PRETERM BIRTH PREDICTION AND INTERVENTION

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OBJECTIVES

1. To present an overview of Preterm Birth
2. To review current techniques of preterm birth prediction and intervention
3. To apply current techniques of prediction and intervention to patients at risk for Preterm Birth

PRETERM BIRTH

- Birth > 20 0/7 weeks but < 34 0/7 weeks
- Preterm Labor
- Preterm PROM
- Cervical insufficiency (incompetency)
- Not indicated preterm birth

PRETERM BIRTH

- U.S.A. 11.7% (MOD, year 2011)
- Texas 13.1% (Healthy Texas Babies)
- El Paso 14.2% (Healthy Texas Babies)
- 2009: 1,984 preterm births in El Paso

PRETERM BIRTH

- Spontaneous preterm birth is leading cause of prematurity
- 15% of all preterm birth are recurrent
- Etiology of preterm birth is heterogeneous
- Therefore, prevention and treatment must be multifactorial

Short Cervix and Preterm Birth

Women with short cervix (< 20 to 25 mm) by vaginal ultrasound examination have a 75% chance of preterm delivery!!!

Preterm Birth Prediction

1. History
2. Cervical Length
3. Fetal fibronectin

History of Preterm Birth

1. non-Hispanic white: 11%
   Hispanic: 11%
   African American: 17%
2. Number of prior preterm births: each confers a 1.5X risk in subsequent pregnancies
3. Gestational age at prior preterm birth less than 32 weeks: an additional 1.5X risk

Clinical Example

African American woman with 2 prior preterm births at 28 and 26 weeks respectively

Now pregnant; determine risk of preterm birth without intervention:

17% X 1.5 X 1.5 X 1.5 X 1.5 = 86% risk of PTB

Cervical Length

- Vaginal ultrasound between 18-24 weeks
- Shortest of 3 measurements
- CL < 25 mm
- Funneling with short cervix is not significant, CL is utmost importance

Universal Cervical Length Screening

- Controversial
- Pros: may reduce PTB rate, effective interventions are available, cost-effective
- Cons: quality assurance of screening test, geographic restrictions, unnecessary and unproven interventions

ACOG's Position

"...does not mandate universal cervical length screening in women without a prior preterm birth; (however), this screening strategy may be considered."

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Fetal Fibronectin

- Glue-like protein in membranes
- Theory is that “unstable” or “leaky” membranes are associated with an increase in preterm birth risk
- Dacron swab inserted using sterile speculum in the posterior fornix or blindly in the vagina
- Do between 22-35 weeks

Fetal Fibronectin Results

- If negative, less than 1% risk of preterm birth within the next 2 weeks
- If positive, approximately 16% risk of preterm birth within the next 2 weeks

Preterm Birth Interventions

- Recurrent PTB risk: 17-P (Makena)
- Short cervix by scan: Vaginal progesterone or cerclage
- Lifestyle changes
- Preterm Birth Prevention Clinic

17-P

- Weekly injections from 16-36 weeks
- FDA-approved: Makena (start by 20 6/7 weeks)
- ACOG-recommended (start by 24 weeks)
- Standard of Care
- Reduces recurrent preterm birth by 35%

17-P

- History of preterm birth
- Not for short cervix with no history of PTB
- Not for multiple gestations
- Not for use with vaginal progesterone
- Can be used in patients with a cerclage and history of preterm birth

17-P for Your Patients

- Usually a benefit of commercial insurance plans
- Texas Medicaid: if compounding pharmacy within 50 miles, compound 17-P; if not, Makena
- Watson Pharmaceuticals, manufacturer of Makena, will provide Makena to uninsured patients, at least at the present

Know Your Compounding Pharmacy

1. Variability in dosage, potency, and purity
2. Some patients may be allergic to oils used as the depo agent
3. Gluteal abscesses have been reported, some locally and some serious

Progesterone Gel or Suppositories

- No history of preterm birth
- Short CL found on vaginal ultrasound
- Use until 36 weeks
- Reduces preterm birth by 45%

Cervical Cerclage

- “Purse-string” stitch in cervix
- History of incompetent cervix
- Short cervix by vaginal ultrasound without a history of preterm birth
- “Stitch in time, saves nine (months)”

Useful Algorithm

- Prior loss due to CI: cerclage
- Prior preterm birth: 17-P
- Short cervix, no history, < 24 weeks: vaginal progesterone
- Prior preterm birth, on 17-P, short cervix, <24 weeks: consider cerclage

Cervical Cerclage

- McDonald cerclage: easy and effective, 0-Prolene, 1 purse-string stitch
- Shirodkar: difficult to place and remove and not more effective than McDonald
- Best not to use Mersilene band unless you have a desire to remove stitch under anesthesia

Cervical Cerclage

- Prophylactic: 10-14 weeks
- Therapeutic: up to 24-26 weeks
- Remove at 36 weeks
- PPROM: to remove or keep, controversial

Vaginal Progesterone

- 90 mg (gel) or 200 mg (suppository) daily
- Crinone 8%: 1 applicator vaginally q hs
- Crinone gel has a bioadhesive that keeps the gel attached to the vaginal mucosa

Preterm Birth Prevention Clinic

- Focuses on preterm birth prevention
- Uses state of the art diagnostics and therapeutics
- Based on Utah model that showed a 28% reduction in recurrent preterm birth

Manuck et al. Am J Obstet Gynecol 2011;204:320.e1-6

Goals of Preterm Birth Prevention Clinics

1. Reduce morbidity and mortality associated with preterm birth
2. Educate patients and providers about preterm birth prediction and interventions
3. Provide support to patients at risk for preterm birth
4. Lower healthcare costs attributable to preterm birth

Summary of ACOG Level A Evidence

- Singleton pregnancy with prior preterm singleton birth, give 17-P
- Short cervix (< 20 mm) before 24 weeks, give vaginal progesterone
- No progesterone in multiple gestations

Inpatient Management of Preterm Labor

1. Diagnosis
2. Management

Diagnosis of Preterm Labor

- Regular uterine contractions with change in dilatation, effacement, or both
- Regular uterine contractions with cervical dilatation of 2 cm on admission

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Diagnostic Aids for Diagnosing PTL

- Fetal fibronectin
- Cervical length per vaginal ultrasound

No Intervention

- 30% of patients admitted with PTL will have spontaneous resolution
- 50% of patients admitted with PTL will deliver at term
- No interventions < 24 weeks or > 34 weeks (few exceptions)
- If no cervical change, do not treat contractions

Worthless PTL Interventions

- Prophylactic tocolytic therapy
- Home uterine activity monitoring
- Cerclage, unless indicated
- Narcotic sedation
- Bed rest
- Hydration
- IV antibiotics unless documented infection or positive Group B Strept status

Effective PTL Interventions

- Antenatal corticosteroids (24-34 weeks)
- Short course of tocolytic therapy during “steroid window”
- Antibiotics for positive Group B Strept status
- Magnesium sulfate for neuroprotection

Antenatal Corticosteroids

- Standard of care since NIH Consensus Conference (1992)
- Betamethasone or dexamethasone
- Administer between 24-34 weeks
- May give one additional rescue course of steroids if > 7 days since last course (ACOG, 2011)

Short Course of Tocolytic Therapy

- Use for 48 hours or less
- Beta-adrenergic receptor agonists (terbutaline).
- Calcium channel blockers (nifedipine)
- NSAIDS if less than 32 weeks (indomethacin)

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Tocolytics

- Terbutaline: limited use, beware FDA's blackbox designation
- NSAIDS: indomethacin 100 mg rectally then 50 mg q 6 hours
- Nifedipine: preferred agent, 20 mg orally , then every 3-6 hours

Group B Strept

- Treat if positive culture
- If no culture, treat pending culture
- If arrested PTL and positive status, must treat again prior to delivery

Magnesium Sulfate Neuroprotection

- Reduces cerebral palsy by 17-45%
- Use between 24-31 6/7 weeks
- 3 protocols available: Crowther, Marret, and Rouse

Rouse Protocol

- Loading dose: 6 grams
- Maintenance dose: 2 grams/hour
- Use until delivery or for 12 hours, whichever comes first
- If < 6 hours after D/C, restart maintenance dose
- If > 6 hours after D/C, reload
- Generally, do not give additional tocolytics

The End

Thanks for your attention

Questions?