Precipitous Delivery
Are you prepared?

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Objectives
- Review the physiology of labor & delivery
- Review the basic equipment needed for a successful emergency department delivery
- Manage complications associated with antepartum and intrapartum emergencies

Physiology
- A woman’s vital signs change during pregnancy.
- Heart rate increases
- Blood pressure decreases

Physiology
- Heart Rate - increases 15-20 beats/min to an average pulse of 80-95 by 3rd trimester
- Blood Pressure
  - 2nd trimester --> decreases to an avg of 102/55
  - 3rd trimester --> increases to an avg of 108/67
Physiology

- Cardiac output increases 40%
- Stroke volume increases 25-30%
- Plasma volume increases 45-50%
- RBC mass increases 33% but not as fast as plasma volume
  - Physiologic anemia
- Slight respiratory alkalosis

What can possibly go wrong?

- PreEclampsia/Eclampsia
- Vaginal bleeding
  - Placenta Previa, Abruption
- Prolapsed cord
- Malpresentation
  - Breech, Limb, Face delivery
- Meconium staining
- Premature delivery

Antepartum Emergencies

- Pre-eclampsia/Seizures (Eclampsia)
- Vaginal Bleeding

Pre-eclampsia

- Hypertension after 24th week of gestation
  - New onset or worsening of chronic HTN
- 5-7% of pregnancies
- Most often in first pregnancies
- Other risk factors include young mothers, no prenatal care, multiple gestation, lower socioeconomic status
Pre-eclampsia

- Triad
  - Hypertension
  - Proteinuria
  - Edema

Etiology?

- “Disease of theories”
- Abnormal endothelial fxn-cytokines (i.e., tumor necrosis factor α) and endothelin-1

Pre-eclampsia - Searching for the Cause

Pre-eclampsia

- Signs and Symptoms
  - Hypertension
    - Systolic > 140 mm Hg
    - Diastolic > 90 mm Hg
    - Or SBP > 30 mmHg or DBP > 15 mmHg above patient’s baseline BP
  - Proteinuria
    - 1+ urine dip or >300 mg in 24 hrs
  - Edema (particularly of face)

- Rapid weight gain
  - >3 lbs/wk in 2nd trimester
  - >1 lb/wk in 3rd trimester
- Decreased urine output
- Headache, blurred vision
- Nausea, vomiting
- RUQ or Epigastric pain
Pre-eclampsia

- Complications
  - Eclampsia
  - Abruption
    - Premature separation of placenta
  - Cerebral edema or stroke
  - Renal failure
  - Hemolytic anemia
  - Thrombocytopenia
  - Hepatic hematoma/hepatic failure
  - Retinal damage
  - Pulmonary edema
  - IUGR

Management

- Labor induction if term
- Consider if pre-term
- Lateral recumbent position
- Bedrest
- Lower blood pressure if SBP>170 or DBP>105
- Betamethasone if <34wks gestation

Eclampsia

- Occurs in less than 1% of pregnancies
- Signs, symptoms of pre-eclampsia plus:
  - Grand mal seizures
  - Coma

- Complications
  - Same as pre-eclampsia
  - Maternal mortality rate: 10%
  - Fetal mortality rate: 25%

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34 year old 35 week pregnant female with no PMH BIBA for seizures. Found down at home by husband, sz’ed twice in the ambulance. C/o HA & epigastric pain night prior. Paramedic report no head trauma but ecchymosis on chest and neck. VS: BP 200/116, HR 90, RR 18, 100% NRM, FHT 140’s. What do you do?

Question

- What is the best anti-convulsive treatment for eclampsia?
  - A. IV phenytoin
  - B. IV diazepam
  - C. IV magnesium sulfate

How should we treat seizures?

- Magnesium sulfate > phenytoin or diazepam

Eclampsia

- Management
  - 100% O₂: assist ventilations, as needed
  - Left lateral recumbent position
  - MgSO₄
    - 6 gm IV bolus, then 2 gm/hr
    - 10 gm IM if no IV access (5gm each buttock)
  - Betamethasone if <34 weeks gestation

Collaborative Eclampsia Trial
Lancet 1995 June 10:345:1455-63
Magnesium sulfate

- Reduces risk of recurrent seizure, maternal mortality and neonatal morbidity
- Mechanisms: potent vasodilator (against vasospasm) and NMDA receptor antagonist (neuroprotection)
- "MgSO4" now on list of JCAHO-prohibited abbreviations


Magnesium sulfate

- 4g IV loading dose over 15 minutes then 1-2 g/hr infusion
- Maintain serum concentration 4-7 mg/dL (when serum level is not readily available, infusion should be titrated to maintain deep tendon reflexes)
- Maternal toxicity of magnesium is rare if drug is carefully administered & monitored

Side Effects

- Drowsiness
- Flushing
- Diaphoresis
- Hyporeflexia
- Hypocalcemia

Your patient has been admitted for eclampsia and is receiving magnesium sulfate at 2gm/hr. You assess that your pt’s respirations are 8 per min and you cannot elicit a reflex. What do you do?

- A. Discontinue magnesium & get a neurology consult.
- B. Discontinue magnesium and administer O2
- C. Discontinue magnesium and give O2 and 1 gm calcium gluconate IV.
Toxicity

- Absent DTRs (deep tendon reflexes)
- Ataxia
- Pulmonary edema
- Respiratory paralysis

Antidote

- Calcium gluconate
- Calcium chloride- greater concentration

Magnesium sulfate

- First warning of toxicity is loss of DTRs (8-12 mg/dl)
- Somnolence (10-12 mg/dl)
- Slurred Speech (10-12 mg/dl)
- Muscular paralysis (15-17 mg/dl)
- Respiratory difficulty (15-17 mg/dl)
- Cardiac arrest (30-34 mg/dl)

Your eclamptic patient is approximately 2 hours out from her seizure. Labor induction is progressing successfully with cervix now 6 cm dilated. Her BP has been consistently elevated, with the last 2 readings approx 165/110. Your choice for antihypertensive therapy is:

- a. methyldopa (Aldomet) 500mg PO
- b. hydralazine 5 mg IV
- c. nifedipine 10 mg PO
- d. labetalol 20 mg IV

Sibai BM, NEJM 1996;335(4):257-265
Treatment of Hypertension in Pregnancy
Hydralazine
- Arterial vasodilator
- 5 mg IV, then repeat 5 mg IV for 20 min up to 20 mg total dose
- IV infusion 5-10 mg/hr titrated
- Must wait 20 min for response between IV doses; possible maternal hypotension

Labetalol
- Selective $\alpha$ and nonselective $\beta$ antagonist
- 20 mg IV, then 40-80 mg IV for 10 minutes to 300 mg total dose
- IV infusion 1-2 mg/min titrated
- Less reflex tachycardia and hypotension than with hydralazine

Abruption
- Premature separation of placenta from uterus
- High risk groups: Older pregnant patients, Hypertensives, Multigravidae, Pre-eclampsia, Trauma, Cocaine

Signs and Symptoms
- Mild to moderate vaginal bleeding
- But may have “concealed” bleeding at fundus
- Continuous, knife-like abdominal pain
- Rigid, tender uterus between contractions
- High frequency, low amplitude contractions
- Signs, symptoms of hypovolemia
- Fetal distress
Abruption
Third-trimester abdominal pain equals Abruption until proven otherwise

Abruption
Hypovolemic shock out of proportion to visible bleeding equals Abruption until proven otherwise

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Abruption
- Management
  - 100% O₂
  - Left lateral recumbent position
  - Supportive care for hypovolemic shock
  - OR if fetal distress

Placenta Previa
- Implantation of placenta over cervical opening
**Placenta Previa**

- **Signs and Symptoms**
  - Painless, bright-red vaginal bleeding
  - Classically after sex/vaginal penetration
  - Soft, non-tender uterus
  - Signs and symptoms of hypovolemia (proportional to blood loss)
  - May cause reflexive contractions (“irritability”)
  - Fetal distress

- **Management**
  - Bedrest and “vaginal rest”
  - If decompensating,
    - 100% O₂
    - Left lateral recumbent position
    - Supportive care for hypovolemic shock
    - Cesarean delivery
    - Betamethasone if <34 weeks gestation

**Placenta Previa**

A vaginal exam should **NEVER** be performed on a patient in the 3rd-trimester with vaginal bleeding until you know where the placenta is located

**Labor**

- Define it.
- “It’s involuntary uterine contractions that result in effacement & dilation of the cervix and actual expulsion of the products of conception.”

Rosen et al.
**Stages of Labor**

First Stage: Contraction & dilation

Second Stage: Baby moves through birth canal & is born

Third Stage: Placenta delivered

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**History**

- Is this your 1st baby?
- When did your water break? Color?
- Have you been receiving pre-natal care?
- Do you expect any complications?
- Are you currently taking any prescription medication?
- Have you been using any drugs or alcohol?
- Do you feel the need to push or have a BM?

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**Imminent Signs of Delivery**

- Need to bear down or have a BM
  - “I need to poop”
- Crowning
- Rupture of amniotic sac
- Contractions
  - 1 to 2 minutes apart
  - Regular
  - Lasting 45 to 60 seconds

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**Delivery**

- Call for help
- Peds, OB, NICU
  - Warming unit, warm blankets
Basic Equipment

- Sterile gloves
- Surgical scissors - 1 pair
- Hemostats or cord clamps - 3
- Small rubber bulb syringe
- Towels - 5

Basic Equipment

- 1 dozen 2” x 10” gauze sponges
- Baby blanket - 1
- Sanitary napkins
- Plastic bag

Delivery

- Control head and support perineum
- Slight downward pressure to decrease pressure on urethra

Delivery

- Place gloved hand on presenting part to prevent “explosive” delivery
Check the neck for the umbilical cord.

If the cord is around the neck, attempt to slip it over the baby’s head.

If it can’t be removed and if it’s tight, the cord must be clamped and cut.

Suction the Airway

On delivery of head, suction mouth then nose

Do not wait to suction if possible shoulder dystocia

Presumed large baby, “turtle sign”
Delivery

- Gently guide baby’s head down to deliver anterior shoulder
  - Do NOT pull outward to avoid brachial plexus injury
- Gently guide baby’s head up to deliver lower shoulder AFTER the anterior shoulder has cleared the pubic bone
- Gently assist with delivery of rest of baby by elevating baby up off the perineum

Anterior Shoulder Delivery

Posterior Shoulder Delivery
**Delivery**
- **Control** slippery baby during delivery
  - Support head, shoulders, feet
  - Consider delivering in the bed with patient on her side
  - Keep baby’s head lower than feet to facilitate drainage of secretions from mouth
- Dry and stimulate baby
- Keep baby warm

**Clamp, Cut Cord**
- Clamp about 4” from baby
- Second clamp 2” further away from first
- Cut between clamps

**Delivery**
- Bring warmer if available
- Flick baby’s feet, rub back to stimulate
- Do NOT shake infant
- Do NOT slap buttocks
- “Blow-by” O₂ if:
  - Heart rate < 100
  - Persistent central cyanosis present
- Resuscitate if necessary

**APGAR Score**
- Developed by Virginia Apgar
- Quick evaluation of infant’s pulmonary, cardiovascular, neurological function
- Useful in identifying infant’s needing resuscitation
APGAR Score

Determine at 1 and 5 minutes postpartum!

Delivery of Placenta

Delivery of placenta can take up to 30 minutes. Don’t pull on the placenta, especially if preterm.

Placenta

- Check that placenta appears complete
- Check for trailing membranes, missing cotyledons

Maternal Care: Postpartum

- Palpate fundus after placenta delivered
- Examine perineum & cervix for laceration
- Consider prophylactic Oxytocin before or after placenta to decrease bleeding
  - 20 units in 1L NS
- Place pad on perineum to help estimate bleeding
Maternal Care: Postpartum

- Excessive Bleeding
  - Oxytocin (Pitocin) 10 units IM after anterior shoulder or 40 units into 1 liter NS open wide
  - Methylergonovine (Methergine) 0.2 mg IM/PO qid qm
    - Contraindication: HTN or PreEclampsia/Eclampsia
  - Carboprost (Hemabate) 250 µg IM
    - Contraindication: Asthma

- Shock
  - IV, O2, Monitor
  - T & C

Uterine massage

Shoulder Dystocia

- Wedging of anterior shoulder behind pubic bone
- Impaction of the fetal shoulders and thorax prevents adequate respiration and compression of the umbilical cord
- Associated with post-term pregnancy, fetal macrosomia, diabetes mellitus, maternal obesity, and multiparity
  - Most can’t be predicted

Complicated Deliveries
**McRobert’s maneuver**
- Extreme lithotomy position with knees to chest
- Moderate suprapubic pressure applied to abdomen by assistant while gentle downward traction is exerted on the fetal head

**Techniques**
- Check maternal position and make sure buttocks beyond bed or woman lying on her side
- DON’T pull outward and try these maneuvers repeatedly

**Techniques**
- Deliver the posterior arm
- Wood’s corkscrew maneuver: 2 fingers into vagina and exerts pressure on fetal scapula, rotating posterior shoulder 180 in corkscrew fashion
- Fracture clavicle (push out, not into lungs)

**Breech Position**
Care for Breech Presentation

- Place mother in same position as cephalic delivery
- Administer high-flow oxygen
- Allow delivery to occur spontaneously until foot, buttocks and trunk are delivered (support head)
- **DO NOT PULL BABY!!**
- Glide shoulders out of the birth canal

Care for Breech Presentation

- Deliver one arm at a time
  - Rotate shoulder anteriorly and sweep arm down
  - Deliver head by putting finger in baby’s face, make a “V” with index and middle fingers on either side of baby’s nose to FLEX the head

Care for Breech Presentation

- Suprapubic pressure may help flex baby’s head
- Have someone else support the body in a towel
- Prepare for neonatal resuscitation

Management of breech birth with undelivered head.
Limb Presentation

- Place mother in position that removes pressure from cord (head down or pelvis elevated)
- Administer high-flow oxygen
- Exert gentle pressure on baby’s body to prevent pressure on the cord (maintain this position en route to OR)
- Get to the OR immediately

Prolapsed cord:
- A condition in which the umbilical cord delivers through the vagina before any other presenting part.

The cord may be compressed between the baby’s head and wall of the birth canal, which prevents oxygen from reaching the baby.

Prolapsed Cord
Prolapsed Cord

- Administer high-flow oxygen
- Place mother in a position that removes pressure from cord (head down or pelvis elevated)
- Encourage mother to blow/pant; don’t push during contractions

Prolapsed Cord

- Place gloved hand in vagina
- Apply gentle pressure upward on presenting part; relieve pressure on cord
- If cord visible outside vagina, apply moist, sterile dressings
- OR immediately with someone’s gloved hand in vagina

Management of Prolapsed Cord

Premature Infants

- Definition
  - < 37 weeks gestation
  - Very low morbidity if >34 weeks
Premature Infants

- Management
  - Keep baby warm
  - Keep airway clear
  - Assist ventilations if necessary
  - Resuscitate if necessary
  - Watch umbilical cord for bleeding
  - Avoid contamination

Conclusions

- Delivery of the baby and placenta is a natural act that requires little assistance.
- Treat eclampsia with magnesium sulfate.
- Treat HTN with hydralazine or labetalol.
- 3rd trimester abdominal pain = abruption
- Hypovolemic shock out of proportion to visible bleeding = abruption

Conclusions

- NEVER perform a vaginal exam on 3rd trimester bleeding in case of a Placenta Previa.
- Never pull on the placenta.
- Use McRobert’s maneuver for shoulder dystocia.
- DO NOT pull a Breech Baby.
- OR immediately for limb and prolapsed cord.