



Gestational Diabetes

PUTTING GUIDELINES
INTO PRACTICE

February 13th, 2009

Acknowledgments

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Web page: www.diabetesedu.org

Web page:
<http://www.cdphe.state.co.us/pp/diabetes/index.html>

Presenters



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Objectives

- ☆ Recognize risk factors for GDM and discuss methods for preventing the development of GDM
- ☆ Relate the Colorado Clinical Guidelines for GDM to practice
- ☆ Recognize client challenges and barriers to adequately care for GDM
- ☆ Identify educational tools and resources for available use with clients
- ☆ Discuss the long-term risk of GDM in the development of type 2 diabetes for both mother and child

Definition of GDM

- ☆ Gestational Diabetes Mellitus (GDM) is glucose intolerance recognized for the first time during pregnancy.
- ☆ This does not currently recognize the difference between pre-existing diabetes identified for the first time during pregnancy and diabetes that develops due to the pregnancy



Why Does It Develop?

- ☆ Insulin transports glucose from blood into cells
- ☆ Placental hormones and inflammatory cytokines (TNF-a) cause worsening insulin resistance in the late 2nd trimester – intended to shunt nutrients to the fetus
- ☆ Women are unable to produce enough insulin to overcome the overwhelming resistance and maintain euglycemia
- ☆ If body cannot keep up with ↑ demand → ↑ glucose in the blood → Gestational Diabetes

Why Be Concerned?

- ☆ Maternal Concerns
 - ◆ Increased intensity of medical care
 - ◆ Higher risk of infections, C-section
 - ◆ **~50% Maternal risk of developing type 2 Diabetes in 5-10 years!!**
- ☆ Infant Concerns
 - ◆ Increased central obesity
 - ◆ Risk of stillbirth
 - ◆ Problems regulating glucose & may need NICU
 - ◆ Enlargement of pancreas, heart and liver
 - ◆ **↑ risk for developing childhood obesity and type 2 "adult onset" diabetes**



* Slide adapted from Dr. Linda Barbour, 12.6.06

Risk Factors



- ☆ High-Risk if any of the following:
 - ◆ Advanced maternal age (≥ 35 y.o.)
 - ◆ Obese (BMI > 29 kg/m² based on PPW)
 - ◆ High-risk ethnic population
 - Asian/Pacific Islander, American Indian, Hispanic, Black
 - ◆ Prior history of GDM
 - ◆ Previous macrosomic infant
 - Birth weight is > 4000 g (8# 13oz.)
 - ◆ History of GDM related obstetric complications
 - ◆ First degree relative with diabetes
 - Parent, sibling, child
 - ◆ Polycystic Ovary Syndrome (PCOS)
 - ◆ Glycosuria

GDM Prevention

- ☆ Client is "High-Risk", what can you do?
 - ◆ Early glucose screening
 - ◆ Educate on healthy eating & exercise
 - ◆ Track weight gain
 - ◆ Tell her about the risk of GDM



Colorado Clinical Guidelines on Gestational Diabetes

Developed by the Colorado Clinical Guidelines Collaborative
and the Diabetes Prevention and Control Program
at the Colorado Department of Public Health and Environment
November 2006

Early Screening Protocol for High Risk Women

- ☆ 50-g, 1-hour Oral Glucose Challenge Test (OGCT) when risk factors are identified
- ☆ If OGCT ≥ 135 mg/dl, follow with 3-hour Oral Glucose Tolerance Test (OGTT)
- ☆ If positive OGTT, there is suspicion of pre-existing diabetes
- ☆ If 1-hour OGCT < 135 mg/dl or values on 3-hour OGTT are normal, then re-screen between 24-28 weeks

Universal Screening at 24-28 weeks

- ☆ Screen **all** women for GDM between 24-28 weeks with a 50-gram, 1-hour OGCT
- ☆ If OGCT is < 135 mg/dl, no further testing required
- ☆ During the last trimester insulin needs are 2-3x higher
- ☆ Follow diagnostic criteria



Diagnosis of GDM¹

- ☆ 3-hour OGTT is the diagnostic test
- ☆ If 2 or more values meet or exceed these values, then diagnose GDM:
 - ◆ Fasting Blood Glucose \geq 95 mg/dl
 - ◆ 1-hour \geq 180 mg/dl
 - ◆ 2-hour \geq 155 mg/dl
 - ◆ 3-hour \geq 140 mg/dl

¹ American Diabetes Association, Carpenter and Coustan

For OGCT \geq 200 mg/dl

- ☆ You may test serum fasting blood glucose (FBG) prior to conducting the 3-hour test
 - ◆ If serum FBG is $<$ 95 mg/dl, continue with OGTT
 - ◆ If serum FBG is \geq 95 mg/dl, woman has GDM and no OGTT is necessary.

Only 1 Elevated Value?

- ☆ Recommend physical activity and provide nutrition counseling
- ☆ If OGTT was prior to 24 wks, wait to rescreen between 24-28 wks
- ☆ If OGTT was between 24-28 wks, repeat 3-hour OGTT in another 3-4 wks
 - ◆ Glucose intolerance increases as pregnancy progresses, 30% of women subsequently develop GDM

Blood Glucose Management Tools

- ☆ Medical Nutrition Therapy
- ☆ Exercise
- ☆ Blood Glucose Monitoring
- ☆ Medication Management
- ☆ Prenatal Surveillance



Medical Nutrition Therapy

- ☆ Assess
 - ◆ Individualize plan based on client's caloric needs and weight gain to date
- ☆ Instruct
 - ◆ Teach carbohydrate counting, healthy food choices, appropriate weight gain
- ☆ Evaluate
 - ◆ Review food and blood glucose records to assess compliance

Exercise

- ☆ Recommend physical activity, if no contraindications
- ☆ Aim for 30 minutes/day, 5 days/week
- ☆ Benefits include \downarrow insulin resistance, \downarrow postprandial hyperglycemia and prevention of excessive weight gain



Self-Monitoring of Blood Glucose (SMBG)

- ☆ 4x/day; fasting and 1 or 2-hours pp
- ☆ Collect reliable values for a minimum of 1-2 weeks before considering medication
- ☆ Rotate SMBG if frequency is decreased
- ☆ Never discontinue SMBG during pregnancy, glucose intolerance increases as pregnancy progresses

SMBG Goals

- ☆ Fasting <95 mg/dl
- ☆ 1 hour postprandial <130-140 mg/dl
- ☆ 2 hour postprandial <120 mg/dl

Medication Management with Insulin

- ☆ NPH plus the rapid-acting insulins Lispro (Humalog) OR Aspart (Novolog) have been shown to be most effective
- ☆ NPH plus Regular have been used safely in pregnancy as well
- ☆ Glargine (Lantus) is not yet recommended because further study is needed
- ☆ SMBG should guide dosage and timing

Medication Management with Oral Agents

- ☆ Glyburide
 - ◆ Not FDA approved, but off label use has increased in last decade
 - ◆ Likely to fail in women diagnosed < 24 weeks, fasting BG > 110mg/dl, morbidly obese and advanced maternal age (≥ 35 y.o.)
- ☆ Metformin
 - ◆ Inconclusive evidence to recommend use after 1st trimester
 - ◆ Contraindicated with IUGR, placental insufficiency and preeclampsia

Prenatal Surveillance

- ☆ Daily "kick counts" at 28 weeks
- ☆ Prenatal testing (type of test left to discretion of practitioner)
 - ◆ Euglycemic: may delay until 40 weeks
 - ◆ Not euglycemic, no meds: initiate at 36 wks
 - ◆ Medication-controlled: initiate at 32-34 wks
 - ◆ Other complications: may initiate sooner



Fetal-Based Strategy

- ☆ \uparrow fetal abdominal circumference (AC) on an ultrasound conducted between 28-34 weeks
 - ◆ Correlates with \uparrow amniotic fluid insulin levels, a marker of poor maternal glycemic control
 - ◆ Indicates development of excess subcutaneous fat and visceral fat in the fetus
- ☆ Tighten glycemic control if the fetal AC is >75th percentile
- ☆ Relax slightly if the fetal AC is completely normal



Client Challenges & Barriers



Imagine...



Emotions

- ★ Afraid
- ★ Anxious
- ★ In denial
- ★ Concerned
- ★ Confused
- ★ Angry
- ★ Scared
- ★ Alone
- ★ Overwhelmed
- ★ Frustrated
- ★ Guilty
- ★ No Control
- ★ Intimidated
- ★ Helpless
- ★ Sad
- ★ Worried



Barriers

- ★ Transportation
- ★ Health insurance
- ★ Financial concerns
- ★ Learning level
- ★ Physical discomforts
- ★ Food insecurity
- ★ Family support
- ★ Cultural differences
- ★ Medical jargon
- ★ Language
- ★ Ability to cook
- ★ Change is difficult
- ★ Other support systems
- ★ SMBG 4x/day
- ★ Depression
- ★ More appointments
- ★ Time off of work
- ★ Mixed messages



Solutions

- ★ Be patient's advocate
- ★ Tell them it's not their fault
- ★ Take time to explain
- ★ Good listening skills
- ★ Engage family
- ★ Offer follow-up
- ★ Provide education appropriately
- ★ Acknowledge emotions
- ★ Be culturally aware
- ★ Provide referrals for support
- ★ Financial assistance



Educational Tools & Resources



GDM Toolkit



- ☆ Colorado Clinical Guidelines
- ☆ 1-hour and 3-hour Instruction Sheet
- ☆ My Diabetes Record
- ☆ GDM Flowsheet
- ☆ Weight Gain Grid
- ☆ Postpartum Flyer & Reminder Card
- ☆ Educational Materials
 - ◆ Diabetes Education Society – Making Everything Right™ patient booklet & curriculum
 - ◆ International Diabetes Center – Gestational Diabetes patient book & curriculum

Web Resources

- ☆ **American Diabetes Association**
 - ◆ <http://diabetes.org/home.jsp>
- ☆ **Calorie King**
 - ◆ <http://www.calorieking.com/>
- ☆ **Colorado Clinical Guidelines Collaborative – GDM Guidelines**
 - ◆ <http://www.coloradoguidelines.org/guidelines/gestationaldiabetes.asp>
- ☆ **Determining BMI and Appropriate Weight Gain**
 - ◆ www.healthy-baby.org
- ☆ **Diabetes Education Society**
 - ◆ www.diabetesedu.org
- ☆ **International Diabetes Center Materials**
 - ◆ www.parknicollet.com/healthinnovations/
- ☆ **Joslin Diabetes Center**
 - ◆ <http://www.joslin.org/>
- ☆ **National Diabetes Education Program**
 - ◆ <http://ndep.nih.gov/index.htm>
- ☆ **National Institute of Child Health & Development**
 - ◆ www.nichd.nih.gov/publications/pubs/gest_diabetes/

Long Term Risk



Postpartum Risk

- ☆ **Crucial** that women return to their provider for follow-up
- ☆ All women following GDM pregnancies have **50% risk of developing type 2 diabetes** within 5-10 years
- ☆ Those with Impaired Glucose Tolerance or Impaired Fasting Glucose have an **80% risk of developing type 2 diabetes**

Risk to Child



- ☆ Infants born to mothers with GDM, regardless of their actual weight, have increased body fat and decreased lean body mass¹
- ☆ Siblings born to Pima Indian women prior to developing diabetes vs. siblings born to same women with GDM²
 - ◆ By age 25-29, 20% risk of developing type 2 diabetes for 1st child (no GDM in pregnancy)
 - ◆ By age 25-29, 70% risk of developing type 2 diabetes for 2nd child (GDM during pregnancy)

¹ Catalano, AJOG 2003

² Dabelea, Knowler, Pettitt J MFM 2000:9:93

Steps to Take

- ☆ Inform client about risk of type 2 diabetes for self and child
- ☆ Encourage breastfeeding
- ☆ Encourage weight loss within 6 to 12 months
 - ◆ If overweight/obese, work to lose 5-7% of body weight slowly, over time
- ☆ Schedule a 75-g 2-hour OGTT 6-12 weeks postpartum
- ☆ Educate on effective contraception

Postpartum Reclassification Criteria

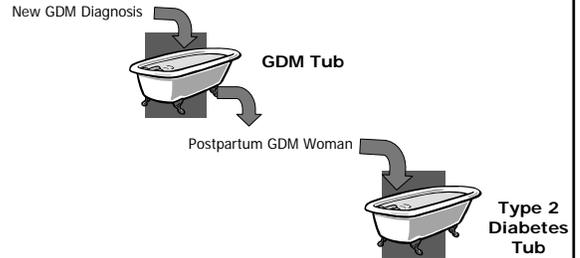
Time	Normoglycemia	Pre-diabetes	Type 2 Diabetes Mellitus
Fasting	< 100 mg/dl	≥ 100 mg/dl and < 126 mg/dl Impaired Fasting Glucose	≥ 126 mg/dl
2-hour	< 140 mg/dl	≥ 140 mg/dl and < 200 mg/dl Impaired Glucose Tolerance	≥ 200 mg/dl

*American Diabetes Association criteria

Diagnose Type 2 Diabetes Mellitus
with either a fasting ≥ 126 mg/dl
OR a 2-hour ≥ 200 mg/dl

Overflowing the System

☆ What can we do to change this?



Thank You!

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