Interventions for the Prevention and Management of Prematurity

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Presentation Objectives

- Define continuum of prevention and management of preterm birth and care of the pre-term infant
- Describe the collaborative, multi-disciplinary approach to preterm birth
- List the interventions that are available now, can be adopted soon, and are on the horizon.
- Determine what can be done to advance key best practices
Drivers contributing to the increase in preterm birth rate of the United States from 1989 to 2004

50% of the increase cannot be explained

Data Sources: Chang et al Lancet 2012
- Review of preterm birth trend data (restricted to 39 high income countries with good data)

- Potential to reduce rates based on current evidence based interventions (mostly applicable to risks and health systems in high income settings), but also some middle income countries e.g., smoking

- **Bottom line:** in 39 high income countries the potential for preterm birth prevention is VERY SMALL at about 5%

- URGENT need to examine preterm birth syndrome and understand and develop solutions especially for spontaneous preterm birth

- EVEN more urgent for low income settings as likely much greater scope possible in addressing high infection load in pregnancy, adolescent pregnancy, birth spacing etc
Collaborative Approach
Maternal & Newborn Health Teams Working Together

- Multiple providers
- Complementary roles
- Additive impact

<table>
<thead>
<tr>
<th>ACTION</th>
<th>PROVIDER</th>
<th>IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention of preterm birth</td>
<td>Antepartum care provider</td>
<td>Reduce number of preterm births</td>
</tr>
<tr>
<td>Management of Conditions that lead to preterm birth</td>
<td>Skilled birth attendant</td>
<td>Reduce the complications of preterm birth</td>
</tr>
<tr>
<td>Care of the newborn born prematurely</td>
<td>Newborn care provider</td>
<td>Reduce the mortality of complications from prematurity</td>
</tr>
</tbody>
</table>

Maternal interventions with fetal / newborn benefit
Stages of Prevention / Care

1. **Prevention of Preterm Birth**
   - Universal, simple preventative actions that are known to reduce chance of PTB
   - Avoidance of practices that lead to PTB

2. **Management of Preterm Birth**
   - Identification of precursors to PTB and early action
     - Antepartum hemorrhage, Severe PE/E, Preterm pre-labor rupture of membranes, pre-term labor, maternal illness
   - Interventions to lessen the morbidity of PTB

3. **Care of Preterm Newborn**
   - Providing best care to reduce the complications of PTB
Risk factors associated with the increased risk of preterm birth can guide us especially as limited evidence regarding interventions that are relevant for low income settings.

**Strong evidence of risk leading to preterm birth and low birthweight**
- Tobacco use
- Infectious disease – STIs, HIV/AIDS, rubella
- Poor mental health and intimate partner violence

**Moderate evidence of risk leading to preterm birth and low birthweight**
- Pregnancy in adolescence
- Birth spacing – short interval, long intervals
- Pre-pregnancy weight status – underweight, overweight
- Chronic diseases – diabetes mellitus, hypertension, anemia

**Weak evidence of risk leading to preterm birth and low birthweight**
- Micronutrient deficiencies – folic acid, iron

Source: Born Too Soon
Interventions to address high burden of disease

**Interventions:**
- Ready for scale up now
- Cheap and available, but not widely used
- Future considerations, due to cost and complexity
Interventions available now

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Description</th>
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</table>
| Improvement in pregnancy dating                                               | Protocol for clear EDD determination  
Clear documentation and communication to woman  
Protocol for clear EDD determination  
Clear documentation and communication to woman |
| Identification of women at risk of preterm birth                              | PTB Consciousness: Starting a PTB Protocol for Antepartum hemorrhage (placenta previa, abruptio placenta); severe PE or eclampsia; PPROM; PTL; maternal illness. |
| Antenatal Corticosteroids                                                     | A single course, administered to women between 24 and 34 (37?) weeks who are at risk for early delivery within 7 days; continuation protocol during transport |
| Early transfer to higher level center                                          | Mother/uterus is the best transport vehicle. Clear communication and referral protocols                                                                                                                  |
| Preparation of birthing environment                                           | Specially trained team approach, preparedness for interventions                                                                                                                                             |
| Avoid early Cesarean                                                          | Policy of no elective cesarean before 39 weeks. No elective C/S without excellent gestational age determination                                                                                             |
## Accessible Interventions

**Simple and cheap, but not widely used**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Screening and treatment for reproductive tract infections</td>
<td>Treatment of syphilis, gonorrhea and chlamydia.</td>
</tr>
<tr>
<td>Screening and treatment of urinary tract infections, other infections</td>
<td>UTI $\rightarrow$ Pyelonephritis $\rightarrow$ Preterm birth</td>
</tr>
<tr>
<td></td>
<td>Malaria, tuberculosis and HIV may increase risk of preterm birth</td>
</tr>
<tr>
<td>Administration of magnesium sulfate for neuroprotection of newborn</td>
<td>Can result in 30% reduction in incidence of cerebral palsy in surviving newborns when birth is anticipated before 32 weeks gestation</td>
</tr>
<tr>
<td>Tocolysis for preterm labor</td>
<td>For short-term prolongation of pregnancy to allow 48 hours of antenatal corticosteroids, administration of magnesium and transport</td>
</tr>
<tr>
<td>Better management of preterm prelabor rupture of membranes</td>
<td>Increase period between rupture and delivery.</td>
</tr>
<tr>
<td></td>
<td>NO digital exams. Give 2 days of ampicillin + erythromycin IV then 5 days of amoxicillin + erythromycin orally.</td>
</tr>
<tr>
<td>Identification of intra-amniotic infection and treatment</td>
<td>Chorioamnionitis should be treated with ampicillin and gentamicin, and induction of labor for delivery</td>
</tr>
<tr>
<td>Family planning</td>
<td>Promotion as maternal &amp; newborn health intervention</td>
</tr>
</tbody>
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# Future Interventions

*More complex and expensive*

<table>
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<tr>
<td><strong>Group antenatal care</strong></td>
<td>Model in USA called “Centering Pregnancy” has demonstrated a reduction in preterm birth.</td>
</tr>
<tr>
<td><strong>Progesterone supplementation</strong></td>
<td>For women with a history of preterm birth, progesterone supplementation during pregnancy can reduce recurrence.</td>
</tr>
<tr>
<td><strong>Ultrasound measurement of cervical length</strong></td>
<td>Short cervix alone is not a good predictor of preterm birth, but can be used in combination with history, examination and symptoms.</td>
</tr>
<tr>
<td><strong>Cervical cerclage</strong></td>
<td>In select women with a known incompetent cervix, a cerclage may be useful for prolonging pregnancy.</td>
</tr>
<tr>
<td><strong>Delayed cord clamping for preterm newborn</strong></td>
<td>Has been shown to be beneficial in reducing intracranial hemorrhage.</td>
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### Interventions known to be ineffective

<table>
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<tr>
<td>Antibiotics for intact membranes</td>
</tr>
<tr>
<td>Tocolysis among women with preterm contractions but no cervical change</td>
</tr>
<tr>
<td>Maintenance tocolytic therapy (after acute therapy)</td>
</tr>
<tr>
<td>Bed rest, hydration and sedation for preterm contractions or preterm labor</td>
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<tr>
<td>Regular repeat courses or multiple courses of corticosteroids</td>
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</table>
Broader context

Other clinical situations with higher rates of PTB

- Adolescent pregnancy
- Pregnancy among women > 35
- Closely spaced pregnancies
- Multiple pregnancies
- Stress, gender-based violence
- Maternal obesity, smoking, etc.

Interventions

- Pre-conception care
- Delayed first birth, PPFP
- Careful infertility protocols
Programs to address preterm birth

- WHO Global guidelines / recommendations
  - To be developed in 2013

- Advocacy:
  - Local: National Prematurity Day 17 November
  - Global: BTS Report, ACS on EML

- Capacity:
  - Quality improvement / training on known and available interventions

- Monitoring:
  - Collection of key indicators
References:

- ACOG Practice Bulletin #80, Premature Rupture of Membranes. ACOG, Washington, DC April 2007
- ACOG Committee Opinion #475, Antenatal Corticosteroid Therapy for Fetal Maturation. ACOG, Washington, DC February 2011
Thank you!

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