Pregnancy and Pre-delivery Emergencies

Niamh Daly
Objectives

• Physiology of a normal pregnancy.
• Explore the structures relating to reproduction
• Pregnancy related terminology
• Physiological maternal changes during pregnancy
Objectives

• Outline & management of the following pre delivery emergencies:
  • Bleeding in pregnancy.
  • Ectopic pregnancy.
  • Pre eclampsia.
  • Eclampsia.
Pregnancy

“Sequence of events that begins with fertilisation; proceeds to implantation, embryonic development and fetal development; and ideally ends with birth about 38 weeks later”.

Reference: Tortora G., Derrickson B. Principles of Anatomy and Physiology; Wiley 2011; Ch 29, p1181
Female Reproductive System

Uterus and Uterine tubes

- Infundibulum
- Uterine tube
- Fundus
- Uterus
- Fimbriae
- Ovary
- Cervix
- Endometrium
- Myometrium
- Perimetrium
- Vagina
Conception

• Ovulation
• Fertilisation (occurs in distal third of fallopian tube)
• Implantation (occurs in the uterus)
Embryo

- From fertilisation through the eighth week
Fetus

• Growth and differentiation of tissues and organs
Trimesters of pregnancy

- First trimester – 1-12 weeks
- Rudiments of all major organ systems appear
- Most vulnerable stage
Trimesters of Pregnancy

- Second Trimester – 13-28 weeks
- Near complete development of organ systems
- Distinctive human features

Second Trimester
(week 13 - week 28)
Trimesters of Pregnancy

- Third Trimester – 29- 40 weeks
- Rapid fetal growth
- Organ systems become functional
Structures of pregnancy

• Placenta
• Umbilical cord
• Amniotic sac and fluid
Placenta
• An organ attached to lining of the uterus which links fetal and maternal blood supply
Functions of the Placenta

- Exchange of nutrients and waste between mother and fetus
- Respiratory gas exchange
- Transfer of heat
- Hormone production
- Protective barrier against harmful substances
Umbilical Cord

• Connects the fetus to the placenta
• Contains two arteries and one vein.
• Connective tissue called Wharton’s Jelly, surrounded by amnion
• Approx 50cm at term
Amniotic Sac

• Membrane surrounding the fetus
• Contains clear amniotic fluid which protects the fetus.
• The fluid contains carbohydrates, proteins, lipids and electrolytes which aid in the growth of the fetus.
• Approx 1L at term
Obstetrical terminology

• Gravida – number of all the pregnancies, past and current.
• Para – number of live births
• Gestation – duration of pregnancy
• Antepartum – period before delivery
• Postpartum – period after delivery
• Term – a pregnancy that has reached 40 wks gestation
Obstetrical terminology

- Multigravida – two or more pregnancies
- Nulligravida – has not been pregnant
- Primigravida – first pregnancy
- Multipara – two or more deliveries
- Nullipara – a woman who has never delivered
Physiological Maternal Changes

- Pregnancy causes physiological changes to nearly all organ systems.
- Most return to normal after delivery!
Group Work
Pre-delivery emergencies

• Spontaneous abortion (miscarriage)
• Third trimester bleeding
• Ectopic Pregnancy
• Pre-eclampsia
• Eclampsia
Miscarriage

- Natural death of an embryo/fetus in utero before the 20th week of gestation.
- Different classifications:
  - Threatened
  - Inevitable
  - Incomplete
  - Complete
  - Missed
- Management?
Third Trimester Haemorrhage

• Never normal!!

• Three main causes
  – Placenta Previa
  – Placental Abruption
  – Uterine Rupture
Placenta Previa

- Placenta implanted low in uterus, may partially or fully obscure the cervical canal.
- Painless bright red bleeding which increases as labour begins.
- Fetal compromise
Placental abruption

- Premature separation of normally implanted placenta from uterine wall.
- 1 in 100 pregnancies

Causes
- Hypertension (44%)
- Trauma
- Preeclampsia
- Previous abruption
- Infection
Placental Abruption

- Pain – abdomen may be tender/rigid
- Blood loss may be minimal or concealed – usually dark
- Shock
- Absence of fetal movement
Uterine rupture

• Rare!
• Spontaneous or traumatic rupture of uterine wall
• Causes
  – Previous scar opens
  – Trauma
  – Prolonged/obstructed labour
Uterine Rupture

- Sudden abdominal severe pain
- Signs of shock
- Vaginal bleeding may be hidden
- Active labour
Management

DO NOT PALPATE ABDOMEN: MAY INCREASE BLEED.
DO NOT EXAMINE INTERNALLY
DO NOT PACK VAGINA

• 100% Oxygen via non-rebreather mask
• > 24 weeks = Left Lateral Tilt
• Apply absorbent pad
• Treat for shock
• Call for ALS if haemodynamically unstable.
• Psychological support.
• Rapid transport to hospital.
Ectopic pregnancy

• Fertilised egg implants outside the uterus
• Approx 1 in 100
• 97% occur in fallopian tubes
• 3% occur cervix, ovaries, bowel
• Leading cause of death in the first trimester
Sites for Ectopic Pregnancy

The different places where ectopic pregnancy can occur
Signs & Symptoms

• Early pregnancy symptoms as normal
• Severe abdominal pain – onset 7-12 wks
• Nausea/vomiting
• Vaginal bleeding
• Shock
• Shoulder tip pain – ominous sign
• Cullen’s sign – bruising around umbilicus
Management

• 100% oxygen via non rebreather mask
• Nil by mouth.
• Keep warm
• ECG / vital signs. Recheck regularly.
• ALS for IV fluids if sys BP < 90.
• Rapid transport.
Pre-eclampsia

• Hypertensive disorder specific to pregnancy
• Affects approx. 2000 women annually in Ireland
• Accounts for 15.9% of maternal deaths in US
• Usually occurs from 20 weeks gestation
Pre-eclampsia

Diagnosis based on presence of three criteria

• Significant hypertension 140/90

• Proteinuria

• Gross oedema
Pre-eclampsia
Signs and symptoms

• Headache
• Nausea/vomiting
• Abdominal pain
• Lower back pain
• Changes in vision
• Shortness of breath
• Seizures
Eclampsia

- Same signs and symptoms plus seizures or coma
- Tonic clonic seizures
- Often begins as oral twitch
- Patient can become apnoeic during seizure
- Can initiate labour
Management

• 100% oxygen via non re-breather mask
• Rapid transport to ED – left lateral recumbent position
• Pre-alert ED
• If seizures – treat with midazolam
• Check blood sugar – treat if indicated
Summary

• Physiology of a normal pregnancy.
• Define the terms; fetus, placenta, amniotic sac, umbilical cord, perineum.
• Physiological maternal changes during pregnancy.
Summary

• Assessment & management of the following pre delivery emergencies:
  • Bleeding in pregnancy.
  • Ectopic pregnancy.
  • Pre eclampsia.
  • Eclampsia.
References

- Tortora G., Derrickson B. Principles of Anatomy and Physiology; Wiley 2011; Ch 29, p1181
- http://embryo.soad.umich.edu/
Fetal Mal-presentation

Sandra Rock
Objectives

• To Define Mal-presentation
• Look at the types of Mal-Presentation
• Some factors that may contribute to Mal-Presentation
• Management
Mal-Presentation

- The **presentation** of a fetus about to be born refers to which anatomical part of the fetus is leading into the pelvic inlet of the birth canal. Based on the leading part, it is identified as a cephalic, breech, or shoulder presentation.

- A **mal-presentation** is any presentation other than a vertex presentation (the top of the head first).
Mal-presentation

- Mal-presentations may not be identified until late into the pregnancy and in some cases not until the initial assessment during Labour
Factors that can contribute to a mal-presentation

- Pre-term baby
- Multiple fetus in the uterus
- If the Mother has had more than one pregnancy
- Too much or too little Amniotic fluid in the uterus
Factors... continued

- Placenta Previa

- If the Uterus is not normal in shape

- If abnormal growth eg. Fibroids are present in Uterus
Anatomy of pregnancy

Fetus in Utero

- Placenta
- Umbilical Cord
- Amniotic Sac
- Fetus
- Uterus
- Uterine Wall
- Cervix
- Vagina
- Anus
All mal-presentations are managed expectantly during labour and may result in a vaginal delivery. When the mal-presentation is identified, the mother should be prepared of the necessity for caesarean delivery if the mal-presentation persists.
Frequency of mal-presentation

- Total mal-presentation 8.6%
  - Cephalic 5.4%
  - Breech 3.1%
  - Transverse 0.12%

Ref:
Acta Obstet Gynecol Scand. 2011
Types of Mal-presentation

• Breech
  – Complete Flexed breech presentation
  – Footling presentation
  – Frank (extended presentation)
  – Kneeling Breech presentation
Breech presentation

Fetus presents into the pelvis by the buttock/feet/foot first

30% of pregnancy's present as Breech at 30 weeks

3% of all deliveries present as Breech at term

• Flexed
  
  Fetal buttock as well as fetal feet present to the pelvic inlet

• Extended
  
  The buttock alone present to the pelvic inlet (Frank)
Types of Breech Births

Frank Breech

Baby’s bottom will present first legs will be flexed at the hips and knees extended with feet up at ears
Complete Breech

• The baby’s knees and hips are flexed and they are sitting in a crossed leg position with feet beside the bottom
Footling Breech

- One or both feet present first
- The bottom is higher
- Unusual at full term but can occur in preterm frequently
Kneeling Breech

• This is very rare
• The baby is in a kneeling position with legs extended at the hips and flexed at the knees
Cephalic/Vertex Presentations

- Cephalic/Vertex presentation is a description of how a baby presents during childbirth, in which the baby leads with the back of the head or occiput, so that the head is the first thing into and out of the birth canal.
Cephalic/Vertex Presentation’s
Types of Mal-Presentation

- **Vertex**
  - Brow presentation
  - Face presentation
  - Cephalic presentation

- **Transverse/Shoulder presentation**
Brow presentation
Largest part of the head will be trying to fit into the pelvis

Face presentation
The baby’s face is first part to present at the birth canal
Compound presentation

Compound presentations occur when a fetal extremity presents in front of or next to the presenting part. Most compound presentations are either a hand or arm next to the fetal head.
Occasionally (about 1 in every 400 births) the baby is lying across ways in the uterus, called a 'transverse lie'. When this happens, the baby's back or shoulder covers the woman's cervix. This is known as a 'shoulder presentation'.

![Image of baby in transverse lie/shoulder presentation]
• Breech position
• Prolapsed cord position
Haemorrhage prior to delivery position
Pre-hospital care

• CPG’s
  – Pre-hospital emergency childbirth
  – Haemorrhage in pregnancy prior to childbirth
  – Postpartum Haemorrhage
  – Umbilical Cord Complications
  – Breech Birth
  – Basic & Advanced Life Support- Neonate < 4 weeks
  – External Haemorrhage- Adult
Management of Mother pre-hospital Breech childbirth

- Sample History
- If birth is imminent inform control and request ALS
- Monitor Vital signs
- Position Mother (Lithotomy) prepare equipment for birth
- Support baby as it emerges-avoid manipulation of baby’s body
- Transport if no ALS available
- Consider Entonox
Management of the baby

• Dry, stimulate by tactile stimulation, wrap and keep warm
• Monitor baby’s vital signs, resps and heart rate initiate CPR if Hr <60 or inadequate breathing.
• If HR>100 and resp not adequate assist with ventilations
• Keep warm
• Continuous monitoring watching for any cardiovascular and or respiratory distress.
• Transport
Assessment
Summary

• Mal-presentations
• Positions of mothers for delivery
• Management of mother and baby
• Factors that contribute to mal-presentation
References

• Phecc CPG’s 3rd edition
• Nancy Caroline Emergency care in the street’s 6th Ed Ch 30,1-31
• Acta Obstet Gynecol Scand. 2011

• Images
  – Dailytelegraph.com
  – Transitionparenthood.com
  – Science&sensibility.org
Thank You

Questions?

Thank you.......Questions?
Thermoregulation in the new-born
Mary O’Neill
September 2014
Objectives

• Identify the normal temperature range for a neonate.
• Predict the effects of cold stress on the infant.
• Outline the sources of heat loss and suggest ways of avoiding heat loss in the pre-hospital environment.
Background

• Control of thermoregulation is one of the critically important factors in physiology of the well being of the infant

• The neonate is no exception to the general rule that body temperature is the result of a balance between heat production and heat loss.
• A- Airway
• B- Breathing
• C- Circulation
• D- Degrees
Body temperature in the newborn infant

• Classification of hypothermia is based on core temperature
  – NORMAL – 36.5 to 37.3°C (97.7 – 99.2°F)
  – Cold Stress 36.0 to 36.4°C (96.8 – 97.6 °F)
    • Cause for concern
  – Moderate hypothermia 32 – 35.9°C (89.6-96.6°F)
    • Danger, warm infant
  – Severe hypothermia – below 32°C (89.6 °F)
    • Outlook grave, skilled care urgently needed
Thermoneutral Environment

- Temperature and environmental conditions at which metabolic rate and O2 consumption are lowest
How does an infant maintain temperature

- Babies try to produce heat by:
  - Increasing their metabolic rate
  - Non Shivering Thermogenesis
  - Increasing their motor tone & activity (limited response)
  - Vasoconstriction (limited response)
Increasing muscle tone and activity
Peripheral Vaso-Constriction.
Infants at risk of Hypothermia

- All infants in first 12 hours
- Low birth weight
- Preterm infants
- Asphyxiated infants
- Abnormal skin integrity
- Neurologically impaired
- Any infant already stressed metabolically.
Mechanisms of Heat Loss
Conduction

• The transfer of heat between two solid objects.
• i.e. infants body and mattress/stretcher/stethoscope/your hands.

• What can YOU do to prevent conductive heat loss???
Convection

• When the infants body heat is swept away by air currents. i.e. drafts from air vents/windows/doors/fans/traffic.

• Heat loss is accelerated when the environmental air temp is colder and/or when the air flow velocity is higher.

• **How would you prevent this??**
Evaporation

• Occurs when moisture on the skin surface or the respiratory tract mucosa is converted to vapour.
• This process ALWAYS has a cooling effect.
• Most commonly insensible loss.

• How would you prevent this??
Radiation

- The transfer of heat between solid surfaces that are not in contact with each other.
- i.e. exposed infants body surface and adjacent windows/walls.
- Remove cold objects from the bed/wrap or dress baby quickly/place skin to skin and cover.

What contributes to this??
Detrimental effects of hypothermia.

Cold stress

↓

Hypothermia

↓

Signals to hypothalamus

↓

Activates noradrenaline release
Effects of noradrenaline

- Peripheral vasoconstriction
- Pulmonary vasoconstriction
Cold \(\rightarrow\) \(\uparrow\) O\(_2\) consumption \(\rightarrow\) \(\uparrow\) Respiratory rate \\
\(\downarrow\) O\(_2\) uptake by lungs \(\rightarrow\) Pulmonary vasoconstriction \\
\(\downarrow\) O\(_2\) to tissues \(\rightarrow\) Peripheral vasoconstriction \\
\(\uparrow\) Anaerobic glycolysis \(\rightarrow\) in Po\(_2\) and pH \\
\(\downarrow\) Metabolic acidosis
The warm chain

- Warm delivery room
- Immediate drying
- Skin to skin contact
- Breast feeding
- Bathing and weighing postponed
- Appropriate clothing/bedding
- Mother and baby together
- Warm transportation
- Warm resuscitation
- Training and awareness (Who ’97)
Preventative measures at delivery

- Environmental temp 25 °C
- Dry baby thoroughly
- Remove wet linen (replace with warm towel)
- Draught free
- <1500g/28 weeks..plastic wrap
- Skin to skin
- Hat on dry head
Conclusions

- Hypothermia in the newborn is due more to a lack of knowledge than to lack of equipment.
- Hypothermia is a preventable condition that has well documented impact on morbidity and mortality.
- Therefore, assisting the infant to maintain a normal body temperature and preventing hypothermia during stabilization is critical.
References


While I am Cool... kids should never be as Cold as I am.