Enhanced Prenatal Care for Twin Pregnancy

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Funding for this project is provided in part by The Duke Endowment
Learning Objectives

▪ Review unique complications of twin pregnancies
▪ Describe enhancements to prenatal care to optimize outcome in twin
  ▪ Nutrition and weight gain
  ▪ Fetal assessment and ultrasound monitoring
  ▪ Approach to preterm birth
  ▪ Timing and route of delivery

Funding for this project is provided in part by The Duke Endowment
Background

- 2014 U.S. twin pregnancy rate : 33.9/1000
- Increased obstetric and maternal complications
  - Gestational HTN (2-3 x increase)
  - Gestational diabetes
  - Iron deficiency anemia
  - VTE
  - Congenital anomalies – 3-5 x increase in monochorionic twins
  - Preterm birth (56% vs 9.7%)
  - Low birth weight

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Background

The ‘average’ twin is born preterm (35.2 weeks EGA) and low birth weight (2323 grams)

- Enhancements to prenatal care
  - Prolong pregnancy/reduce PTB
  - Increase birthweight
  - Reduce maternal/perinatal morbidity

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Twin Pregnancy Expertise

- Engage HROB/MFM with experience in multifetal pregnancy at time of diagnosis
  - Obtain consult or refer for dichorionic placentation
  - Refer for:
    - Monochorionic placentation
    - Higher order multifetal pregnancy
    - Fetal anomaly, discordant fetal growth, discordant amniotic fluid volume, fetal death after 16 weeks of gestation

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Early Prenatal Care Enhancements

- Baseline screening
  - Early diabetes screen: BMI > 25, prior GDM, age > 35, PCOS
  - Baseline serum ferritin; urine protein assessment, serum creatinine, AST/ALT

- Supplementation
  - Low dose aspirin (81 mg daily) starting 12 weeks EGA

- Each visit
  - Blood pressure, maternal weight, urine proteinuria
  - PTL s/s review after 20-22 weeks

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Nutrition enhancements

▪ Calorie requirement: + 250 calorie/day/fetus
  ▪ 30-50 calories/kg/day
    ▪ 3 meals, 3 snacks
  ▪ Composition
    ▪ 20-30% protein
    ▪ 30% fats
    ▪ 40% carbohydrates

▪ Nutritionist consultation

▪ Lactation consultation

▪ Micronutrient supplement
  ▪ PNV + iron (30mg daily)
    ▪ Omega 3-FA 300-500 mg DHA/EPA daily
    ▪ 2-3 servings of low-mercury fish per week
  ▪ Folic acid 1 mg daily
  ▪ Ca 1,500-2,500 mg daily
  ▪ Vitamin D 1000 IU daily
# Maternal weight gain

- **BMI-specific weight gain goals**
  - Prolonged pregnancy
  - Increased birth weight
  - Without post partum weight retention

<table>
<thead>
<tr>
<th>Pre-pregnancy BMI</th>
<th>Total wt gain (kg)</th>
<th>Total wt gain (lbs)</th>
<th>Initial suggested daily calorie intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5 kg/m²</td>
<td>17-25*</td>
<td>37-54*</td>
<td>42-50 cal/kg/day</td>
</tr>
<tr>
<td>18.5 – 24.9 kg/m²</td>
<td>17-25</td>
<td>37-54</td>
<td>40-45 cal/kg/day</td>
</tr>
<tr>
<td>25.0-29.9 kg/m²</td>
<td>14-23</td>
<td>31-50</td>
<td>30-35 cal/kg/day</td>
</tr>
<tr>
<td>&gt;=30 kg/m²</td>
<td>11-19</td>
<td>25-42</td>
<td>30 cal/kg/day</td>
</tr>
</tbody>
</table>

* Extrapolated recommendations and specific recommendations not given by IOM
Ultrasound/ fetal assessment

- All twins: US 11-14 weeks
  - Confirm EGA

- Embryo transfer dating
- LMP

- Confirmation by US at 10-14 weeks, using CRL:
  - If CRL A and B are < 10 mm different, use smaller CRL
  - If CRL A and B are > 10 mm different, use larger CRL (high risk of early growth issues/aneuploidy in this setting in the smaller twin)
Ultrasound/ fetal assessment

▪ All twins: US 11-14 weeks
  ▪ Confirm EGA
  ▪ Determine chorionicity
Determine Chorionicity

- Determine risk of complications/surveillance
  - Di/Mo-chorionic, Di/Mo-amniotic
- Ultrasound 11-14 weeks optimal
  - Λ or T-sign
  - Gender
  - Placental mass
- If unsure, manage as monochorionic

http://medical-dictionary.thefreedictionary.com/twin
Chorionicity matters!

Monochorionic twins

- Increased risk:
  - Selective fetal growth restriction
  - Growth discordance
  - Discordant fetal anomalies
  - Twin-twin transfusion syndrome
  - Neurologic morbidity
- Fetal death:
  - < 24 weeks: 12.7% (2.5% DC)
  - > 24 weeks: 4.9% (2.8% DC)

- Require specific pregnancy monitoring

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Ultrasound/ fetal assessment

- All twins: US 11-14 weeks
  - Chorionicity
  - Confirm EGA
  - Aneuploidy screening
    - MC: maternal age risk
    - DC: 2x maternal age risk
- Combined serum and nuchal translucency screening at 11-14 weeks EGA
- Maternal serum screen at 15-20 weeks EGA
- CVS at 11-14 weeks
- Amniocentesis at > 15 weeks
  - Cell free fetal DNA currently not recommended in twins
  - MSS < 4-6 weeks from twin loss not recommended
Dichorionic twins

- Fetal ‘targeted’ anatomy survey 18-20 weeks EGA
  - Fetal echo if IVF pregnancy
- US q 3-4 weeks for fetal growth
  - Abnormal growth:
    - EFW < 10\textsuperscript{th} % tile
    - Discordant EFW > 20%
- Antenatal testing in absence of growth abnormalities of unproven benefit
Monochorionic twins

- US for MVP of Amniotic fluid q 2 weeks from 16 weeks EGA
  - Abnormal AFV defined as MVP < 2 cm and/or MVP > 8 cm
    - Prompt referral to fetal center with twin pregnancy experience
  - Fetal ‘targeted’ anatomy survey 18-20 weeks EGA | fetal echo
- EFW assessment q 3-4 weeks
  - Abnormal growth
    - EFW < 10th % tile
    - Discordant EFW > 20%
- Weekly fetal testing from 32 weeks
## Summary of Twin US Surveillance

<table>
<thead>
<tr>
<th>Weeks EGA</th>
<th>11 0/7 – 13 6/7</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>26</th>
<th>28</th>
<th>30</th>
<th>32</th>
<th>33</th>
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<th>36</th>
<th>37</th>
<th>38</th>
</tr>
</thead>
</table>

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PTB prediction in twins

Predicts

- Cervical length (20-24 weeks EGA)
  - < 20 mm
    - PTB < 32 weeks 42.4%
    - PTB < 34 weeks 62%
  - < 25 mm
    - PTB < 28 weeks 26%
  - > 25 mm
    - PTB < 28 weeks 1.4%
    - Birth > 37 weeks 63.2%
- FFN
- Prior PTB

Does not predict/prevent

- HUAM
- Bedrest/activity restriction
- Biochemical markers
- Routine hospitalization

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### Twin Preterm Birth Prevention

#### Asymptomatic, unselected twins

- Review s/s PTB
- Corticosteroids in setting of high risk of delivery < 7 days
- Frequent provider contact
- Not recommended (level I-II)
  - Planned bedrest
  - 17 OHP
  - Cerclage or pessary
  - Oral tocolytics
  - Universal cervical length screening/serial cervical length screening/FFN screening

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Current twin with prior preterm birth

- 17 OHP or cerclage may be individualized based on traditional indications
Current twin with asymptomatic short cervix
- < 25 mm
- 18-24 weeks EGA

- Not beneficial:
  - 17 OHP
  - Cerclage

- May be beneficial:
  - HROB/MFM referral
  - Vaginal progesterone
  - Arabin-type cervical pessary
Twin Preterm Birth Prevention

Current twin with asymptomatic cervical dilatation, 18-23 weeks EGA

- Highly selective cerclage, antibiotics may provide prolongation of pregnancy
  - HROB/MFM referral

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Delivery timing

- **Di/Di**: 37 0/7 - 38 6/7 weeks
  EGA – favor 38 0/7 weeks
- **Mo/Di**: 36 0/7 – 37 6/7 weeks
  EGA – favor 37 0/7 weeks
  - Complicated - individualize
- **Mono-amniotic** – 32-34 weeks

- **ACOG**
  - Di/di - 38 0/7 – 38 6/7
  - Monochorionic – 34 0/7 – 37 6/7
- **NICHD (Spong, et al Obstet Gynecol 2011)**
  - 38 weeks di/di
  - 34-37 weeks mo/di
  - 32-34 weeks monoamniotic
- **NICE guidelines**
  - Di/di twin pregnancy – 37 0/7
  - Monochorionic – 36 weeks (after corticosteroids)

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Delivery route

Cephalic / Non-cephalic

EFW >1500gram
Concordant EFW (<25%) or B smaller
Experienced operator
Consider delivery in OR setting w anesthesia

Yes

Cesarean of both

No

Vaginal delivery of both

Cesarean of both

Vaginal delivery A
Breech extraction of B

Both cephalic

First twin breech, Mono-amniotic, conjoined twins

Both cephalic

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Prenatal Care for Twins

- Risk factor screening | nutrition | weight gain
- Chorionicity/EGA
- Fetal assessment
- Chorionicity based fetal monitoring
- Preterm birth prevention approach
- When/how to deliver
- Referral for high risk care as needed

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References

Questions?

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