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REVIEW ARTTICLE:

ANESTHETIC MANAGEMENT FOR HIGH RISK OBSTETRIC EMERGENCIES

By

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INTRODUCTION

Pregnancy and parturition are considered "high risk" when accompanied by conditions unfavorable to the well-being of the mother, the fetus, or both. Maternal problems may be related to pregnancy such as preeclampsia-eclampsia and other hypertensive disorders of pregnancy, or antepartum hemorrhage resulting from placenta previa or abruption placentae. Diabetes mellitus, cardiac, chronic renal, neurologic, or sickle cell disease and asthma, obesity, and drug abuse are not related to pregnancy but are often affected by it. Advanced maternal age (AMA) is associated with an increased risk of maternal and fetal complications. Prematurity (gestation of <37 weeks), postmaturity (≥42 weeks), intrauterine growth retardation, and multiple gestation are fetal conditions associated with risk. During labor and delivery, fetal malpresentation (breech, transverse lie), placental abruption, compression of the umbilical cord (prolapse, nuchal cord), precipitous labor, or intrauterine infection (prolonged rupture of membranes) may increase the risk to the mother or the fetus **(Braveman et al., 2013).**

Anesthetic management of high risk pregnant female is based on the considerations as in healthy mother or fetus which would include maintenance of maternal cardiovascular function and oxygenation improving utero-placental blood flow and delivery of an infant without significant drug effect **(Arendt, 2016).**

Anesthesiologists often contribute to the care of obstetric patients at high risk in the peripartum period. The anesthetic issues involved in caring for woman at high risk with diseases or conditions unrelated to their pregnancy that complicate their obstetric or their obstetric anesthesia care. Appropriate anesthetic management can assist in the obstetric management of these women. Antepartum consultation between the obstetrician, anesthesiologist, and specialist managing the pregnant woman's chronic condition will help assure the best outcome possible for both the mother and her child(ren) **(Sunanda and Seema, 2016).**

Maternal hemorrhage

Hemorrhagic complications can arise at almost any point during pregnancy, labor, and delivery, quickly turning an uneventful pregnancy into an emergent

situation requiring prompt aggressive treatment to ensure the health and wellbeing of mother and infant **(Arendt, 2016).**

Postpartum hemorrhage (PPH) is a potentially life-threatening albeit preventable condition that persists as a leading cause of maternal death. Identi?cation of safe and cost-effective hemostatic treatment options remains crucial as a supplement to surgery and uterotonic agents **(Ekelund et al., 2015).**

PPH requires early recognition, immediate control of the bleeding (including medical, mechanical and surgical interventions), rapid stabilization of the patient, and early activation and involvement of multi-professional and multi-disciplinary clinical management **(Kozek-Langenecker et al., 2013).**

Uncontrolled bleeding is a life-threatening condition and requires emergency intervention due to hemodynamic instability. Based on a extrapolation of knowledge from trauma management to the PPH situation, and before transfusing packed red blood cells (PRBCs**) (De Lange et al., 2014).**

The initial treatment of uncontrolled PPH is often administration of intravenous ?uids (crystalloids or colloids), since anemia is better tolerated than hypovolemia, regardless of the cause of ?uid loss. Crystalloids are often the preferred choice since colloids may induce coagulopathy and hypocoagulability. Likewise, infusion of excessive amounts may increase hemorrhage and mortality due to the so-called "dilutional coagulopathy" **(Ekelund et al., 2014).**

Transfusion with O Rh (D) negative blood must be prioritized, prior to obtaining the initial hemoglobin count, or other standard laboratory tests. Transfusion of PRBC(Packed red blood cell), Fresh frozen plasma (FFP) and platelets should follow a transfusion protocol in accordance with national or international transfusion guidelines **(Stensballe et al., 2014).**

Peripartum hemorrhage should be manged by multidisciplinary team. An escalating management protocole including uteritonic drug, surgical and/or endovascular interventions, and procoagulant drugs should be available **(Rossaint et al., 2016).**

- Risk awareness and early recognition of severe hemorrhage are essential.
- Patients with known placenta accreta are treated by multidisciplinary care teams.
- Cell salvage is well tolerated in obstetric settings, provided that precautions are taken against rhesus isoimmunisation.
- Using perioperative cell salvage during cesarean section may decrease postoperative homologous transfusion and reduce hospital stay.
- Moderate(<9.5g/dl) to severe (<8.5g/dl) postpartum anemia be treated with intravenous iron rather than oral therapy.

Intravenous iron supplementation improves fatigue at 4, 8 and 12 weeks postpartum.

● Treatment with erythropoietin may correct anemia more rapidly than treatment with folic acid and iron.

● Fibrinogen concentration in parturients with bleeding should be assessed as concentrations <2gm/l may identify those at risk of severe PPH.

● Platelet count <100 x 109/l at the onset of labor, particularly combined with plasma ?brinogen concentration <2.9g/l, may indicate an increased risk of PPH.

● Thromboelastometry (ROTEM) can identify obstetric coagulopathy nd hyper?brinolysis and guide hemostatic therapy.

● In life-threatening PPH. Transfusion protocol is applied with a ?xed product ratio or individualised procoagulant intervention and factor substitution.

● Administration of tranexamic acid in obstetric bleeding to reduce blood loss, bleeding duration and the number of units transfused.

● Recombinant activated factor VII (rFVIIa) should only be considered as a last line therapy because of its thromboembolic risk.

● Fibrinogen concentration and number of platelets should be optimized befor administration of rFV11a **(Rossaint et al., 2016).**

Hypertension during pregnancy

Hypertension during pregnancy can be classified into four categories as pregnancy- induced hypertension (PIH, often also referred to as pre-eclampsia-eclampsia), chronic hypertension that preceded pregnancy (of any cause), chronic hypertension with superimposed pre- eclampsia and gestational hyper-tension **(Olson-Chen and Seligman., 2016).**

Complications of hypertension are the third leading cause of pregnancy-related deaths, superseded only by hemorrhage and embolism **(Clyburn et al., 2013).**

Obstetric Management of Severe Pre-Eclamapsia and Eclampsia

Obstetric management of patients with preeclampsia depends on the individual clinical situation, and can change abruptly. There is a high rate of cesarean sections in patients with pre-eclampsia. General anesthesia or regional anesthesia are used and can be considered compar-able and equally useful. The application of regional anesthesia is preferred. if the initial criteria, such as normal neuro-logical status and blood coagulation, are fulfilled (**Van Gelder et al., 2015).**

Factors used to determine obstetric management include

- Severity of the hypertension
- Presence of complications such as thrombocytopenia and oliguria
- Fetal condition.

Conservative management involves controlling hypertension in the outpatient setting, with the goal of vaginal delivery nearer to term. With more severe cases, inpatient control is required, using IV antihypertensives and seizure prophylaxis (magnesium is used for seizure prophylaxis in the United States, while benzodiazepines and barbiturates are more often used outside the United States). If preeclampsia cannot be controlled, or if

fetal distress occurs in spite of medical management, cesarean delivery may be the best option to ensure well-being of both the mother and fetus **(Braveman et al., 2013).**

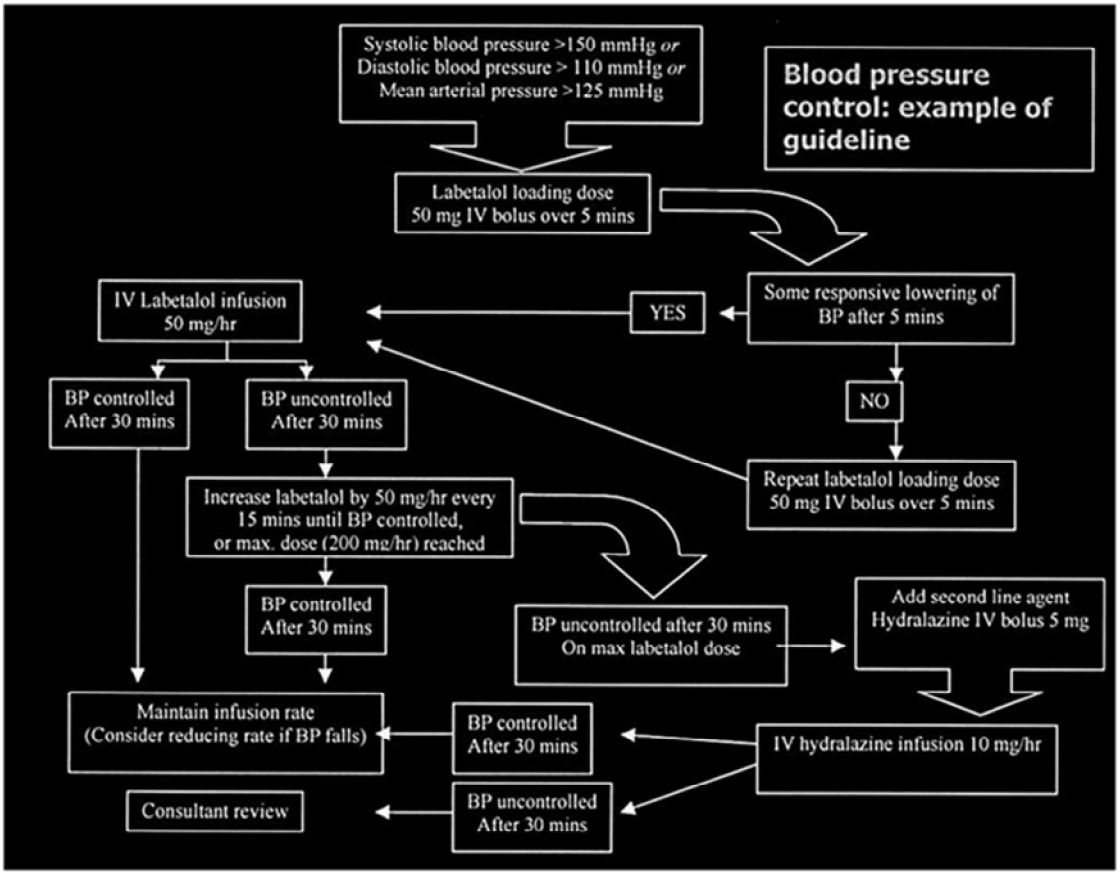

Figure (1): Blood pressure control in severe pre-eclampsia and eclampsia . Bateman B ., et al. American Journal Of Obstetric and Gynecology.(2014) 212: 337.e1-14.

Treatment Of Eclamptic Fits

1) Initial treatment follows the basic principles, i.e airway, breathing and circulation.
2) IV access should be obtained.
3) 4 gm magnesium sulphate is used to control the seizure. For recurrent seizures a further 2gm bolus of magnesium is given and the maintenance increased to 20mg/hr (2g/hr).
4) It should also be ascertained that the patient has not aspirated during an unwitnessed convulsion, chest X-ray may be indicated.
5) Ante-partum, a fit is often accompanied by a fetal bradycardia (due to maternal hypoxia)- the primary concern is the wellbeing of the mother. Adequate resuscitation and stabilization of maternal condition will resuscitate the fetus **(Van Gelder et al., 2015).**

Preoperative Assessment of Patients with Hypertension And Pre-Eclampsia

● An accurate clinical assessment of patients with hypertension and/or pre-eclampsia is essential as the clinical course, and subsequent management, is different for women with pregnancy-induced hypertension, pre-eclampsia and severe preeclampsia **(Prin et al., 2015).**

● Assessment (Magee et al., 2014).

1. Frequent blood pressure determinations.
2. Fundus examination.
3. Neurologic examination for knee reflex.
4. Fetal monitoring.
5. Blood studies: CBC, electrolytes, Mg level clotting studies (P.T, APTT, platelets, fibrinogen and fibrin- spilt products).
6. Urine protein, creatinine clearance.
7. Renal and liver function.
8. Central venous pressure(CVP): indicated when diastolic pressure > 105 mmHg or oliguria; patients reciving magnesium sulphate and antihypertensive.
9. Urine output.
10. ECG.
11. Magnesium level every 2 hours.
12. Continuous fetal heart rate monitoring (Bateman et al., 2014).

Management of Pre-Eclampsia and Pregnancy-Induced hypertension (Bateman et al., 2014):

The main aims of management are

● To ensure survival of the mother with minimal morbidity.

● To ensure that the fetus is delivered as close to term possible.

Important aspects in the management of pre-eclampsia are (Magee et al., 2014):

● Blood pressure control.

● Prevention of eclamptic fits.

● Fluid balance.

● Delivery of the fetus.

● Effective postpartum care.

● Management of complications, e.g. eclampsia / HELLP syndrom .

Anesthetic Options:

An aggressive approach to providing regional anesthesia in patients presenting with severe preeclampsia should always be considered in an attempt to reduce overall risk **(Nelson and D'Angelo, 2015).**

The following recommendations are relevant when general anesthesia cannot be avoided

■ Two anesthesia providers should be present if at all possible.

■ Thoroughly preoxygenate/denitrogenate with a tight mask seal whenever possible, as ?ve minutes of tidal volume breathing offers a greater safety margin over ?ve vital capacity breaths alone (Ankichetty et al., 2013).

■ Prevent hypertension during laryngoscopy and intubation to reduce potential complications such as pulmonary edema and intracranial hemorrhage.

■ Consideration should be given to use of higher than normal doses of induction agent (i.e, sodium pentothal up to 7 mg/kg) (Sumikura et al., 2015).

■ Pharmacologic agents which may be used prior to airway manipulation in

addition to standard rapid sequence induction agents include:

- Hydralazine: at least 20 min prior to induction
- Labetalol: at least 10 min prior to induction
- Esmolol: up to 2 mg/kg bolus immediately prior to induction
- Nitroglycerine: 50–100 mcg boluses immediately prior to and during induction as needed
- Sodium nitroprusside: infusion initiated at 0.5 mcg/kg/min prior to induction and titrated to effect
- Fentanyl: 100–150 mcg bolus immediately prior to induction
- Remifentanil: 1 mcg/kg bolus immediately prior to induction
- Lidocaine: 100 mg during induction (Braveman et al., 2013).

In severely pre-eclamptic parturient, niefdipine was associated with lowering of maternal blood pressure as well as prolongation of pregnancy and improvement of fetal oxygenation. However, cardiovascular collapse has been reported after use of nifedipine in presence of magnesium sulfate **(Datta, 2013).**

Intravenous narcotics have also been used preoperatively to prevent reflex hypertension. It was proved that giving 200mg of fentanyl and 5mg of droperidol intravenously prior to induction of general anesthesia produces great success **(Dahan et al., 2013).**

Summary of General Anesthesia for Cesarean Section In Pre-Eclamptic Patients (Datta, 2013):

Patients with severe preeclampsia usually have multisystem involvement, and are at increased risk for signi?cant obstetric and anesthetic complications. Anesthetic risks can be reduced by:

- Assessing platelet count when appropriate
- Early epidural catheter placement whenever possible
- Utilizing spinal anesthesia for urgent cesarean section when preexisting catheter is not present.
- Reserving for general anesthesia when regional anesthesia is contraindicated
- Controlling blood pressure, especially during general anesthesia
- Preparing for dif?cult airway management.
- Monitor the pulse and blood pressure, ECG, O2 saturation, PCO2, temperature, neuromuscular block, CVP, and pulmonary artery lines, if necessary.
- Nonparticulate antacid and metoclopramide should be used cautiously.
- Drugs should be used to counter hypertension during induction and extubation, if necessary.

HELLP syndrome (hemolysis, elevated liver enzymes, low platelets) is an obstetric complication with heterogonous presentation and multisystemic involvement. It is characterized by microangiopathic hemolytic anemia, elevated liver enzymes by intravascular breakdown of ?brin in hepatic sinusoids and reduction of platelet circulation by its increased consumption **(Vellosillo and Medina, 2016).**

HELLP syndrome is a severe variant of preeclampsia whose pathogenesis remains unclear. Recent evidence and clinical similarities suggest a link to atypical hemolytic uremic syndrome (aHUS) **(Vaught et al., 2016).** Its incidence is between 2–12% of all pregnancies, and in 10–20% of cases of pre-eclampsia. It occurs during 70% of antepartum periods and during 30% of postpartum periods, and emerges mostly in the ?rst 48 h (Vellosillo and Medina, 2016). The risk of recurrence in a subsequent pregnancy is estimated at 19-27% **(Magee et al., 2014).**

For classic HELLP syndrome, the Tennessee and Mississippi classifications propose clinical criteria using platelet count, lactate dehydrogenase (LDH) levels, bilirubin and aspartate aminotrans-ferase (AST) with or without alanine aminotransferase (ALT) levels to establish the diagnosis **(Vaught et al., 2016).** It is frequently associated with severe preeclampsia or eclampsia, but can also be diagnosed in the absence of these disorders or mild in up to 50% of patients **(Prin et al., 2015).**

HELLP syndrome may result in severe morbidity and mortality to both the mother and fetus. Disseminated intravascular coagulopathy (DIC) is the most frequent severe maternal complication followed by hepatic rupture and bleeding. Delivery is the treatment of choice. but preterm delivery may have severe consequences to the neonate (**Vaught et al., 2016).**

Differential Diagnosis

The differential diagnosis of HELLP includes acute fatty liver of pregnancy, gallbladder disease, lupus flare, and thrombotic thrombocytopenic purpura/ hemolytic uremic syndrome. HELLP syndrome (SH) can be differentiated from these other conditions based on normal ammonia levels, mild renal insufficiency, anemia, and presence of hypertension and proteinuria **(Olson-Chen and Seligman, 2016).**

Anesthetic Management

1) The induction of delivery is the only specific therapy in HELLP syndrome **(Vaught et al., 2016).**
2) If no obstetric complications are present, vaginal delivery is preferred.
3) Delivery by cesarean section is required in 60% of cases.
4) In the case of cesarean section, epidural anesthesia can be recommended when the thrombocyte count is higher than 100.000/mm3, when there are no coagulation disorders and the bleeding time is normal (**Magee et al., 2014**).
5) The choice of regional or general anesthesia is influenced by the condition of the parturient and the fetus.
6) Selection of drugs is influenced by the presence of liver or renal failure that could alter drug clearance.
7) Blood glucose concentration may be monitored to avoid hyperglycemia in women with HELLP syndrome **(Bateman et al., 2014**).

Embolic Disorder during Pregnancy

Pulmonary Thromboembolism

Normal physiological changes of pregnancy (including increased clotting factors and altered venous compliance) increase the risk of deep venous

thrombosis. This translates into propensity for pulmonary emboli during pregnancy. Additional risk factors include age >35, cesarean section, bed rest and obesity (**Prin et al., 2015).** Recognition of risk factors and early postoperative ambulation are important prophylactic measures (**Prin et al., 2015**).

Management of pulmonary embolism in late pregnancy and labor

Patients presenting with pulmonary embolism in pregnancy should be treated with supplemental oxygen (to achieve an oxygen saturation of >95%) and intravenous heparin,and should be transferred to a major medical center that has a maternal-fetal, neonatal, and cardiothoracic unit for high-risk patients. In hemodynamically stable patients, a temporary vena caval filter should be placed the diagnosis has been confirmed **(Butwick, 2012).**

The care of the pregnant patient who has massive pulmonary embolism either at term or when suspicion of compromised fetal status would call for expeditious cesarean delivery is complex. It requires a coordination treatment strategy by the obstetrician, intensives, cardiothoracic surgeon, anesthesiologist, and interventional radiologist. The approach to the management of a massive pulmonary embolism should be individualized and adapted to changing circumstances.It could include cardiopulmonary bypass with surgical embolectomy followed by cesarean section or percutaneous mechanical clot fragmentation and placement of an inferior vena caval filter. Although thrombolytic therapy is considered to be contraindicated, successful outcomes with the use of thrombolytic therapy during labor have been reported **(Bilger et al., 2014).**

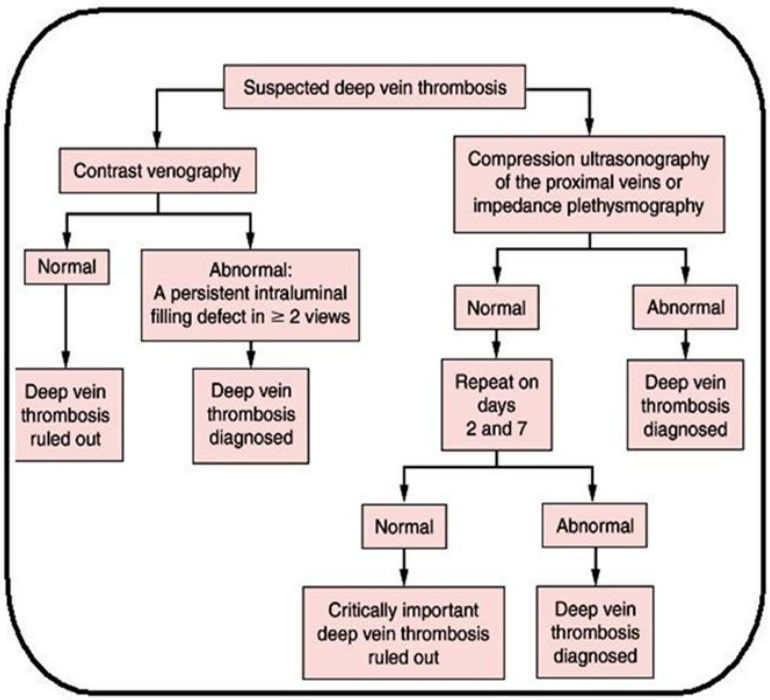

Figure (2): Diagnosis of venous thromboembolism. Morgan .E.S, E .Wilson, et al., Maternal obesity and venous thromboembolism., International J of Obst Anesthesia(2012) 21, 253-263.

Special Considerations with Neuraxial Blockade (Varma, 2016):

The American Society of Regional Anesthesia (ASRA) has the following recommendations when neuraxial blockade is needed for patients receiving antiplatelet or anticoagulant therapy:

- Neuraxial blockade and indwelling catheters are safe in patients on aspirin.
- NSAIDs alone do not significantly increase the risk of spinal hematoma.
- COX-2 inhibitors do not cause platelet dysfunction .
- Coadministration of antiplatelet and anticoagulant medications is contrain-dicated with indwelling epidural catheters. Clopidogrel must be discontinued for 7 days before neuraxial blockade.
- Spinal or epidural anesthesia is performed at least 12 hours after the last thromboprophylaxis dose of LMWH (enoxaparin 40 mg SC daily) or dalteparin (5, 000 U units once daily), and at least 24 hours after the last full dose of LMWH (e.g. enoxaparin 1 mg/kg /12h, enoxaparin 1.5 mg/kg /24h, or dalteparin 120 U/kg /12h).
- In general, an epidural catheter should not be removed until 12 hours after the last prophylaxis dose of LMWH.
- The first dose of LMWH should be administered no sooner than 2 hours after catheter removal.
- If a single daily thromboprophylaxis dose of LMWH is administered, indwelling catheters may be maintained postoperatively.
- Concurrent use of twice-daily or therapeutic LMWH and an indwelling epidural catheter is not recommended.
- The LMWH dose is delayed for 24 hours if the patient experienced excessive trauma during attempted epidural or spinal anesthesia.
- Neuraxial blocks should not be performed in patients chronically taking warfarin unless the warfarin is stopped and the INR is normal.
- Neuraxial catheters should be removed only when the INR is <1.5.
- For patients receiving an initial dose of warfarin prior to surgery, the INR should be checked if the dose was given >24 hours earlier or a second dose has been administered.
- Newer anticoagulants such as thrombin inhibitors and fondaparinux are unknown risks due to a paucity of data and experience. Avoidance of indwelling catheters is recommended.

Amniotic fluid embolism (AFE)

Amniotic fluid embolism is a rare catastrophic and life-threatening complication of pregnancy that occurs in the setting of a disruption in barrier between the amniotic fluid and maternal circulation. The three most common sites for entry of amniotic fluid into the maternal circulation are the endocervical veins, the placenta, and a uterine trauma site. Multiparous parturients are at increased risk of amniotic fluid embolism **(Sadera and Vasudevan, 2015).**

Signs and Symptoms: The onset of the signs and symptoms of amniotic fluid embolism are dramatic and abrupt, classically manifesting as dyspnea, arterial

hypoxemia, cyanosis, seizures, loss of consciousness, and hypotension that is disproportionate to the blood loss. Fetal distress is present at the same time. More than 80% of these parturients experience cardiopulmonary arrest. Coagulopathy resembling DIC with associated bleeding is common and may be the only presenting symptom (**Sadera and Vasudevan, 2015).**

Diagnosis: The diagnosis of amniotic fluid embolism is based on clinical signs and symptoms. These include increased pulmonary artery pressures and decreased cardiac output as determined by measurements from invasive monitors, and ultimately confirmation of amniotic fluid material in the parturient's blood aspirated from a central venous or pulmonary artery catheter **(Sadera and Vasudevan, 2015).**

Treatment: Treatment of amniotic fluid embolism includes tracheal intubation and mechanical ventilation lungs with 100% oxygen, inotropic support as guided by central venous or pulmonary artery catheter monitoring, and correction of coagulopathy. Positive end-expiratory pressure is often helpful for improving oxygenation. Dopamine, dobutamine, and norepinephrine have been recommended as inotropes to treat acute left ventricular dysfunction and associated hypotension. Fluid therapy is guided by central venous pressure monitoring, keeping in mind that these patients are vulnerable to developing pulmonary edema. Treatment of DIC may include administration of fresh frozen plasma, cryoprecipitate, and platelets. Even with immediate and aggressive treatment, mortality due to amniotic fluid embolism remains higher than 80% **(Sadera and Vasudevan, 2015).**

Maternal arrest:

Maternal cardiac arrest during pregnancy challenges health care teams with the simultaneous care of two critically ill patients, mother and unborn baby. These challenges are superimposed upon a general lack of experience in maternal resuscitative measures by obstetric health care team because cardiac arrest in pregnancy is estimated to occur in < 1:20, 000 women (**Lipman et al., 2014).**

The most common causes of maternal cardiac arrest are hemorrhage, cardiovascular disease (including myocardial infarction, aortic dissection, and myocarditis), amniotic fluid embolism, sepsis, aspiration pneumonitis, pulmonary embolism, and eclampsia, Important iatrogenic causes of maternal cardiac arrest include hypermagnesemia from magnesium sulfate administration and anesthetic complication **(Lavonas et al., 2015).**

Differential Diagnosis: The same reversible causes of cardiac arrest that occur in nonpregnant women can occur during pregnancy.But providers should be familiar with pregnancy - specific diseases and procedural complications. Providers should try to identify these common and reversible causes of cardiac arrest in pregnancy during resuscitation attempts **(Jeejeebhoy et al., 2015).**

Emergency Cesarean Delivery in Cadiac Arrest

Evacuation of the gravid uterus relieves aortocaval compression and may improve resuscitation efforts. In the latter half of

pregnancy, Perimortem cesarean delivery (PMCD) may considerd part of maternal resuscitation.(**Levanos et al., 2015)**

Features of the cardiac arrest which can increase the infant's chance for survival:

- Short interval between the mother's arrest and the infant's delivery. Survival of the mother has been reported up to 15 minutes after the onset of maternal cardiac arrest **(Levanos et al., 2015).**
- Neonatal survival has been documented with PMCD performed up to 30 minutes after onset of maternal cardiac arrest **(Levanos et al., 2015).**
- Aggressive and effective resuscitative efforts for the mother **(Levanos et al., 2015).**
- The hysterotomy is performed in medical center with a neonatal intensive care unit **(Levanos et al., 2015**).

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المعاملة التخديرية لحالات طوارئ الولادة عالية الخطورة

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تخضع المرأة الحامل إلى تغيرات فسيولوجية تجعلها تتحمل ضغوط الحمل والولادة و أقرب هذه التغيرات هي التي تتحرك هرمونياً في حين أن التغيرات التي تحدث في وقت لاحق في فترة الحمل ترتبط بالتأثيرات الميكانيكية المصاحبة لكبر حجم الرحم و زيادة مطالب التمثيل الغذائي للجنين ومقاومة إنخفاض تداول المشيمة.

وقد تؤثرالتغيرات الفسيولوجية والتشريحية المصاحبة للمرأة الحامل أثناء فترة الحمل وبالنظر أيضاً إلى وضع الجنين على العملية التخديرية أثناء فترة الحمل، و قد تؤثر على سلامة الأم أثناء التخدير.

وتعتمد نسبة وصول الأوكسجين للجنين على قدرة الأم لحمل الأوكسجين، وكفاءة ضخ القلب للدم، وتحسن الدورة الدموية للمشيمة. ولذلك فإن أى تدخلات تهدد هذه العوامل قد تؤدى إلى إختناق الجنين.

ويأتي النزيف حول فترة الولادة في مقدمة أسباب وفيات الحوامل، والذى ينقسم إلى نزيف قبل وأثناء وبعد الولادة، وقد يحدث تداخل فيما بينهم، ومن أهم أسباب نزيف الأم قبل الولادة هو تقدم المشيمة، وفصل المشيمة، وكذلك تمزق الرحم. أما أسباب نزيف الأم بعد الولادة فهي تتضمن إرتخاء الرحم، والمشيمة المتحجرة، وتهتكات عنق الرحم والمهبل. وتأتى السمنة المفرطة أثناء الحمل من أهم عوامل زيادة الخطورة على الأم والجنين وبالتالي تؤدى إلى زيادة معدلات المرض والوفيات، فهي تعمل على مضاعفة التغيرات الفسيولوجية المصاحبة للحمل مما يؤدى إلى إرهاق جميع وظائف الجسم وبالأخص القلب والجهاز التنفسي.

ويأتي ارتفاع ضغط الدم أيضاً من أسباب وفيات الحوامل وتعتبر الإعتبارات التخديرية لمرضى الضغط المرتفع أثناء الحمل من أهم العوامل التي تساهم في حل المشكلة وعلاجها .

وهناك تغيرات باثوفسيولوجية مؤثرة في أدوية التخدير مما ينعكس دورها على أجهزة الجسم من القلب والأوعية الدموية والجهاز التنفسى والجهاز الهضمى، وهناك مشاكل أخرى تواجه الحوامل وتسبب في زيادة الوفيات ومنها تسمم الحمل، والجلطة الدموية، وأمراض صمامات القلب، والعيوب الخلقية بالقلب.

و تعتمد المعالجة التخديرية في حالات الولادة الحرجة على المحافظة على وظائف القلب والأوعية الدموية ونسبة تشبع الأكسجين في الدم بحيث تكون المعدل الطبيعي مثل حالات الأم الطبيعية والجنين السليم لضمان تحسين الدم الواصل إلى المشيمة، و ولادة طفل سليم بدون مضاعفات جانبية للأدوية المعطاة .