Management of Preterm Labor and PPROM

Clinical specialty: Obstetrics and Gynecology  
Intended users: Physicians and students  
Source of Evidence: The Cochrane Library and DARE

JC Objective  
To discuss the evidence for the management of preterm labor and preterm pre-labor rupture of membranes

Background

- PTL occurs between 24 and 37 weeks of pregnancy from the 1st day of the LMP. It occurs in 10% due to
  1. PPROM: (40% of cases)
  2. Chorioamnionitis
  3. Bacterial vaginosis
  4. multiple pregnancy
  5. incompetent cervix
  6. Antepartum hemorrhage
  7. Smoking
  8. Previous PTL
  9. idiopathic
  10. induced (iatrogenic)

- Diagnosis: uterine contractions (>4 contractions per 20 minutes) PLUS cervical dilation (≥2 cm in a nullipara and ≥3 cm in a multipara) and cervical effacement (>80%). Threatened PTL have uterine contractions without cervical change.

- investigations:
  - to diagnose the cause and to verify gestational age.
  - To Predict: Cervical length by TV ultrasound and fetal fibronectin testing have good negative predictive value.

- Complications:
  1. respiratory distress syndrome
  2. necrotising enterocolitis
  3. group B streptococcal infection
  4. intracranial hemorrhage
  5. hypothermia
  6. hyperbilirubinemia
  7. weak suckling
  8. high perinatal mortality rate

- Prevention:
  1. cervical cerclage, when performed in women with a singleton gestation, previous preterm birth and cervical length <25 mm, reduces the Risk of preterm birth <34 weeks.
  2. Progesterone:
     a. Progesterone versus placebo for women with a short cervix identified on ultrasound: significant reduction in the risk of preterm birth <34 weeks (one study; 250 women; RR 0.58; 95% CI 0.38 to 0.87).
b. Progesterone versus placebo for women with a past history of spontaneous preterm birth:
significant reduction in the risk of preterm birth <34 weeks' gestation (one study; 142 women; RR
0.15; 95% CI 0.04 to 0.64); preterm birth <37 weeks' gestation (four studies; 1255 women; RR
0.80; 95% CI 0.70 to 0.92); infant birthweight <2500 grams (two studies; 501 infants; RR 0.64;
95% CI 0.49 to 0.83).

Treatment

- **Tocolytic drugs**
  1. Check for contraindications to tocolysis
     a. chorioamnionitis
     b. severe PE
     c. severe APH
     d. IUFD
     e. fetal anomalies incompatible with life
  2. Types
     a. ritodrine (intravenous or oral): b-adrenoreceptor agonist. AE:
        (1) fetal: tachycardia, hyperglycemia
        (2) maternal: tachycardia, pulmonary edema
     b. Atosiban: Oxytocin antagonist. High Cost
     c. Magnesium sulfate: neuromuscular blocker. AE: Flashes, headache
     d. Nifidipine: Calcium channel blocker. AE: Hypotension
     e. Indomethacin: COX inhibitor. AE: premature closure of ductus arteriosus
  3. First line: There are no clear “first-line” tocolytic drugs to manage preterm labor. Resources, clinical
circumstances and physician preferences should dictate treatment.
  4. Benefits
     a. Tocolytic drugs may prolong pregnancy for 2 to 7 days, which allow for administration of
corticosteroids to improve fetal lung maturity and maternal transport to a tertiary care facility.
     b. Use of a tocolytic drug is not associated with a clear reduction in perinatal or neonatal mortality,
or neonatal morbidity.
     c. There is insufficient evidence for any recommendation about whether or not maintenance
tocolytic therapy following threatened preterm labor is beneficial.

- **Enhance lung maturity (between 28 & 34 weeks):**
  1. Antenatal Steroids: single course
     a. dexamethasone, 6 mg IMI repeated every 12 hours for 4 doses
     b. betamethasone, 12 mg IMI repeated once in 24 hours for 2 doses (not available in Egypt)
  2. Benefits
     a. neonatal death (RR 0.69, 95% CI 0.58 to 0.81)
     b. RDS (RR 0.66, 95% CI 0.59 to 0.73)
     c. moderate to severe RDS (RR 0.55, 95% CI 0.43 to 0.71)
     d. cerebroventricular hemorrhage (RR 0.54, 95% CI 0.43 to 0.69)
     e. severe cerebroventricular hemorrhage (RR 0.28, 95% CI 0.16 to 0.50

- Antibiotics do not appear to prolong gestation and should be reserved for group B streptococcal
prophylaxis in patients in whom delivery is imminent.
- Bed rest and hydration do not appear to improve the rate of preterm birth.
Pre-labor Rupture of Membranes

- **Definition**: rupture of membranes before initiation (onset) of labor and may occur
  1. Preterm (PPROM): before completed 37 weeks (2%).
  2. Term (8%)

- **Etiology of PPROM**:
  1. infectious causes: chorioamnionitis, cervicitis
  2. increased uterine volume: polyhydramnios, twins
  3. incompetent cervix
  4. trauma

- **Diagnosis**:
  1. history of fluid trickle or gush per vagina
  2. term: PV to assess cervical status
  3. PPROM
    a. using a sterile speculum to detect amniotic fluid in the vagina.
    b. Dipstick for fluid pH: vaginal pH 4.5, amniotic fluid pH 7.25, nitrazine paper will turn deep blue if fluid has an alkaline pH.
    c. Ultrasound: assess amniotic fluid volume.
      1. Single deepest vertical pocket: the best method
      2. Amniotic fluid index
    d. Routine Amniocentesis is NOT recommended.

**Diagnosis of chorioamnionitis**

  1. foul smelling amniotic fluid
  2. increased temperature,
  3. tachycardia (pulse >100 or fetal HR >160)
  4. uterine tenderness
  5. leukocytosis
  6. amniotic fluid contains leukocytes and bacteria.
  7. Aerobic & anaerobic culture of amniotic fluid.

- **Complications PPROM**:
  1. preterm labor
  2. chorioamnionitis: E coli, Bacteroides, GBS
  3. oligohydramnios
  4. Abruptio placenta
  5. cord prolapse
Treatment:
1. evidence of chorioamnionitis: induce labor (regardless of gestational age) plus antibiotic coverage
2. No evidence of chorioamnionitis:
   a. Term: await spontaneous onset of labor for 6-12 hours. Induce labor
   b. Preterm: conservation

Protocol of Conservation
- hospitalization, no PV, Temperature chart/4 hours, Daily leukocytic count & differential, Daily C-reactive protein

Prophylactic AB
1. Erythromycin is the best choice. Ampicillin/ sublactam is another choice
2. Amoxicillin/clavulanate (augmentin) should be avoided because of the increased risk of neonatal necrotising enterocolitis.
3. Benefits of Antibiotics for PPROM
   a. Chorioamnionitis:
      (1) RR: 0.57 (95% CI 0.37-0.86)
      (2) ARR: 10% and NNT-b: 10
   b. Neonatal infection:
      (1) RR: 0.68 (95% CI 0.53 - 0.87)
      (2) ARR: 6% and NNT-b: 17
   c. babies born within
      (1) 48 hours (RR 0.71, 95% CI 0.58 - 0.87)
      (2) seven days (RR 0.80, 95% CI 0.71 - 0.90)
   d. Neonatal O2 therapy (RR 0.88, 95% CI 0.81- 0.96)
   e. use of surfactant (RR 0.83, 95% CI 0.72 - 0.96)
   f. time in neonatal intensive care (MD -5.05, 95% CI -9.77 to -0.33)

- enhance lung maturity (between 28 & 34 weeks): Antenatal Steroids: single course
- induction of labor after 34 weeks

Management Matrix

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<tr>
<th>Uterine Contractions</th>
<th>No uterine contractions</th>
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<tr>
<td>&lt;34 wks</td>
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<tr>
<td>Augment</td>
<td>Induce</td>
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<tr>
<td>Augment + AB coverage</td>
<td>Induce + AB coverage</td>
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<tr>
<td>Senior Consultation to Consider conservation</td>
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<tr>
<td>Sterile Speculum examination Prophylactic AB Antenatal corticosteroid</td>
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<tr>
<td>&gt;34 wks</td>
<td>CA</td>
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