Educational Topic 25:
Premature Rupture of Membranes

Rationale: Rupture of the membranes prior to labor is a problem for both term and preterm pregnancies. Careful evaluation and management of this condition may improve fetal and maternal outcome.

Intended Learning Outcomes:
A student should be able to:

- List the history, physical findings and diagnostic methods to confirm rupture of the membranes
- Identify risk factors for premature rupture of the membranes
- Describe the risks and benefits of expectant management versus immediate delivery based on gestational age
- Describe the methods to monitor maternal and fetal status during expectant management

TEACHING CASE

CASE: A 26-year-old G2P0100 woman, who is 31 weeks gestation, presents to the labor unit complaining of leakage of fluid and she thinks that her “bag of water broke.” She has had increased vaginal discharge and intermittent lower back pain for the last two days. She reports a gush of fluid about 2 hours ago. The fluid ran down her leg and appeared clear with no noticeable odor. Her prior pregnancy was complicated by preterm labor and premature rupture of the membranes at 26 weeks gestation. The neonate’s course was complicated by necrotizing enterocolitis, respiratory distress, and death at 28 days of life.

COMPETENCY-BASED DISCUSSION & KEY TEACHING POINTS:
Competencies addressed:
- Patient care
- Medical knowledge

1. What risk factors are associated with premature rupture of membranes (PROM)?

- The definition of PROM is rupture of membranes before the onset of labor. Membrane rupture before labor and before 37 weeks of gestation is referred to as preterm PROM.
- Risk factors for PROM include similar risks for preterm labor:
  - Vaginal, cervical and intraamniotic infections
2. What should be the next step in this patient’s diagnosis?

• Confirmation of the diagnosis of PROM.
  • Sterile speculum examination to confirm the diagnosis
    ▪ Pooling of fluid per cervical os
    ▪ Fern – cervical mucus broad fern vs. amniotic fluid narrow fern
    ▪ pH (Nitrazine) – turns blue as the pH of amniotic fluid is usually 7.1-7.3.
      ▪ False positive Nitrazine may occur due to
        ▪ Alkaline urine
        ▪ Semen
        ▪ Blood
        ▪ Cervical mucus
        ▪ Antiseptic solutions
        ▪ Bacterial vaginosis
    ▪ Ultrasound evaluation AFI in equivocal cases – not diagnostic
    ▪ Test kits for amniotic proteins - considered ancillary to standard methods of diagnosis

3. What should be the next step in management once PROM has been confirmed?

• Assess fetal status: continuous fetal monitoring, ultrasound to assess the estimated fetal weight (EFW), amniotic fluid volume and fetal presentation
• Rule out labor (uterine activity monitoring)
• Rule out intraamniotic infection: This diagnosis may be made clinically. In some cases amniocentesis may prove helpful to rule out an intraamniotic infection. Amniotic fluid may be sent for gram stain, aerobic and anaerobic cultures, glucose and cell count.
• Obtain swabs to rule out Chlamydia trachomatis, Neisseria gonorrhea and group B streptococcal infection
• Digital cervical examinations should be avoided unless the patient appears to be in active labor or imminent delivery is planned. Digital exams are associated with an increased risk of infection and add little information to that available with speculum examination. Sterile speculum examination provides an opportunity to confirm the diagnosis of PROM, inspect for cervicitis and umbilical cord or fetal prolapse, assess cervical dilatation and effacement, and obtain cultures as appropriate.
• Once labor and intraamniotic infection have been ruled out, if patient is preterm (< 34 weeks) consider:
• Antibiotics: Ampicillin and erythromycin to prolong the latency period
• Steroids to enhance fetal lung maturation and decrease risk of RDS
• Patients with preterm PROM at a viable gestational age should be observed closely in the hospital on modified bedrest. They should be assessed periodically for evidence of infection, placental abruption, umbilical cord compression, fetal well-being, and labor. There is no consensus on the optimal frequency and type of assessment that is optimal. An acceptable strategy would include periodic ultrasound monitoring of amniotic fluid volume and daily or twice-daily fetal heart rate monitoring.

- The decision to deliver the fetus is based on gestational age and fetal status.
- If there is evidence of intraamniotic infection or evidence of fetal compromise at any gestational age, the fetus should be delivered.
- The timing of delivery may vary among institutions:
  - The patient who experiences PROM between 24 weeks and 31 completed weeks of gestation should be cared for expectantly if no maternal or fetal contraindications exist until approximately 34 weeks of gestation.
  - At 32–33 completed weeks of gestation, the risk of severe complications of prematurity is low if fetal pulmonary maturity is confirmed by amniotic fluid samples collected vaginally or by amniocentesis. Therefore, labor induction may be considered if pulmonary maturity has been documented. If pulmonary maturity cannot be established, expectant management may be beneficial.

4. What are the risks associated with preterm PROM?

- Maternal risks:
  - Chorioamnionitis
  - Cesarean delivery for malpresentation and failed induction
  - Abruption

- Fetal risks:
  - Cord prolapse
  - Respiratory Distress Syndrome
  - Necrotizing Enterocolitis (NEC)
  - Infection (sepsis)
  - Intraventricular hemorrhage- The risk for this varies with gestational age.
  - Pulmonary hypoplasia especially if < 19 weeks when PROM occurs (rare after 26 weeks gestation)
  - Skeletal deformities

5. What treatment can this patient be offered in a future pregnancy to decrease her recurrence risk for preterm PROM and preterm delivery?

- Recent studies have suggested progesterone therapy to reduce the risk of recurrent spontaneous preterm birth resulting from preterm labor or PROM.
REFERENCES

