Preterm Labour and Preterm Birth

Definition
• Preterm Labour
  – regular uterine contractions accompanied by progressive cervical dilatation and / or effacement > 20 wks and < 37 wks
• Preterm Birth
  – any birth < 37 wks

Incidence
• Increased from 6.3% (1981 – 1983) to 7.7% (2009)
• 1% – 2% deliver before 34 wks

Morbidity and Mortality
• 75% of perinatal mortality occurs in preterm births
• Short term morbidity
  – RDS
  – IVH
  – NEC
• Long term neonatal/pediatric morbidity
  – respiratory
  – CNS and neurodevelopmental
  – blindness and deafness

Causes of Preterm Birth
1. Preterm prelabour rupture of membranes (PPROM) 30% – 40%
2. Spontaneous preterm labour with intact membranes 40% – 50%
3. Indicated 20% – 30%

Gestational age at birth and survival to discharge from participating NICUs

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**Etiology of Indicated Preterm Birth**
- Preeclampsia
- Complicated IDDM
- Abnormal fetal surveillance
- IUGR
- Abruption
- Intrauterine fetal death
- Chorioamnionitis
- Monoamniotic/monochorionic twins

**Risk Factors for Spontaneous Preterm Birth**

- **Reproductive history**
  - previous PTB
  - advanced reproductive technologies
- **Cervical factors**
  - cervical insufficiency, uterine malformation, fibroids
  - excisional cervical treatment for CIN (e.g. LEEP)
- **Fetal/intrauterine factors**
  - multifetal gestation
  - fetal anomaly
  - polyhydramnios

**Risk Factors for Spontaneous Preterm Birth (cont’d)**
- APH
- PPROM
- Infection
  - chorioamnionitis
  - bacteriuria
  - periodontal disease
  - current bacterial vaginosis with history of PTB

**Demographic factors**
- low SES, low level education
- marital status (single)
- maternal age <18 or >35

**Lifestyle issues**
- smoking, illicit drugs
- stress, physical abuse
- inadequate prenatal care
- low pre-pregnancy weight, poor weight gain in pregnancy
- obesity

**Predictors of Preterm Birth**
- Fetal fibronectin
  - benefit in its negative predictive value
- Cervical length by transvaginal ultrasonography
  - may guide management

**Diagnosis Approach**
1. Early antepartum education about the signs and symptoms of preterm labour (contractions, pv fluid loss/bleeding, ↑ pelvic pressure, low backache)
2. Women should understand that if symptoms occur, timely physical assessment is necessary
3. Telephone consultation is insufficient
Preterm Labour and Preterm Birth

Prevention

• Primary Prevention
  – smoking cessation, stopping substance abuse
  – addressing barriers to prenatal care
• Secondary Prevention
  – screening and treating for asymptomatic bacteriuria (LBW)
  – screening and treating for BV in women who have had a prior preterm birth (PPROM, LBW)

Vaginal Progesterone

• History of spontaneous singleton PTB < 34 wks
  – micronized PG 100 mg daily 20 → 36 wks
• Incidental short cervix (20mm at < 24 wks)
  – micronized PG 200 mg daily 20 → 36 wks
• ↓ risk PTB < 32-34 wks BT Wt < 2500 gms
• No role in twin pregnancies

Cerclage

• Cervix ≤ 25 mm before 24 weeks gestation if hx of spontaneous PTB or cervical insufficiency
• No role in incidental finding of short cervix
• No data to support adding progesterone therapy

Management Objectives

1. Early diagnosis of preterm labour
2. Identify the cause of preterm labour
   – treat the underlying cause when possible
3. Attempt to arrest labour when appropriate
4. Intervene to minimize neonatal morbidity and mortality

Assessment – Review Prenatal Record

• Establish dates
  – 7-14 week U/S is recommended
  – by mid-trimester the EDD should be known by the patient
• Identify risk factors

Assessment

• Evaluate contractions
• Cervical assessment
  – speculum exam
    • rule out PPROM if indicated
    • IFN
    • culture GBS (others if indicated)
  – digital exam
**Prolongation of Pregnancy**
- Prolongation for 48 hours allows for the administration of steroids +/- transfer to a higher level center as necessary

**Tocolytics**
- Some evidence for efficacy
  - calcium channel blockers (nifedipine)
  - PG synthetase inhibitors (indomethacin)
- Limited evidence of benefit
  - nitroglycerin

**Nifedipine**
- Meta-analysis suggests lower rate of delivery within 7 days and < 34 wks, reduced RDS, NEC, IVH and jaundice (findings driven by one study)
- Less side effects and discontinued treatments
- No placebo controlled trials
- Suggest loading dose 10 mg po q15 – 20 mins (max 40 mg), then 10 – 20 mg po q6-8h. Stop 48h after first steroid dose

**Indomethacin**
- 3 trials compared with placebo
- More effective than placebo in delaying delivery ≥ 37 wks (based on one small study)
- Consider 100 mg PR for transport, may repeat 25 – 100 mg po q6h x max 48h
- Significant fetal concerns
  - closure of ductus arteriosis in utero (limit use to < 32 wks)
  - oligohydramnios

**Tocolytics – Contraindications**
- Maternal medical indication for deliver
- Chorioamnionitis
- Mature fetus, imminent delivery
- Fetal death, lethal fetal anomaly
- Abnormal fetal surveillance
- Significant APH
- Contraindications to specific tocolytic agents

**Prolongation of Pregnancy**
- No evidence for efficacy
  - bed rest
  - fluid bolus
  - sedation
  - magnesium sulphate
  - progestational agents
  - home uterine activity monitoring
Respiratory Distress Syndrome

- RDS is a major cause of mortality and morbidity
- Incidence of RDS is reduced by antepartum steroids

RDS – Incidence

Prophylactic Corticosteroids vs. no Treatment

<table>
<thead>
<tr>
<th>Outcome</th>
<th>RR (95% CI)</th>
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<tbody>
<tr>
<td>RDS (all)</td>
<td>0.66 (0.59, 0.73)</td>
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<tr>
<td>IVH Dx by US</td>
<td>0.54 (0.43, 0.69)</td>
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<tr>
<td>NEC</td>
<td>0.46 (0.29, 0.74)</td>
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<tr>
<td>Neonatal Infection</td>
<td>0.56 (0.38, 0.85)</td>
</tr>
<tr>
<td>Neonatal Death (all)</td>
<td>0.69 (0.58, 0.81)</td>
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</tbody>
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Recommendations

When should steroid therapy be instituted?
- Lower gestation limit: 24 wks
- Upper gestation limit: 34 wks
- Indicated, scheduled pre-labour CS: ≤ 37 wks
- Prophylactic administration depends on diagnosis and risk
- Repeated courses: No
- “Rescue” course: Consider if < 33 wks

Steroid Options

- Betamethasone 12 mg IM q24h x 2 doses
- Dexamethasone 6 mg IM q12h x 4 doses

Caution with Use of Steroids

- If immediate delivery is indicated, do not delay to wait for steroid effect
- Transient elevation of blood glucose and WBC
- Contraindications: active TB, gastric ulcer, chorioamnionitis
**Antibiotics**
- IAP for GBS, if status positive or unknown

**Magnesium Sulfate**
- For neuroprotection, not as a tocolytic
- Imminent preterm birth
  - active labour/planned PTB
  - ≥ 4 cm +/- PROM
- Viability to < 31 + 6 wks
- 4 gm loading dose over 30 minutes followed by 1 gm/hr until delivery

**Maternal Transport – Considerations**
- Available level of neonatal or obstetrical care
- Available transport and skilled personnel
- Travel time
- Risk of journey – maternal and fetal/neonatal well-being
- Risk of delivery en route

**Contraindications to Transport**
- Unstable mother
- Atypical/abnormal fetal surveillance
- Imminent delivery
- No experienced attendants to accompany mother
- Weather or other hazardous conditions for travel

**Transport Plan**
- Copies of antenatal forms, lab results, ultrasounds
- Communication – patient, family and receiving physician
- Attendant for transport
- IV access, indicated medication, equipment
- Assessment of patient immediately prior to transport

*These issues are detailed in the SOGC Maternal Fetal Transport Guidelines and in other provincial guidelines*
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Location of Preterm Birth

Best
- Level III Hospital (NICU)
- Level II Hospital
- Level I Hospital

Worst
- During Transport

Conclusions

- Prompt and accurate diagnosis
- Identify and treat underlying cause if possible
- Consider MgSO4 for neuroprotection

Conclusions (cont’d)

- Intervene to minimize neonatal mortality and morbidity (STAT mnemonic)
  - Steroid – antenatal steroid therapy
  - Tocolytics – if indicated
  - Antibiotics – GBS prophylaxis
  - Transport