The Pregnant Pause

Guidelines for managing the pregnant trauma patient

Julie Miller
Royal Melbourne Hospital
University of Melbourne

Injury 2008
Primary Survey

- Same principles as non-pregnant
- **AIRWAY**
  - 8x rate of failed intubation
  - Increased risk of aspiration
- **BREATHING**
  - Careful chest tube placement
  - Liberal use of oxygen
- **CIRCULATION**
  - 15° left lateral tilt
Secondary Survey

- β-hCG in all females under 50
- Obstetric history
  - Viable fetus = >24 weeks
- Obstetric consult
  - Pelvic exam
- Kleihauer-Betke test
  - 8-30% FMH
  - Predictor of preterm labour
- Rhogam in Rh- mothers
Fetal Assessment

- Main risks:
  - Preterm labour
  - Placental abruption
- Uterine tenderness/contractions
- Vaginal bleeding
- Fetal heart tones
- CTG monitor x 4-6 hours
  - If >24 wks
- Ultrasound
Placental Abruption

- 2-4% of minor trauma
- Up to 50% of major trauma
- 20-35% fetal mortality
- Signs:
  - Fetal distress by CTG
  - Vaginal bleeding, cramps
  - Uterine tenderness
- U/S picks only half
- TX: abruption + distress
  - = immediate delivery
Alarm bells

- urgent obstetric review for >24 wks and:
  - vaginal bleeding
  - uterine irritability
  - abdominal tenderness
  - pain
  - cramping
  - absent fetal heart tones
  - leaking amniotic fluid
Secondary Survey
Special Considerations

- Obstetric history – accurate dates
- Anti-D (Rhogam) if Rh-
  - Kleihauer test
- Further imaging?
Diagnostic workup

- We are highly dependent on imaging as an adjunct to physical examination.

- BUT, we are concerned about birth defects from ionizing radiation.

- How do we manage risk vs benefit of imaging the pregnant patient?
Overview

2 important factors

1. EXPOSURE: most x-rays pose minimal risk
2. BACKGROUND RISK: of all pregnancies is of 3% for major birth defects and 15% for miscarriage.
Risk to foetus

- Most diagnostic procedures expose the foetus to < 5 rad

- < 5 rad will not increase reproductive risks (birth defects or miscarriage).

- The reported dose of radiation to result in an increased incidence of birth defects or miscarriage is > 20 rad.
Imaging - data

- Radiation to fetus 1/3 that of mother
- Risks: death, birth defects, LBW, leukemia
- < 5 rad *definitely* safe
- < 10 rad *probably* safe

<table>
<thead>
<tr>
<th>Study</th>
<th>Fetal rads</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR</td>
<td>0.005</td>
</tr>
<tr>
<td>PXR</td>
<td>0.4</td>
</tr>
<tr>
<td>CT head</td>
<td>0.05</td>
</tr>
<tr>
<td>CT chest</td>
<td>0.1</td>
</tr>
<tr>
<td>CT A/P (10mm)</td>
<td>12</td>
</tr>
</tbody>
</table>

from EAST practice management guidelines
Risk from non-abdo/pelvis exam

- When a diagnostic x-ray study (including CT) is of the head, neck, chest, or limbs, the radiation exposure is not to the fetus.

- Scatter that might reach the fetus is miniscule and would not represent an increased risk for birth defects or miscarriage.
If the foetus is exposed

- The patient must be informed about the magnitude of the radiation dose to the embryo/fetus and counselled about any potential risks.

- The practitioner must not, on purely physical considerations, recommend a termination of the pregnancy.
Summary

- There is no reason to avoid use of non-abdo CT to evaluate a pregnant trauma patient.
- CT will provide more accurate diagnostic information than any other procedure and will allow the mother the best chance for survival and completion of the pregnancy.
- Decisions about abdo or pelvic imaging should be made at a senior level and with multidisciplinary input.
Imaging - recommendation

- Image pregnant women as needed
- Plain x-rays are safe
- CT head and c-spine are safe
- Shield abdomen
- Use ultrasound over CT for abdominal imaging when possible
- Exposure is higher with fluoroscopy
- Mother still comes first
Perimortem caesarian

- Conventional CPR is less effective
- Open chest CPR may be indicated
- No CPR is effective if heart is empty
- Consider peri mortem Caesarian if
  - Uterus is above umbilicus or viable fetus
    - >26 weeks
  - Evidence of heart activity
  - CPR for no longer than 10 mins
- Outcomes
  - 50% live birth rate
  - Time delays = neurological sequelae
  - Long term survival rate 5%
Acknowledgements

Kellie Gumm
Rodney Judson
Jeremy Oats
Stephan Heinz
RMH Pregnancy Working Party
Epidemiology

- Trauma affects 8% of pregnancies
- Trauma admission in 1/250 pregnancies
  - 50% road trauma
  - 22% falls
  - 22% assault
- 80% fetal mortality if maternal shock
Changes in Pregnancy

- **Physiology**
  - Increased plasma volume, HR, CO
  - Decreased BP, FRC, gastric emptying
  - Supine hypotension syndrome
  - Hypercoagulable state
  - Uteropelvic blood flow

- **Anatomy**
  - Enlarged uterus
  - Raised diaphragm
  - Stretched peritoneum
IN A NUTSHELL:

You look after the fetus by looking after the mother.
Priorities

- Primary survey (mother)
- Foetal assessment
- Secondary survey of mother
- Definitive care of both patients