit plts was administered preoperatively
- Male infant, AGA growth, Apgars 7/9, 6 week uncomplicated stay in NICU, doing well.
- Labs improved immediately postpartum and resolved by POD#3

Case 3: Lessons Learned

- Neurologic(even a headache) or GI symptoms, particularly in the third trimester, are preeclampsia or HELLP until proven otherwise...obtain labs.
- If preeclampsia or HELLP syndrome is a possibility, assess your ability to have labs reported in a timely fashion....(in our system we are able to order STAT labs on anyone being ruled out no matter how low the index of suspicion (TOT 1 hr)).
- **Do not let the absence of urine protein fool you, the absence of protein does NOT exclude preeclampsia or HELLP.**