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Nursing Care for Trauma Cases in Obstetrics : Literature Review

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ABSTRACT
Introduction: Trauma is the leading cause of non-obstetric death during pregnancy, and approximately 6-8% of all pregnancies can have complicating injuries (both intentional and unintentional). Obstetric emergencies include bleeding, eclampsia, infection, prolonged labor due to dystocia, and miscarriage. The purpose of this writing is to see what the general approach is in cases of obstetric trauma, what the specific approach is in cases of post-traumatic premature labor, placental abruption, uterine rupture and maternal cardiopulmonary arrest.
Method: This study uses a literature review method.
Result: There are many causes of cardiac arrest during pregnancy. In the United States and the United Kingdom, the most common causes include pulmonary embolism (29%), hemorrhage (17%), sepsis (13%), perinatal cardiomyopathy (8%), stroke (5%), pre-eclampsia-eclampsia Epilepsy (2.8%). And complications related to anesthesia (e.g. difficult intubation, local anesthetic toxicity, aspiration) (2%). In Portugal, similar causes of cardiac arrest during pregnancy, hemorrhage and hypertension account for 50% of maternal deaths. Therefore, in order to provide appropriate treatment, it is very important to identify a reversible cause. Sometimes, the causes of cardiac arrest during pregnancy can be multifactorial, making diagnosis and management more difficult.
Conclusion: Assessment of the traumatized pregnant patient in the Emergency Department requires the involvement of a multidisciplinary team including the emergency physician or trauma specialist (or designated emergency care provider), an obstetrician (or obstetric care provider), neonatologist, anesthesiologist, and skilled nursing staff. In addition, special attention should be paid to the evaluation of the fetus if the gestational age is 23 weeks.

Keywords:*Trauma; Obstetrics; Emergency; Pregnant; ED.*

Introduction

Trauma is the leading cause of non-obstetric death during pregnancy, and approximately 6-8% of all pregnancies can cause injuries (both intentional and unintentional). Early evaluation and treatment of pregnant women with injuries usually requires a multidisciplinary team to provide the best results for the mother and fetus. It is important to realize that the slightest mechanism of injury can lead to unintended consequences for both the fetus and the mother. The number of complicated pregnant injured patients who met the enrollment criteria and the number of patients who needed delivery was gradually increasing. Have the opportunity to identify patients who need treatment and provide supportive measures that can reduce complications of preterm birth. Treated patients can benefit from a multidisciplinary approach (Huls & Detlefs, 2018).

An obstetric emergency is a life-threatening health condition that occurs during pregnancy or during and after labor and birth (Wantania, 2015). An obstetric emergency is a sudden, unexpected, life-threatening condition that requires prompt and appropriate treatment to prevent morbidity and mortality. Obstetric emergencies include bleeding, eclampsia, infection, prolonged labor due to dystocia, and miscarriage(Lumbanraja, 2017).

Management of a pregnant patient with trauma requires special considerations such as changes in maternal physiology and anatomy, exposure to radiation and other possible teratogens, the need to assess fetal well-being, and conditions that are unique to the pregnancy and are specific. Associated with trauma (rhisoimmunization, placental abruption, and preterm labor). Optimizing outcomes in cases of severe trauma requires a multidisciplinary team approach involving trauma surgeons, emergency medicine physicians, obstetricians, neonatologists, nursing staff, and technicians. Obstetricians (or other obstetric care providers) play a major role in determining gestational age, optimizing uteroplacental perfusion, assessing fetal well-being, providing information about risks of radiation exposure and drug use(Jain et al., 2015).

The purpose of writing this essay is to see what the general approach is in cases of obstetric trauma, what the specific approach is in cases of post-traumatic premature labor, abruptio placentae, uterine rupture and maternal cardiopulmonary arrest.

Method

Search strategy

This study used a literature review method which was carried out through the correct stages or research protocols. The procedure for this literature review consists of several steps, namely: 1) setting out the background and objectives; 2) formulating research questions; 3) literature search; 4) selection criteria; 5) checklist quality and procedures; 6) extraction strategy. The researcher also did a screening on the reference list to match the citations related to the research objectives. The keywords used were: 'Trauma', 'Obstetrics', 'Emergency', 'Pregnant', 'ED'.

Inclusion criteria and assessment quality

The inclusion criteria in this study were articles in English and Indonesian, full text, prospective studies, quantitative and qualitative studies, interventions, respondents were nurses who worked in hospitals. The three main electronic databases used for identification of relevant sources are PubMed, EMBASE, Google Scholar published from 2017 – 2021.

Data Extraction

Each journal was extracted separately by using parameters such as journals equipped with researcher information (author, year of publication), place of study, inclusion criteria, and screening results from the nursing care for trauma cases in obstetrics.

Results

In Sharon's 2012 study, maternal outcomes may not be as good as the rest of the heart attack population. Women who received PMCD had a higher mortality rate than women who did not receive heart disease. The recommended time limit of 4 minutes for PMCD is usually still not reached, but if labor occurs, the newborn can still survive. Regardless of the reason for stopping, 10 or 15 minutes after cardiac arrest and newborn survival were closely related to respiratory arrest in hospitalized pregnant women (Einav et al., 2012).

According to the Committee on Trauma of the American College of Surgeons, trauma to pregnant women occurs in 6% to 7% of all pregnancies, and is the largest cause of maternal death. The most common causes of trauma to pregnant women are

traffic accidents (MVC, motor vehicle crashes as much as 42%, followed by falls (falls, 34%), attacks (assaults, 18%) and burns (burns, <1%). Incidence increases with increasing gestational age. More than half of trauma occurs in the third trimester, with traffic accidents accounting for 50%, falls and assaults each 22%, although these data are considered to be underestimates, because many traumas to pregnant women are not included. In the trauma center, and the types of trauma were attacks by close partners or domestic violence (intimate partner violence, IPV 3.3%), suicide (3.3%) (Siswosudarmo, nd).

There are many causes of cardiac arrest during pregnancy. In the United States and the United Kingdom, the most common causes include pulmonary embolism (29%), hemorrhage (17%), sepsis (13%), perinatal cardiomyopathy (8%), stroke (5%), pre-eclampsia-eclampsia Epilepsy (2.8%). And complications related to anesthesia (e.g. difficult intubation, local anesthetic toxicity, aspiration) (2%). In Portugal, similar causes of cardiac arrest during pregnancy, hemorrhage and hypertension account for 50% of maternal deaths. Therefore, in order to provide appropriate treatment, it is very important to identify a reversible cause. Sometimes, the causes of cardiac arrest during pregnancy can be multifactorial, making diagnosis and management more difficult.

Discussion

Assessment of the traumatized pregnant patient in the ED requires the involvement of a multidisciplinary team including the emergency physician or trauma specialist (or designated emergency care provider), an obstetrician (or obstetric care provider), neonatologist, anesthesiologist, and skilled nursing staff. Pregnant patients should be fully assessed, as should non pregnant patients, with a thorough history, examination, laboratory tests, imaging studies, and invasive diagnostic procedures as indicated. In addition, special attention should be paid to the evaluation of the fetus if the gestational age is 23 weeks and complications of trauma typical of pregnancy such as placental abruption. Communication between health care providers can be facilitated by incorporating emergency triage protocols in the management of the pregnancy trauma patient.The initial assessment of an injured pregnant woman should include securing the airway, ensuring breathing, and maintaining adequate circulation. The most

important primary interventions to save life may include, for example, intubation and controlling severe external bleeding.

On the airway, pregnant patients have a greater risk of developing airway management problems and difficult intubation compared to non-pregnant patients. Weight gain, airway mucosal edema, decreased functional residual capacity, decreased respiratory system compliance, increased airway resistance, and increased oxygen demand are changes caused by pregnancy that place an injured pregnant woman at risk of failure to maintain a patent airway and safe ventilation. Early intubation should be considered whenever airway problems are anticipated.

On exhalation, increased basal oxygen consumption and fetal sensitivity to maternal hypoxia require supplemental oxygen by nasal cannula, mask, or endotracheal tube for all pregnant trauma patients to maintain oxygen saturation above 95%. Taking into account the function of the diaphragm during pregnancy, it is recommended to insert a thoracostomy tube, if indicated 1 – 2 intercostal spaces higher than usual.

In the circulation, fluid administration during resuscitation should be continued according to the standard trauma protocol. Nevertheless, some modifications should be made for pregnant trauma victims. Insertion of 2 large needles (sizes 14-16) is recommended for seriously injured trauma patients to facilitate rapid initial crystalloid infusion, expansion of intravascular volume, and possible further blood transfusion as needed. The uteroplacental vessels are highly responsive to vasopressors, and their administration may decrease placental perfusion. In cases of maternal hypotension, vasopressors should be avoided unless the patient is unresponsive to intravascular volume filling with fluid administration. Bicarbonate should be used with caution, as rapid correction of maternal acidosis may reduce compensatory hyperventilation.In cases of obstetric trauma such as premature labor, abruptio placenta, uterine ruptureand maternal cardiopulmonary arrest requires a specific approach, as in the case of:(Jain et al, 2015).

1. Post Traumatic Premature Labor

Premature delivery is one of the most important unresolved reproductive health problems. Preterm birth was defined as birth after 20 and before 37 weeks of gestation. Premature birth is often traumatizing and a source of distress for parents. Increased

parental stress in the first year after the baby is born is a risk factor for behavioral problems later in life(Ghorbani et al, 2014).

Traumatic injury during pregnancy can cause preterm labor by several mechanisms. Traumatic injury to the uterus can cause stabilization of lysosomal enzymes that can trigger the production of prostaglandins. Regardless of the mechanism, trauma (even with minor injuries) is associated with a 2x higher risk of preterm delivery. If the risk of preterm labor is high due to preterm labor or premature rupture of membranes, steroids (and other indicated drugs such as antibiotics and magnesium sulfate), transfer to a tertiary care center, and consultation with a neonatologist are things to consider based on gestational age (Jain et al, 2015).

2. Abruptio Placenta

Placental abruption is a major complication of maternal trauma. Placental abruption is the detachment of part or all of the maternal surface of the placenta from its normal implantation in the decisuous layer of the endometrium prematurely, i.e. before the baby is born (Lumbanraja, 2017). Placental abruption occurs when the placenta breaks off the inner wall of the uterus before birth. This condition can make the baby lose oxygen and nutrients. Most abruptions occur within 2-6 hours after injury and occur for almost 24 hours. Signs and symptoms of placental abruption: (Hammond & Zimmermann, 2017).

a. The abdomen is painful and tender.
b. Pain in the uterus.
c. Uterine contractions or hypertonicity.
d. Premature labor.
e. Vaginal bleeding.
f. Shock.
g. Retroplacental hematoma.

3. Uterine Rupture

Uterine rupture occurs when there is a tear in the uterine wall during pregnancy or childbirth. This case is an obstetric emergency that threatens the life of the mother and fetus. Uterine rupture can be complete or incomplete. It is called a complete uterine rupture if the state of the tear in the uterus has occurred a direct connection between the amniotic cavity and the peritoneal cavity. Meanwhile, incomplete uterine rupture occurs if the abdominal cavity and uterine cavity are still limited by visceral peritoneum. If

there is a total uterine rupture, it will usually be fatal for the mother and fetus (Wantania, 2015).

Uterine rupture occurs as a result of a preexisting injury or anomaly, or it can complicate labor with a previously unscarred uterus. The most common cause of uterine rupture is the separation of scar tissue from a previous cesarean section and is likely to occur more frequently with a tendency to allow parturition in deliveries with a history of cesarean section (Lumbanraja, 2017).

Posttraumatic uterine rupture is rare (0.6% of all maternal injuries), but is more commonly seen with uterine scarring or direct impact to the abdomen during pregnancy. Most uterine ruptures occur in the fundal area. The degree of rupture may vary from complete avulsion of the uterus to serous bleeding and abrasions.Signs and symptoms of Uterine Rupture: (Hammond & Zimmermann, 2017).

a. Abdominal distension.
b. Irregular uterine contractions.
c. Fetal parts can be palpated from outside the uterus.
d. The fetus has bradycardia and asystole.
e. Fetal death.
f. Mother is in hypovolemic shock.
g. Elevation of the presenting part of the fetus and peritoneal irritation (abdominal stiffness, tenderness).

4. Maternal Cardiopulmonary Arrest

Cardiac arrest in pregnancy is one of the most challenging clinical situations. Cardiac arrest in pregnancy is rare, but nearly 10% of maternal deaths are caused by cardiac arrest. Tragically, even when cardiac activity is restored, only about half of victims of ventricular fibrillation cardiac arrest admitted to the emergency department survive and return home. This means three out of four attempts at cardiopulmonary resuscitation (CPR) are unsuccessful. Attempts at CPR in a pregnant patient may be hindered by the physiologic changes that occur. Therefore, obstetricians/gynecologists must understand the physiological changes that occur in pregnancy and affect resuscitation potential. CPR is a team effort. Although the obstetrician/gynecologist may not actually "run the code" in most circumstances,The causes of cardiac arrest in pregnancy are obstetric and non-obstetric causes: (AHA, 2002)

Obstetric Causes

a. Bleeding
b. Preeclampsia
c. HELLP Syndrome (Hemolysis, Elevated, Liver Enzyme and Low Platelet)
d. Amniotic fluid embolism
e. Peripartum cardiomyopathy
f. Anesthesia complications

Non-Obstetric Causes

a. Pulmonary embolism
b. Septic shock
c. Cardiovascular disease
d. Myocardial Infarction
e. Endocrine disorders
f. Collagen vascular disease

Conclusion

An obstetric emergency is a sudden, unexpected, life-threatening condition that requires prompt and appropriate treatment to prevent morbidity and mortality. Obstetric emergencies include bleeding, eclampsia, infection, prolonged labor due to dystocia, and miscarriage. Assessment of the traumatized pregnant patient in the ED requires the involvement of a multidisciplinary team including the emergency physician or trauma specialist (or designated emergency care provider), an obstetrician (or obstetric care provider), neonatologist, anesthesiologist, and skilled nursing staff. Pregnant patients should be fully assessed, as should non pregnant patients, with a thorough history, examination, laboratory tests, imaging studies, and invasive diagnostic procedures as indicated. In addition, special attention should be paid to the evaluation of the fetus if the gestational age is 23 weeks and complications of trauma typical of pregnancy such as placental abruption.

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