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CRITICAL CONDITIONS IN OBSTETRICS: HYPERTENSIVE DISORDERS, SEPSIS, AND SUDDEN MATERNAL COLLAPSE

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Abstract: Critical obstetric conditions are characterized by rapid deterioration of vital functions and require the simultaneous achievement of two priorities: maternal stabilization and minimization of fetal risk. The most common "entry points" include severe arterial hypertension with seizures, infectious–septic complications, acute respiratory/hemodynamic collapse (including amniotic fluid embolism), anaphylaxis, and cardiac arrest. Despite diverse etiologies, successful care relies on a unified framework: early recognition based on "red flags," coordinated team response, the ABCDE approach, and protocol-driven escalation of therapy.

Keywords: preeclampsia; eclampsia; hypertensive crisis; obstetric sepsis; amniotic fluid embolism; anaphylaxis; cardiac arrest; perimortem cesarean delivery

Introduction

Pregnancy and childbirth are accompanied by physiological changes in hemodynamics, respiration, and hemostasis that can mask early signs of deterioration. Therefore, when severe hypertension, fever, dyspnea, altered mental status, bleeding, or shock is suspected, management should follow the principle "stabilize first, then refine the cause." Most contemporary guidelines emphasize the role of a multidisciplinary team, simulation training, and readiness for rapid transfer to the operating room or intensive care unit (ICU).

Materials and Methods

This article synthesizes key elements of international recommendations for the management of severe hypertension and preeclampsia (ACOG Practice Bulletin No. 222, 2020), sepsis (Surviving Sepsis Campaign, 2021), and maternal resuscitation (American Heart Association algorithm "Cardiac Arrest in Pregnancy," 2020). Practical pathways were aligned with local emergency obstetric care protocols (blood pressure thresholds, first-line antihypertensive regimens, magnesium sulfate administration, the sepsis assessment and treatment "bundle," clinical features of amniotic fluid embolism, epinephrine dosing principles for anaphylaxis, and pregnancy-specific CPR modifications).

Results and Discussion

Severe hypertension, preeclampsia and eclampsia. Severe-range blood pressure is commonly defined as systolic blood pressure ≥160 mmHg and/or diastolic blood pressure ≥110 mmHg confirmed on repeat measurement within a short interval. The clinical goal is to reduce blood pressure to a safer range to prevent cerebrovascular complications while maintaining uteroplacental perfusion.

First-line antihypertensive therapy includes intravenous labetalol (bolus dosing) or oral immediate-release nifedipine. In refractory cases, continuous infusions (e.g., nicardipine or short-acting beta-blockers such as esmolol) may be used in an ICU setting with continuous monitoring. Sodium nitroprusside may be considered as a last-resort option in imminently life-threatening situations under strict monitoring.

Seizure prophylaxis and treatment rely on magnesium sulfate. A commonly used regimen is a loading dose of 4–6 g IV over 15–20 minutes, followed by a maintenance infusion of 1–2 g/hour with clinical monitoring for toxicity (respiratory rate, deep tendon reflexes, urine output).

Obstetric sepsis. Sepsis should be suspected when signs of infection are accompanied by systemic dysfunction: hypo-/hyperthermia, tachycardia, tachypnea, hypotension, hypoxemia, oliguria, altered mental status, or cold/clammy skin. The priority is immediate team activation and initiation of a diagnostic-and-treatment protocol. Recommended early actions include serum lactate measurement, obtaining blood cultures (and other specimens when feasible) prior to antibiotics, early broad-spectrum antibiotics, and fluid resuscitation. The Surviving Sepsis Campaign (2021) recommends administering at least 30 mL/kg of crystalloids within the first 3 hours for hypotension or lactate ≥4 mmol/L; if hypotension persists, vasopressors should be started to maintain mean arterial pressure (MAP) ≥65 mmHg. In obstetrics, prompt source assessment and source control (e.g., endometritis, urinary tract infection, post-cesarean complications, thrombophlebitis, mastitis) are essential and may require surgical consultation.

Sudden maternal collapse and amniotic fluid embolism (AFE). AFE is rare but catastrophic and typically occurs during labor or shortly after delivery. A classic clinical triad includes sudden hypoxemia, hypotension/collapse, and a consumptive coagulopathy (DIC). In practice, diagnosis is clinical; research definitions propose standardized criteria (e.g., Clark et al., 2016). Management is supportive: high-flow oxygen and ventilatory support as needed, vasopressor support, early correction of coagulopathy (including fibrinogen replacement and blood components), readiness for advanced resuscitation, and urgent operative delivery when indicated.

Anaphylaxis. Obstetric anaphylaxis may be triggered by medications (antibiotics, anesthetics), latex, or other agents. The first-line treatment is epinephrine with rapid airway management and aggressive fluid resuscitation. Additional therapies include inhaled beta2-agonists for bronchospasm, antihistamines and corticosteroids as adjuncts. Delays should be avoided while awaiting laboratory confirmation.

Maternal cardiac arrest and perimortem cesarean delivery. High-quality CPR and relief of aortocaval compression are essential. Manual left uterine displacement is recommended, along with early advanced airway management when feasible. AHA guidance emphasizes that the purpose of perimortem (resuscitative) cesarean delivery is to improve both maternal and fetal outcomes; the ideal target is to begin incision by 4 minutes and achieve fetal delivery by 5 minutes if return of spontaneous circulation (ROSC) has not occurred. When the uterine fundus is at or above the umbilicus, resuscitative hysterotomy should be considered as a life-saving procedure performed in parallel with ongoing chest compressions.

ABCDE framework (core actions). A—Airway: assess patency; prepare intubation for depressed consciousness or progressive respiratory failure. B—Breathing: monitor SpO2 and respiratory rate; administer 100% oxygen; consider non-invasive ventilation or intubation/ventilation as indicated. C—Circulation: continuous ECG; obtain two IV lines; collect blood tests; administer crystalloids; start vasopressors when indicated. D—Disability: assess consciousness; treat seizures (magnesium sulfate when appropriate); check glucose. E—Exposure: assess temperature, bleeding, and infectious foci; bedside ultrasound; fetal assessment. Within the first hour of suspected sepsis, implement a structured bundle (lactate, cultures, antibiotics, fluids/vasopressors as indicated, urine output monitoring, and timely preparation for operative management when necessary).

Table 1. Rapid antihypertensive regimens for severe hypertension in pregnancy and postpartum

Drug	Starting regimen	Monitoring / notes

Nifedipine (immediate-release, oral)	10–20 mg PO; reassess after 20 min; repeat if needed per protocol	Monitor BP and heart rate; avoid excessive BP reduction.
Labetalol (IV bolus)	20 mg IV; reassess after 10–20 min; titrate per protocol	Consider anesthesia input; avoid in bronchospasm or AV block.
Nicardipine (IV infusion, ICU)	5–15 mg/h (titrate)	Continuous monitoring; risk of tachycardia.
Esmolol (IV infusion, ICU)	0.05–0.30 mg/kg/min (titrate)	Short-acting; monitor heart rate and BP.
Sodium nitroprusside (reserve)	0.1–1.0 µg/kg/min	Only in life-threatening situations under strict monitoring.

Practical Recommendations

- Maintain team readiness: predefined roles, first-line medications available at the bedside, and checklists in delivery units.
- For severe hypertension (≥160/110 mmHg), start antihypertensive therapy without delay and provide seizure prophylaxis/treatment with magnesium sulfate when indicated.
- When sepsis is suspected, implement a "one-hour bundle": measure lactate, obtain cultures, administer early broad-spectrum antibiotics, provide crystalloids (30 mL/kg for hypotension or lactate ≥4 mmol/L), and start vasopressors if needed to maintain MAP ≥65 mmHg.
- In sudden collapse during labor or postpartum, consider AFE in the differential and initiate supportive therapy with early correction of coagulopathy.
- In anaphylaxis, epinephrine and airway management are first-line; do not delay treatment while awaiting tests.
- In maternal cardiac arrest, perform high-quality CPR with left uterine displacement and prepare for resuscitative cesarean delivery if ROSC is not achieved rapidly and gestational age is viable.
- Implement regular simulation training and case review (audit) to reduce time-to-intervention for critical obstetric events.

Conclusion

Critical conditions in obstetrics require a unified, team-based response. The combination of the ABCDE approach, threshold-based triggers for immediate treatment (blood pressure, lactate, respiratory compromise, shock signs), and preparedness for operative interventions forms the foundation of safe maternity care. System-level measures—standardization, training, and continuous audit—are as important as individual pharmacologic interventions.

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