# Trauma in Pregnancy

*Dr. Anju Huria*

**Professor & Head**

**Department of Obstetrics & Gynaecology**

**GMCH - 32, Chandigarh**

# Trauma in Pregnancy

- Unique challenge for provider
- Two Patients (mother and foetus)
- Pregnancy changes in various systems can mask / mimic injury

## Causes:

**Accidents and Violence**

**40% injury related hospitality ? Of pregnant women per 1000 deliveries in USA**

**Trauma is leading cause of death in pregnant women**

| | | |
|---|---|---|
| Gun shot wounds | 23% | |
| Motor vehicle accident | 21% | 2 / 3rd |
| Stab wound | 14 | |
| Strangulations | 14% | |
| Head injury | 9% | |
| Burns | 7% | |
| Falls | 4% | |
| Toxic exposure | 4% | |
| Drowning | 2% | |
| Iatrogenic injury | 2% | |

# Physiological changes in Pregnancy

## CVS

- Circulating blood volume increases 20 – 30%
- Plasma volume increases 40%
- Red cells 15 – 25%

- Hypervolemia of pregnancy
- Relative Anaemia
- Increased blood flow to uterus
- Pulse rate increases 10 – 15 / mt
- BP may fall 10 – 15 mmHg in $2^{nd}$ trimester
- Also falls in $3^{rd}$ trimester if patient is placed supine

## Supine Hypotension Syndrome

- This is due to compression of inferior vena cava and aorta by the enlarged gravid uterus causing a fall in BP when patient is supine.
- Always keep 15˚ left lateral tilt
- Because of an increase in blood volume of almost 1500 ml or even more, this much blood loss may not alter any vital parameters – pulse, BP. If BP is low or tachycardia is present in a patient blood loss has been excessive (> 1500ml).

## Respiratory System

- Progesterone hormone increases respiratory rate by 15% even in 1st trimester.
- Minute ventilation and tidal volume increase 50% and 40% respectively.
- This hyperventilation leads to hypocapnia.
- As uterus enlarges (in 3rd trimester) diaphragm is splinted up functional residual capacity decreases and residual volume decreases 20%.

## Also $O_2$ requirement increases in pregnancy

**Therefore, whenever respiration ceases, more rapid onset of hypoxia.**

**Other changes**

- **Kidneys – slight enlargement (Physiologic hydronephrosis)**
- **↑ GFR**
- **↓ S. creatinine and Bl. Urea**
- **Coagulation factors ↑ in pregnancy**
- **Pulmonary thromboembolism risk is more in pregnancy**
- **GIT – Because of relaxing effect of progesterone on smooth muscles, gastric emptying time is increased, esophageal sphincter is relaxed. Both these facts can lead to aspiration pneumonia.**
- **Even after 8 hours of fasting, some gastric contents of acidic pH are present.**

# GIT

- Delayed gastric emptying time and relaxed esophageal sphincter.
- Movements of abdominal organs intestine and bladder move upwards.
- Uterus is next to abdomen wall so takes brunt of trauma.

## Shock

- Because of increased circulating blood volume, patient may not show much change in vitals.
- However, vaso constriction and decreased blood flow to uterus occurs first leading to fetal hypoxia.
- Loss of 30 – 35% of blood volume before developing hypotension.

## Mechanism of injury

- Motor vehicle
- Penetrating injuries
- Falls
- Burns

## Assessment

### Mother

- Initial rapid assessment

### Fetus

- Abdominal tenderness
- Uterine hardness / ut contraction
- Fetal heart rate (electronic monitoring)

## Management

- Airway / assist ventilation
- Spine motion restriction if indicated
- High flow $O_2$
- Control external bleeding (Massive blood loss may have occurred in the uterus due to placental separation (Concealed APH).

## So if no sign of external haemorrhage:

- Supine hypotension , change to left lateral
- BP still low – concealed haemorrhage in uterus
- I/V fluids
- Transport with 15º left lateral tilt of the board

## Management

- Treat shock to keep systolic B.P. 90 – 100 mmHg
- Aggressive fluid therapy
- MAST (Military Anti Shock Trousers) application not for pregnant patients. Only on legs may be applied.

# Vehicular Accidents

## Seatbelt use

*ACOG recommends:*

- The shoulder harness passes between the patient's breasts
- Lap belt passing below the abdomen and over the ant superior iliac spines and symphysis pubis

  (Between the breasts and under the bump)

# Clinical Presentation

- Mechanism of trauma
- LMP
- Pain abdomen
- Leaking / bleeding P/V

# Primary and Secondary Trauma Surveys

As usual

Secondary survey to include

P/A

- Height of uterus
- Contractions
- ? Tense – Tender
- FHS (CTG)
  (USG)

- Speculum examination for any lacerations specially if pelvic injuries / fractures present
- Should be done where LSCS can be done

## Investigations

- TLC 12000 – 25000/cc (Normal in pregnancy)
- UPT if clinically pregnancy is not obvious
- Kleihauser-Betke test (for Rh-negative patients) will guide us about how much Anti-D to give.
- X-ray
- Should not be curtailed because of pregnancy.
- Slight cardiomegaly seen in chest X-ray may be due to pregnancy only.
- Pelvic X-rays may show slight widening of sacroiliac joints and symphysis pubs and should not be misdiagnosed us fracture / dislocation.

- USG
- MRI

Options to avoid C.T. Scan

But can be done if benefits outweigh the risk

## Fetal tests

- If any h/o trauma and mother is fine
- Fetal monitoring for 24 hours after injury if fetus is viable (≥ 28 weeks in most places)
- Prior to that, even if fetal hypoxia occurs, nothing to be done as even after LSCS fetal survival is dismal
- Patient to be told that fetal demise can occur due to trauma and risk remains for up to 24 hours.

## Perimortem Caesarean Delivery

The resuscitation council for special situation has recommended that prompt caesarean section should be considered a resuscitative procedure for cardiac arrest in near term patients.

- In case of severe maternal morbidity
- Patient ventilated
- Difficult to revive
- Caesarean section can be done

  a) To save the baby

  b) To save mother : fetal delivery
- Will reduce $O_2$ demand of mother
- Ventilation will improve as diaphragm is no longer splinted.

## Prehospital Care

- ABC to be followed
- Always give supplemental $O_2$
- Beyond 20$^{th}$ week, patient to be tilted 15˚ to the left by placing rolled towels beneath the spinal board. Supine hypotension can decrease cardiac output by upto 25%
- If patient does not require spinal immobilization she can be asked to assume left lateral decubitus position.
- FHS can be heard to reassure mother
- Military Anti Shock Trousers are considered to Class III intervention (inappropriate, possibly harmful) for gravid patients. If used inflate only the leg compartment.

## Emergency Department Care

**Patients with**

- **Minor trauma and pregnancy < 20 weeks do not require specific monitoring**
- **More than 28 weeks – Electronic fetal monitoring for 4 hours.**

## Airway and Breathing

- Decision for intubation same as for non pregnant patients
- Risk of aspiration is increased
- If a chest tube is to be placed, enter the chest 1 – 2 interspaces higher than usual because diaphragm is raised up in last trimester

## Circulation

**Maintain B.P.**

***If Rh negative***

- **Anti D Prophylaxis should be given**

## Complications

1. Rupture uterus due to direct trauma

- Amniotic Fluid Embolism

- Placental Abruption


Thank you