Types of Injuries in Pregnancy

Hubble
Trauma in Pregnancy

EMC 420: Maternal & Child Emergency Care
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Objectives

At the conclusion of this lecture, you will be able to discuss various types traumatic injuries in the pregnant patient, such as:

- Blunt abdominal injuries
- Penetrating abdominal injury
- Pelvic fracture
- Traumatic arrest
- Minor trauma
- Other types of trauma

Blunt Abdominal Injuries

- Possible serious intra-abdominal injuries:
- Peritoneal bleeding (laceration of spleen or liver)
- Retroperitoneal bleeding
- Abruptio placenta
- Uterine injury
- Rupture of the diaphragm, rarely
- Up to 40 % of major maternal life threatening abdominal injuries will have abruptio placenta

Minor Blunt Abdominal Trauma

Occurs in:

- Restrained / lap belt injury
- Unrestrained MVA injury
- Falls onto the abdomen
- Domestic violence
- 5 % of minor trauma is complicated by abruption
  - "Minor" trauma is never minor.

Pelvic Fracture

- Especially dangerous in pregnant MVC patient
  - Increased risk of hemorrhagic shock
- Nearly 20 % of trauma deaths associated with pelvic fracture and hemorrhagic shock
- Marked increase in vascularity predisposes to either
  - Intraabdominal, and / or
  - Retroperitoneal
    - Capacity for greater than 4000 ml blood loss

Pelvic Fracture Complications

- Uterine injury
- Direct fetal injury
- Other injuries (that are similar to as non-pregnant patients' injuries)
  - Laceration of urethra, vagina, bladder, ureter
  - Fat embolism
  - Fracture of the lumbar spine

Penetrating Abdominal Injury

- Surprisingly low incidence of non uterine injury
- Maternal mortality of less than 5 %
- Non-uterine injuries occur in only 20 % of penetrating maternal wounds (compared to an organ injury rate of 75 % in non pregnant patient)

Penetrating Abdominal Injury

- Injuries usually associated with:
  - Domestic violence
  - Attempts to cause abortion
  - Random violence
- Trauma frequently directed at fetus:
  - Fetal injury rate is extremely high (93 %)
  - Fetal mortality rate is 60 %
- Most common wounds:
  - Knife and gunshot wounds

Traumatic Arrest In Pregnancy

- Guided by accepted protocol
  - Clinical and ethical decisions and
  - Pronouncement of death
- Resuscitation decisions will differ significantly from those of the nonpregnant patient
- Arrest : maternal VS have disappeared (and injury incompatible with life has occurred)
- Fetal vital signs may or may not be present
  - Fetus' best chance for survival is an aggressive resuscitation of the mother by the paramedic
  - If mother in full arrest, determine if candidate for emergency C-section upon hospital arrival

Traumatic Arrest and *Maternal* Resuscitation

- Fetal viability is not the paramedic's sole concern
- ***Maternal*** resuscitation may be enhanced by emergency caesarian delivery
  - Maternal survival has occurred after "post mortem" caesarian section
  - Factors favoring maternal resuscitation:
    - Removal of uterine vena cava compression probably most significant

Perimortem Caesarian Section

- Emergency C section criteria should be considered for any traumatic arrest during pregnancy if:
  - No return of maternal pulse and BP
  - After 4 min. of ALS
- 2 criteria favoring fetal (and perhaps maternal) survival are:
  (1) ***Time*** since the loss of maternal circulation and
  (2) Fetal ***age***

Timing of Caesarian Section

- Chance for fetal survival
  - Time
    - Shorter time from maternal arrest to delivery the greater chance for fetal survival
    - And improved chance of a neurologically intact newborn
    - Survival after 25 minutes of maternal arrest has never been reported
  - Age
    - 25 weeks or greater : gestational age considered viable
    - Paramedic estimates fetal age : assessing fundal height of uterus

On-line Communication

- Will facilitate ED prep for
  - Determination of fetal viability,
  - Confirmation of fetal age, and
  - Surgery in the emergency department.
- Fetus chance of survival:
  - Emergency C section performed within ***five*** minutes after loss of maternal vital signs
  - If maternal traumatic arrest not specifically addressed in protocols and standing orders, then paramedic cannot legally or ethically terminate CPR in a pregnant patient.

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Resuscitation of Traumatic Arrest In Pregnancy

- All the usual
  - Rapid removal from scene
    [goal: to be in ED in 1-3 min. after arrest]
    - Semi-Immobilization, or
    - No Immobilization
  - ABCs, ET, high flow O2
  - 2 LBIV NS WO
- 27 degree left tilt

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Non-Traumatic Arrest In Pregnancy

- PIH
- Embolism
- Hemorrhage
- Sepsis
- Cardiac
  - Cardiomyopathy
  - Arrhythmias
    - OD / Toxic[cocaine] - arrhythmia
- Uterine rupture

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Minor Maternal Trauma

- Poor pregnancy outcomes : in up to 5 %
- Often appear perfectly stable
  - Ambulatory at accident scene
  - May request refusal of transport release
- Dismissing injuries as “trivial” risks
  - missing serious injury
  - May cause fetal death
  - And on rare occasion, maternal death
- Failure to transport pregnant patient with minor injury is a decision weighted with serious medicolegal concerns

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Minor Maternal Trauma

- Two common injuries often considered minor
  - Falls
  - Seat belt injuries
- Because of the frequency of these injuries
  - They account for greatest absolute number of adverse pregnancy outcomes

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Maternal Trauma - Falls

- Common during pregnancy
- 80 % occur in last 2 months of pregnancy
- occur more during last two months of pregnancy than during any other period in a woman’s life [except …after age ?]
- Majority of falls cause no significant maternal injury
- Approximately 2 % of maternal deaths are the result of falls
- Abruptio and fetal death may result from simple fall

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Seat Belt Injuries

- Non paramedic public still has misunderstanding of safety of seat belt use during pregnancy
  - Despite more than 25 yrs of scientific evidence
- Any (either 2-point lap or 3-point) use of seat belt restraints:
  - protection against maternal death, which is the leading cause of fetal death.
- 3-point restraint system further reduces risk of both maternal and fetal injury during pregnancy.

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Maternal and Fetal Seat Belt Injuries

- Incidence of abruptio placentae : not increased usage of seat belts
- Three-point restrained pregnant women (In deceleration injuries) :
  - lower risk for abruptio placentae than those in a two point or lap belt
- Proper use of lap belt portion (across pelvis, not the abdomen) of the 3-point restraint during pregnancy may further reduce the risk of fetal injury.

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Other Trauma: Fetomaternal Hemorrhage

- Transplacental transfusion of fetal blood into maternal circulation
- Incidence and severity: not necessarily correlated with degree of maternal trauma
- 90 % : uncomplicated
- Complications
  - May be lethal for the fetus.
  - Sensitization of Rh negative mother
    - And fetal hemorrhagic shock
- In-hospital recognition : Rh incompatibility disorder
  - Easily prevented with anti-Rh immunoglobulin (RhoGam)

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Isolated Abdominal Trauma

- Isolated abdominal trauma
- Multisystem trauma may result in
- Uterine injury and uterine rupture
- Premature labor, premature rupture of the amniotic sac
- Abruptio placenta

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Uterine Rupture

- Injury is unique to pregnancy
  - Extremely rare
  - Less than 1 % of pregnant trauma patients
  - Usually occurs only with major trauma
    - Frequent non-uterine life-threatening injuries
- With multisystem trauma
  - Inter abdominal bleeding
  - Asymmetrical abdomen
  - Ill defined uterine fundus

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Maternal Survival in Uterine Rupture

Even though uterine rupture occurs only after enormous amount of direct uterine trauma

- Maternal survival is likely
  - If hypovolemia and concurrent injuries are well managed
  - Maternal mortality is less than 10 %
- Fetal mortality is nearly 100 %
  - Much higher mortality than abruptio placenta

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Sexual Assault

- 2 % of sexual assault victims :
  - Pregnant at the time of assault
  - Uncertain statistics: more than 80 % of all sexual assaults go unreported
- Majority take place prior to 5th month
- Management
  - Approach much the same way as nonpregnant
  - Responsibility : care for both physical and psychological needs of the patient

Thermal Injury

- Rare
- Same survival rate as nonpregnant women
  - Greater than 50 % BSA
    - Maternal mortality is approximately 70 %
- Fetal survival parallels :
  - % of burned BSA and survival of mother
    - Severely burned woman
      - Fetal prognosis : very poor

Smoke Inhalation

- Chemical Pneumonitis
  - Pregnant women tolerate poorly
  - Aggressive ABCs
    - Correct hypoxia
    - Correct shock

Electrical and Lightning Injuries

- Maternal mortality rare
- Fetal mortality and morbidity is high
  - Poor fetal outcome occurs in overwhelming majority of cases (approximately 75 %)
  - Risk of spontaneous abortion and fetal demise
  - Thought to result from amniotic fluid and electrolytes : very effectively conduct current flow to fetus

Summary

- Abdominal Injury
  - Blunt and Penetrating
- Pelvic Fracture
- Traumatic Arrest
- Minor Trauma
- Fetomaternal hemorrhage
- Other Trauma
  - Uterine rupture
  - Sexual assault
  - Thermal injury
  - Electrical and Lightning Injuries