Improving Care of Hypertension in Pregnancy

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Hypertension in Pregnancy

- Hypertensive disorders are a leading cause of maternal morbidity and mortality

- Most maternal deaths related to hypertensive disorders are judged to have been preventable.

Hypertension in Pregnancy

- Timely management of acute hypertension

- Low-dose aspirin for preeclampsia prevention

- Magnesium sulfate for seizure prophylaxis in sever preecampsia

- Follow-up evaluation/education of patients with hypertension

- SMFM/NICHD/ACOG Cooperative Workshop, 2016

Blood Pressure and Risk of Stroke

- Historically, there has been less emphasis on control of BP to prevent stroke, yet this has been identified as a major knowledge gap. Control of severe HTN is associated with preventing cerebrovascular accidents and reducing SMM associated with preeclampsia.

- The recent publication from CA-PAMR[13] supports the conclusions made by Martin et al. Although these studies are retrospective, BP levels of ≥ 160/110 have been universally adopted as not only diagnostic for severe HTN, but also a clinical trigger requiring emergent antihypertensive therapy in pregnancy and the postpartum period.[14]

- Most maternal deaths (60- 80%) resulting from preeclampsia are a result of hemorrhagic stroke.[9-11]

- Early treatment of HTN has consistently been found to reduce the incidence of hypertensive crisis and SMM.[1] Data from multiple case studies revealed increased rates of heart failure, pulmonary edema, stroke, cerebrovascular hemorrhage, myocardial ischemia, and death when antihypertensive medications were not used in women with severe gestational HTN or preeclampsia with severe features.[2,3]

Hypertensive Emergency in Pregnancy/Postpartum

Applies to all forms of HDP: chronic, gestational, and preeclampsia with or without severe features
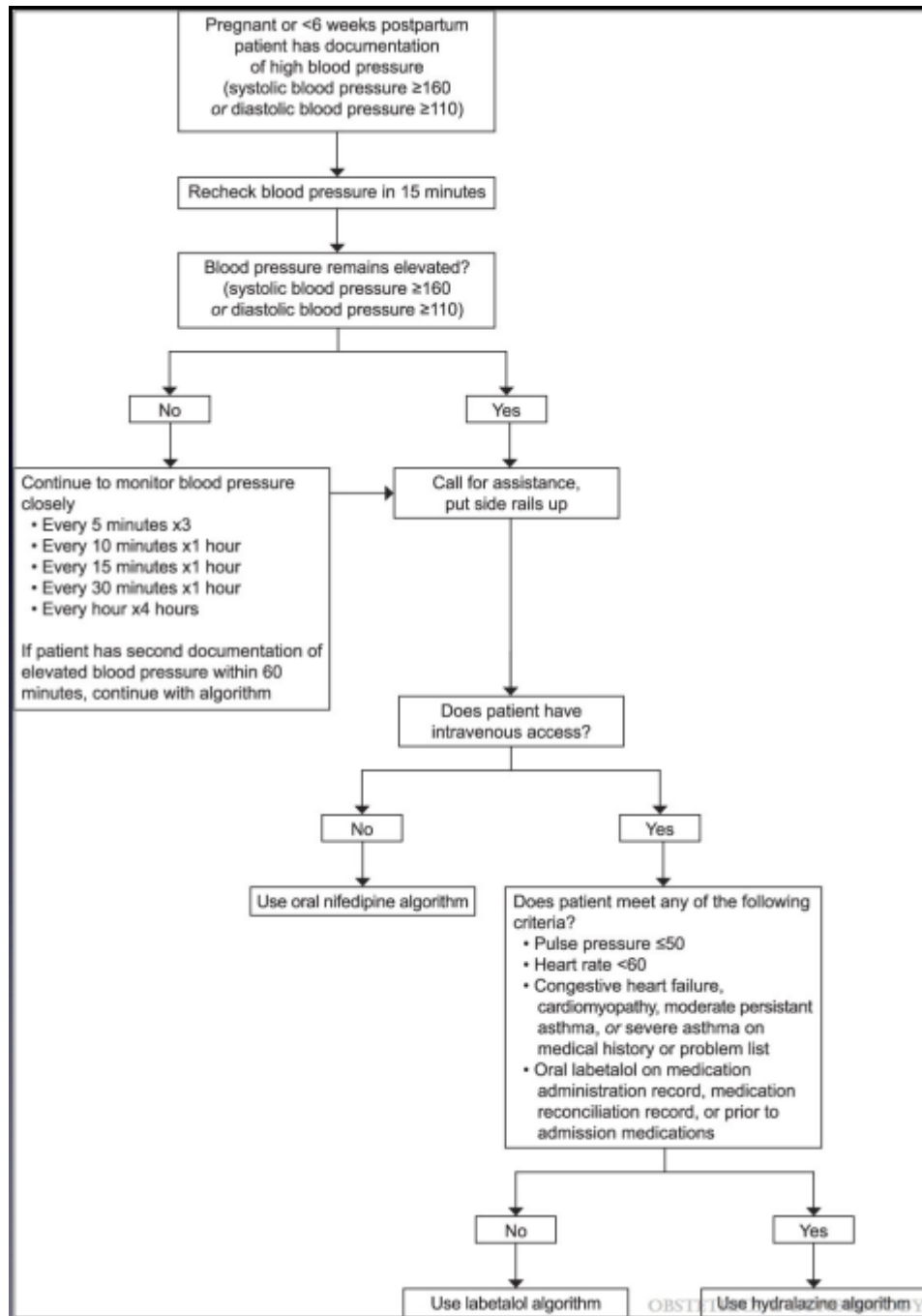
Systolic	Diastolic	Action
≥ 160	≥ 110	Repeat BP within 15 minutes. If BP remains within severe-range - treat within 30-60 minutes (ideally ASAP).

DO NOT WAIT TO TREAT THE HYPERTENSIVE EMERGENCY

Medication Protocols: First Line Agents in Preeclampsia

Medication Agents	Labetalol IV[A]	Hydralazine IV[B,C]	Nifedipine (Immediate release)
Route	IV	IV	PO
Initial therapy	20 mg	5-10 mg	10 mg
Onset[E,F,G]	2-5 minutes	5-20 minutes	5-20 minutes
Peak[E,F,G]	5 minutes	15-30 minutes	30-60 minutes
Max dose[D] (Before switching agents)	140 mg	20 mg	50 mg
Mechanism of action	• Combined α and β-blocking agent • Arteriolar dilator • Decreases heart rate	• Arteriolar dilator	• Calcium channel blocker • Arterial smooth muscle dilator
Side effects	• Use with caution in patients with known asthma • Flushing, light headedness, palpitations and scalp tingling • Safe for use after cocaine and amphetamine use (including methamphetamine)[A]	• Tachycardia, headache[E] • Upper abdominal pain (rare) • Flushing • Nausea[B]	• Reflex tachycardia • Headache • Flushing • Nausea • Vomiting

A: (Richards, Hollander et al. 2017) B: (Raheem, Saaid et al. 2012) C: (Duley, Meher et al. 2013) D: (ACOG 222 2020) E: (Cohan and Checcio 1985) F: (Cheng, Cheng-Lai et al. 2005) G: (Raheem, Saaid et al. 2012)

Acute Treatment Algorithm

Evaluation and Treatment of Antepartum and Postpartum Preeclampsia/Eclampsia

Part 2: Antihypertensive Treatment Algorithm for Hypertensive Emergencies

Target BP: 130-150/80-100 mm Hg

Once BP threshold is achieved:
- Q10 min for 1 hr
- Q15 min for 1 hr
- Q30 min for 1 hr
- Q1hr for 4 hrs

*Intravenous hydralazine or labetalol should be given over 2 minutes. In the presence of sinus bradycardia or a history of asthma, hydralazine or nifedipine are preferred as initial agents. If maternal HR > 110, labetalol is preferred.

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Treatment Recommendations for Sustained Systolic BP ≥ 160 mm Hg or Diastolic BP ≥ 110 mm Hg

*Antihypertensive treatment and magnesium sulfate should be administered simultaneously. If concurrent administration is not possible, antihypertensive treatment should be 1st priority.

*Labetalol IV as Primary Antihypertensive

Initial dose 20 mg labetalol IV

Repeat BP in 10 minutes

SBP ≥ 160 or DBP ≥ 110 Give 40 mg labetalol IV

Repeat BP in 10 minutes

SBP ≥ 160 or DBP ≥ 110 Give 80 mg labetalol IV

Repeat BP in 10 minutes

SBP ≥ 160 or DBP ≥ 110 Give hydralazine 10 mg IV

Repeat BP in 20 minutes

SBP ≥ 160 or DBP ≥ 110

Give hydralazine 10 mg IV *and obtain emergent consultation* from maternal-fetal medicine, anesthesia, internal medicine, or critical care for transfer of care or continuous IV infusion

*Hydralazine IV as Primary Antihypertensive

Initial dose: 5 - 10 mg hydralazine IV

Repeat BP in 20 minutes

SBP ≥ 160 or DBP ≥ 110 Give hydralazine 10 mg IV

Repeat BP in 20 minutes

If SBP ≥ 160 or DBP ≥ 110

Convert to labetalol pathway Give labetalol 20 mg IV per algorithm

Repeat BP in 10 minutes

SBP ≥ 160 or DBP ≥ 110

Give labetalol 40 mg IV *and obtain emergent consultation* from maternal-fetal medicine, anesthesia, internal medicine, or critical care for transfer of care or continuous IV infusion

Nifedipine PO as Primary Antihypertensive

Initial dose: nifedipine 10 mg PO immediate release

Repeat BP in 20 minutes

SBP ≥ 160 or DBP ≥ 110 Give nifedipine 20 mg PO

Repeat BP in 20 minutes

SBP ≥ 160 or DBP ≥ 110 Give nifedipine 20 mg PO

Repeat BP in 20 minutes

SBP ≥ 160 or DBP ≥ 110

Convert to labetalol 20 mg IV pathway *and obtain emergent consultation* from maternal-fetal medicine, internal medicine, anesthesia or critical care for transfer of care or continuous IV infusion

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Pregnant or <6 weeks postpartum patient has documentation of high blood pressure (systolic blood pressure ≥160 or diastolic blood pressure ≥110)

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Recheck blood pressure in 15 minutes

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Blood pressure remains elevated? (systolic blood pressure ≥160 or diastolic blood pressure ≥110)

No → Continue to monitor blood pressure closely
- Every 5 minutes x3
- Every 10 minutes x1 hour
- Every 15 minutes x1 hour
- Every 30 minutes x1 hour
- Every hour x4 hours

If patient has second documentation of elevated blood pressure within 60 minutes, continue with algorithm

Yes → Call for assistance, put side rails up

↓

Does patient have intravenous access?

No → Use oral nifedipine algorithm

Yes → Does patient meet any of the following criteria?
- Pulse pressure ≤50
- Heart rate <60
- Congestive heart failure, cardiomyopathy, moderate persistant asthma, or severe asthma on medical history or problem list
- Oral labetalol on medication administration record, medication reconciliation record, or prior to admission medications

No → Use labetalol algorithm

Yes → Use hydralazine algorithm

Postpartum Hypertension

- Improvement needed in follow-up evaluation and education of patients with gestational hypertension/preeclampsia

- ACOG recommends that pateints with sever hypertension during their hospitalization be seen within 72 hours after discharge.

  - SMFM Special Statement, 2022

Barriers to 72-hour follow up

- Discharge at the end of the week
- Lack of availability of outpatient appointments
- Patient-related issues (lack of transportation and/or childcare)

Postpartum Hypertension

- Provide card to patients on discharge with warning symptoms and instruction for follow up

- Implement hospital-based program for blood pressure assessment and follow (likely in OBED)

Postpartum hypertension – future

- Provide patients with ambulatory blood pressure monitors
- Develop text-messaging system to remind patients to check blod pressure and to follow up
- Provide option of telemedicine visit for 72-hour follow up

Postpartum Hypertension

- Evaluation of postpartum patients with hypertension in the ED associated with significant delays in:
  - ➢ Initial evaluation
  - ➢ Notification of OB team
  - ➢ Timely treatment of acute hypertension
  - ➢ Initiation of magnesium sulfate for seizure prophylaxis

All patients withn 6 weeks postpartum with possible complications of delivery should be seen in OBED and evaluated by the OB hospitalists (or patient's OB)

VBMC Ob/Gyn Department, effective (insert date)

Take-home messages

- Utilize OB Hypertension protocol early and often, with goal that severe hypertension be treated within one hour

- Ensure that patients with sever hypertension receive follow up within 72 hours of discharge

- Encourage patients to go to OBED for obstetric complaints

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