Obstetrics Emergencies

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Obstetrics emergencies

- Maternal: haemorrhage, hypertensive disorders, pulmonary embolism...cardiac arrest
- Fetal: “fetal distress”, cord prolapse, shoulder dystocia, placental abruption
- Uterine rupture
- Antenatal maternal conditions which cause circulatory insufficiency, hypoxia, hypoxaemia, acidosis, all put the fetus at risk too
Example: Eclampsia

• Para 0, 37 weeks, attended A&E because of upper abdominal pain, BP 140/90.

• Transfer to AN ward

• On arrival to AN ward, complained of headache and blurring of vision, BP 150/100

• Put on CTG

• Generalized convulsion while preparing for Magnesium sulphate infusion
CTG during eclampsia

Eclampsia: management

- Turn mother lateral, ensure safety, airway
- Start magnesium sulphate
- Control the maternal blood pressure
- If not in labour or in early labour, deliver by LSCS when the maternal condition is stable
- Need to check platelet count, coagulation
- Need an experienced anaesthetist
- May need HDU or ICU care after delivery
Eclampsia: We all know

Are you sure?

• Airway: do we put in a gag to prevent biting? Do we need to put in an oral pharyngeal airway? Who is going to do that?

• Where is the Magnesium sulphate kept?

• How to set up the loading dose?

• Which anaesthetist to call? What is the anaesthetist’s contact phone number?

• ........
Eclampsia: learning points

• Anticonvulsant prophylaxis may be started at A&E before transfer
• Other medical disciplines are involved (common multidisciplinary protocol, line of communication)
• Need to know how to set up magnesium sulphate infusion as quickly as possible (cue cards, drugs in emergency trolley, drills)
• Treat the mother (or stabilize the mother) if possible, before delivering the baby
Eclampsia: learning points

• Anticonvulsant prophylaxis may be started at A&E before transfer
• Other medical disciplines are involved (common multidisciplinary protocol, line of communication)
• Need to know how to set up magnesium sulphate infusion as quickly as possible (cue cards, drugs in emergency trolley, drills)
• Treat the mother (or stabilize the mother) if possible, before delivering the baby
Treat the mother first before treating the baby

- If you can treat the mother quickly and effectively, both the mother and baby will benefit

- The rare case of GDM presenting with diabetic ketoacidosis: the fetus is also acidotic and will show very abnormal CTG but if delivered immediately, the mortality for the baby is high. Correcting the ketoacidosis before the delivery may give the baby a better chance.
Obstetrics emergencies: Some special characteristics

- Two lives at stake (for antenatal emergencies)
- Potentially good outcome (young age, no premorbid pathology)
- Bad outcome can be devastating for the family
- Not always predictable
- Can happen very quickly, without warning or with warning signs within minutes
- Relatively rare
- Need a rapid response team, often multidisciplinary
Have you seen it in the past 12 months?

- Fetal distress?
- Cord prolapse?
- Shoulder dystocia?
- Eclampsia?
- Amniotic fluid embolism?

When was the last time you do CPR on a pregnant woman, or on any person?
Robinson Road tree fall: Pregnant woman dead, baby in intensive care after emergency caesarean
The case of Perimortem Caesarean section

- Are we supposed to stabilize the mother first?
- Perimortem or postmortem?
Perimortem/postmortem Caesarean section

Perimortem Caesarean section:
• The primary aim is to facilitate CPR of the mother (ideally 4 minutes after initiation of CPR if no return of pulse), performed while CPR is continued

Postmortem Caesarean section:
• The aim is to save the baby (there has been reported survival 30 minutes after maternal cardiac arrest)

- Retrospective review of perimortem CS (1985-2004): 38 cases published
- 25 mothers died before discharge (65.8% maternal fatality)
- 20 were primarily done for the mother: 13 mothers survived
- 30 perimortem CS resulted in 34 surviving infants (21 no sequelae, 8 with sequelae, and long term data not reported in 5)
# Improvement of Maternal Circulation after Delivery of Baby

**Table III**  
Effect of perimortem cesarean section on maternal circulation, reported cases 1985-2004

<table>
<thead>
<tr>
<th>Time from maternal cardiac arrest until delivery (min)</th>
<th>Return of spontaneous circulation and or improvement in hemodynamic status</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6-10</td>
<td>3</td>
<td>—</td>
</tr>
<tr>
<td>11-15</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>&gt;15</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not reported</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

Do you know what is MOET?
Do you know what is MOET?
MOET and perimortem CS


Netherlands 1993-2008: 55 cases of pregnant women with cardiac arrest, 12 had PMCS, use of PMCS increase after MOET

However, maternal survival did not improve. PMCS were still performed >5 minutes after CPR started. 8 women had circulation established after PMCS but only 2 survived.
Simulation training for obstetrics emergency
Conflict of interest

ALSO®(Hong Kong)
Qualified instructor and advisory faculty since 2005
Chair of the advisory board 2010-2013
Simulation training for obstetrics emergency

TeamSTEPPS®

ALSO

BLSO

Basic Life Support in Obstetrics
Two important components of simulation training

• Skills training
• Team training:
  – Communication
  – Working as teams
## Is it really effective?

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Simulators</th>
<th>Publications</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Available but not adequate for training</td>
<td>None</td>
<td>Not described</td>
</tr>
<tr>
<td>Level 2</td>
<td>Described but not commercially available</td>
<td>Descriptive only</td>
<td>Not described</td>
</tr>
<tr>
<td>Level 3</td>
<td>Available and adequate</td>
<td>Yes</td>
<td>Improvement in provider’s confidence</td>
</tr>
<tr>
<td>Level 4</td>
<td>Available and adequate</td>
<td>Yes</td>
<td>Objective improvement in simulated cases</td>
</tr>
<tr>
<td>Level 5</td>
<td>Available and adequate</td>
<td>Yes</td>
<td>Objective improvement in real cases</td>
</tr>
</tbody>
</table>

## Is it really effective?

<table>
<thead>
<tr>
<th>Topic</th>
<th>Level of evidence</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia</td>
<td>4</td>
<td>Objective improvement in simulated cases</td>
</tr>
<tr>
<td>PPH</td>
<td>3</td>
<td>Objective improvement of specific tasks</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>4</td>
<td>Objective improvement in simulated cases</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>5</td>
<td>Objective improvement in real cases (Best studied obstetrics emergency with simulation)</td>
</tr>
<tr>
<td>Cesarean delivery</td>
<td>2</td>
<td>Improvement in provider confidence, no commercially available simulators</td>
</tr>
<tr>
<td>Umbilical cord prolapse</td>
<td>5</td>
<td>Improved decision to delivery interval in real cases</td>
</tr>
</tbody>
</table>

Shoulder dystocia

- Draycott et al (2008): PROMPT, shoulder dystocia rate similar before and after simulation training but neonatal injury reduced (9.3% to 2.3%)

<table>
<thead>
<tr>
<th>Incidence (%)</th>
<th>Pretraining (n=324)</th>
<th>Posttraining (n=262)</th>
<th>Relative Risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal injury at birth</td>
<td>30 (9.3)</td>
<td>6 (2.3)</td>
<td>0.25 (0.11–0.57)</td>
</tr>
<tr>
<td>Brachial plexus injury at birth</td>
<td>24 (7.4)</td>
<td>6 (2.3)</td>
<td>0.31 (0.13–0.72)</td>
</tr>
<tr>
<td>OBPI at 6 mo</td>
<td>9 (2.8)</td>
<td>2 (0.8)</td>
<td>0.28 (0.07–1.13)</td>
</tr>
<tr>
<td>OBPI at 12 mo</td>
<td>6 (1.9)</td>
<td>2 (0.8)</td>
<td>0.41 (0.1–1.77)</td>
</tr>
<tr>
<td>Fractured clavicle or humerus</td>
<td>6 (1.9)</td>
<td>2 (0.8)</td>
<td>0.41 (0.1–1.77)</td>
</tr>
<tr>
<td>Apgar score less than 7 at 5 min</td>
<td>12 (3.7)</td>
<td>6 (2.3)</td>
<td>0.61 (0.24–1.57)</td>
</tr>
</tbody>
</table>

CI, confidence interval; OBPI, obstetric brachial plexus injury.

*(Obstet Gynecol 2008;112:14–20)*
Shoulder dystocia

- Inglis et al (2011) have similar findings

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Characteristics of all deliveries during study period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretraining ( n = 6269^a )</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>83 (1.32%)</td>
</tr>
<tr>
<td>OBPI</td>
<td>25 (0.40%)</td>
</tr>
<tr>
<td>Maternal age, y, mean</td>
<td>26.27</td>
</tr>
<tr>
<td>Maternal diabetes mellitus</td>
<td>239 (3.81%)</td>
</tr>
<tr>
<td>Spontaneous onset of labor</td>
<td>3124 (49.83%)</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>122 (1.95%)</td>
</tr>
<tr>
<td>Gestational age, d, mean</td>
<td>275.73</td>
</tr>
</tbody>
</table>

\(^{a}\) Presented as n (%) unless otherwise noted; \(^{b}\) Determined by binomial test with pretraining proportion used as hypothesized proportion for posttraining period; \(^{c}\) Not significant.

Shoulder dystocia

- Grobman et al (2011) used a low fidelity manikin but put emphasis on protocol and team drills

<table>
<thead>
<tr>
<th>Variable</th>
<th>Period, %</th>
<th></th>
<th></th>
<th>P value^a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (n = 77)</td>
<td>B (n = 100)</td>
<td>C (n = 77)</td>
<td></td>
</tr>
<tr>
<td>Brachial plexus palsy at birth</td>
<td>10.4</td>
<td>4.0</td>
<td>2.6</td>
<td>0.03</td>
</tr>
<tr>
<td>Brachial plexus palsy at discharge</td>
<td>7.8</td>
<td>3.0</td>
<td>1.3</td>
<td>0.04</td>
</tr>
<tr>
<td>Apgar score &lt;4 at 5 min or umbilical cord arterial pH &lt;7.0</td>
<td>0</td>
<td>2.0</td>
<td>1.3</td>
<td>0.46</td>
</tr>
<tr>
<td>Estimated blood loss ≥500 mL</td>
<td>10</td>
<td>16</td>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>3rd or 4th degree laceration</td>
<td>24</td>
<td>15</td>
<td>19</td>
<td>0.40</td>
</tr>
</tbody>
</table>

^a Test for trend.

Obstetrics drill in QMH

• 3-4 structured drills per year with 4 stations and 4 teams of doctors and midwives
  – Shoulder dystocia and neonatal resuscitation*
  – Eclampsia and maternal resuscitation^
  – Vaginal breech delivery
  – Postpartum haemorrhage

• 6 on site drills (unannounced) per year:
  – Eclampsia, shoulder dystocia, undiagnosed breech in labour, cord prolapse, neonatal resuscitation, PPH

* Anaesthetists involved  ^ Paediatricians involved
Drills help us in:

- Hands-on skills
- Communication
- Refining our protocol
- Detecting and rectifying system problems
- Improving documentation
Obstetrics emergency: take home messages

- Rare
- Multidisciplinary
- Simulation training is effective
- In-house drills important
- Protocol in place