The Sunshine of New Life

Taking Care of Gestational Diabetes

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Outline

- Physiology
- Implications for mother and unborn child
- Criteria for diagnosis and treatment goals
- Treatment
  - Nutrition
  - Exercise
  - Medication
- Post partum recommendations
- Educational model

What is gestational diabetes?

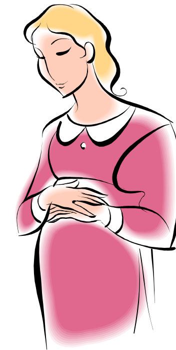
- Glucose intolerance with onset or first recognition during pregnancy
- May be diabetes in “evolution”
- Second and third trimester insulin needs increase due to:
  - Existing chronic insulin resistance
  - Effect of placental hormones.
  - Increased hepatic glucose production
  - Inability of pancreas to meet insulin demand

Prevalence

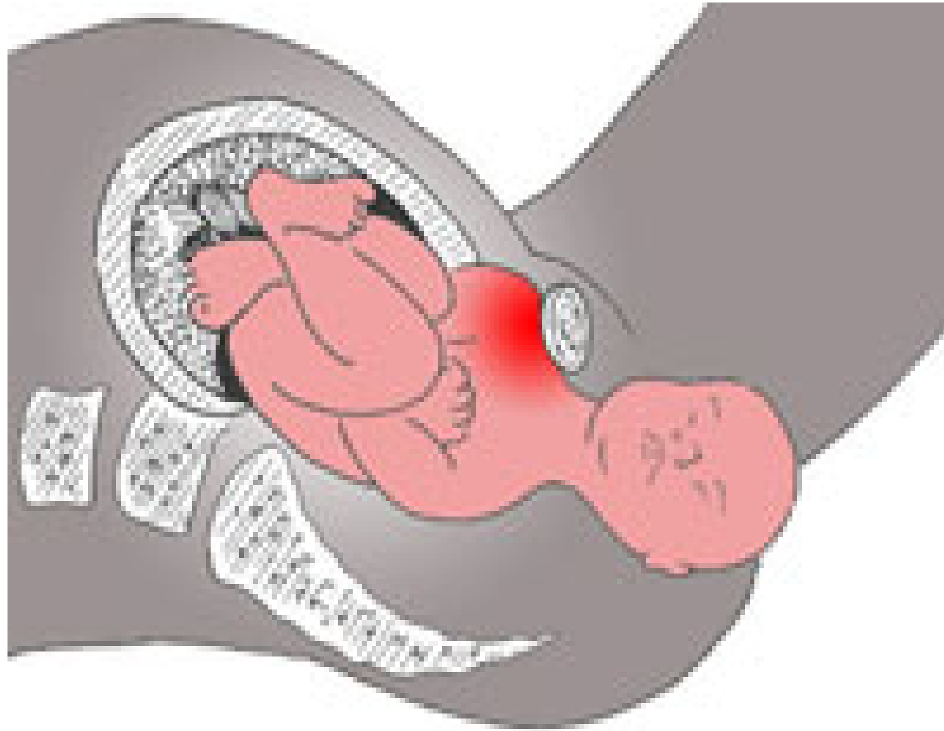
- 200,000 cases annually
- Observed in 7% of all pregnancies
- More prevalent in obese women, women with family history of diabetes, Hispanic/Latino , African Americans, Native Americans and Pacific Islanders
- 20%-50% will develop type 2 diabetes in the next 5-10 years
- 2 of 3 will have again in future pregnancies
    - National Institutes of Health 2005.

Short term risks to mother

- Higher birth weight baby
- Increased risk for developing hypertension
- Polyhydramnios
- Preterm delivery/Cesarean section



Shoulder dystocia



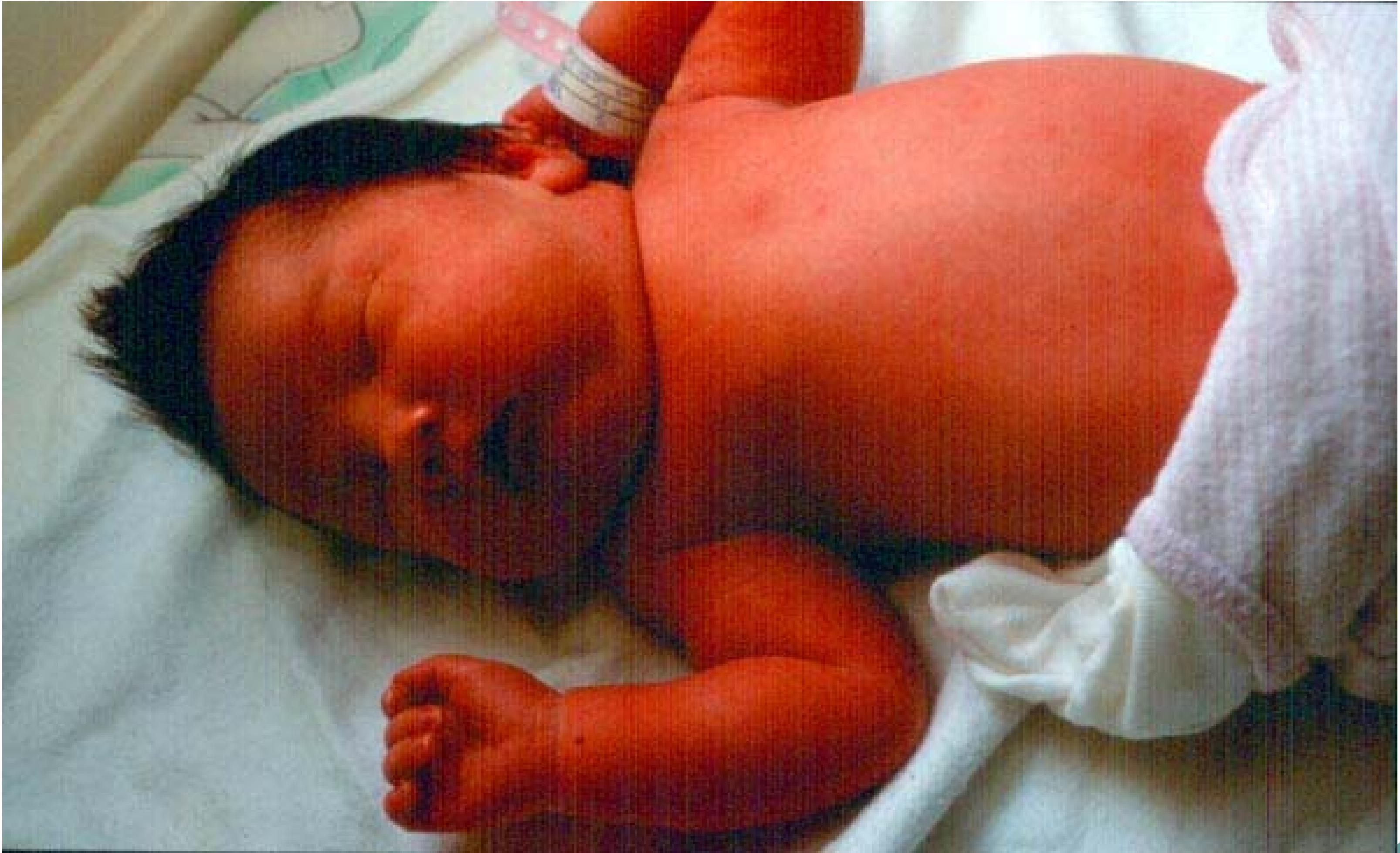
Long term risk to mother

- Gestational diabetes in future pregnancies
- Risk of developing type 2 diabetes later in life
- Risk of developing hypertension later in life

Short term risks for infant

- Macrosomia
- Hypoglycemia
- Hyperbilirubinemia
- Respiratory distress syndrome

Macrosomia



Long term risk to infant

- Obesity and development of diabetes later in life
- Risk factors for children to develop DM

  Family history of diabetes

  Typically aged 10-19

  Overweight

  Not physically active

  Slightly more for girls vs boys

  Poor eating habits

  Minority—African-American, Hispanic, Latino, American Indian, Asian American or Pacific Islander

When to screen?

Risk assessment at first prenatal visit

Low Risk	High Risk
< 25 yrs.	Severe obesity
Normal weight	Prior GDM
Ethnic group	Prior LGA baby
No DM in 1st degree	Presence of glucosuria
No hx of abnormal GTT	PCOS
No nx of poor OB outcome	Strong fm hx DM

Average risk-test at 24-28 weeks.

A. D. A.

Screening

- Usually done at 24-28 weeks gestation
- 50 gram glucose challenge for screen
- One hour level should be less than 140
- If above 140 mg/dl-go on to 3 hr OGTT

(140 is 80% sensitive

130 is 90% sensitive)

A.D.A. Practice Guidelines 2008.

Diagnostic tests

3 hour, 100 gram glucose tolerance test:

- Fasting >95
- 1 hour >180 (two values out of range
- 2 hour > 155 for diagnosis)
- 3 hour > 140

Performed after an overnight fast of at least 8 hours.

A.D.A. Practice Guidelines 2008.

Common Concerns

- Interesting to know how the mother was told of the diagnosis
- Questions she may ask:
  - Will my baby have diabetes?
  - Is it because I ate too much sugar?
  - Will it go away?
  - Will this harm the baby?
  - What will be the financial burden?

Testing at home

- Home blood glucose monitoring
  1. Monitor may be dictated by insurance
  2. Be sure mother knows how to do the test accurately
  3. Use a meter with a memory
  4. Timing of postprandial test

- Ketone testing

Goals for control

	Fasting	1 hour	2 hour
ACOG	<95	130-140	<120
ADA	<105	<155	<130
ACE	60-90	<120	
Joslin	<100	<130	
Sweet Suc.	65-100	110-135	<120
Ours	<95		<120

Treatment

Goals of food management

1. Achieve and maintain normoglycemia
2. Provide adequate energy for normal fetal growth and avoid maternal ketosis
3. Nutrients consumed for maternal and fetal health are provided by food

ADA Nutrition Practice Guidelines 2001

Food Management

IOM BMI range kg/m2	Kcal/kg pre-preg weight	Recommended Weight gain
Underweight <19.5	36-40	28-40
Normal 19.8-26	30	25-35
Overwt 26.1-29	24	15-25
Obese >29	Net <1800	>1=15
Twins		35-45
Triplets		45-55

Treatment

- Exercise
  - Increases insulin sensitivity
  - Keep in mind fitness level of mother
  - Light or moderate intensity
  - Use energy conservation
  - Exercise after a meal
  - Avoid overheating

Oral Agents

- Concerns

  Congenital anomalies

  Induction of fetal macrosomia due to direct stimulation of the fetal pancreas resulting in hyperinsulinemia

  Increased rate of hypoglycemia due to fetal hyperinsulinemia

Treatment-oral agents

- Sulfonylureas

  Glyburide

  - Category B
  - Does not cross placenta
  - Is not excreted in breast milk
  - Peak plasma level within 4 hrs
  - Major side effect-hypoglycemia

Treatment-oral agents

- Biguanides

  Metformin

  - Inhibition of hepatic glucose production
  - Improves tissue sensitivity to insulin
  - Category B
  - Crosses the placenta
  - Excreted in breast milk

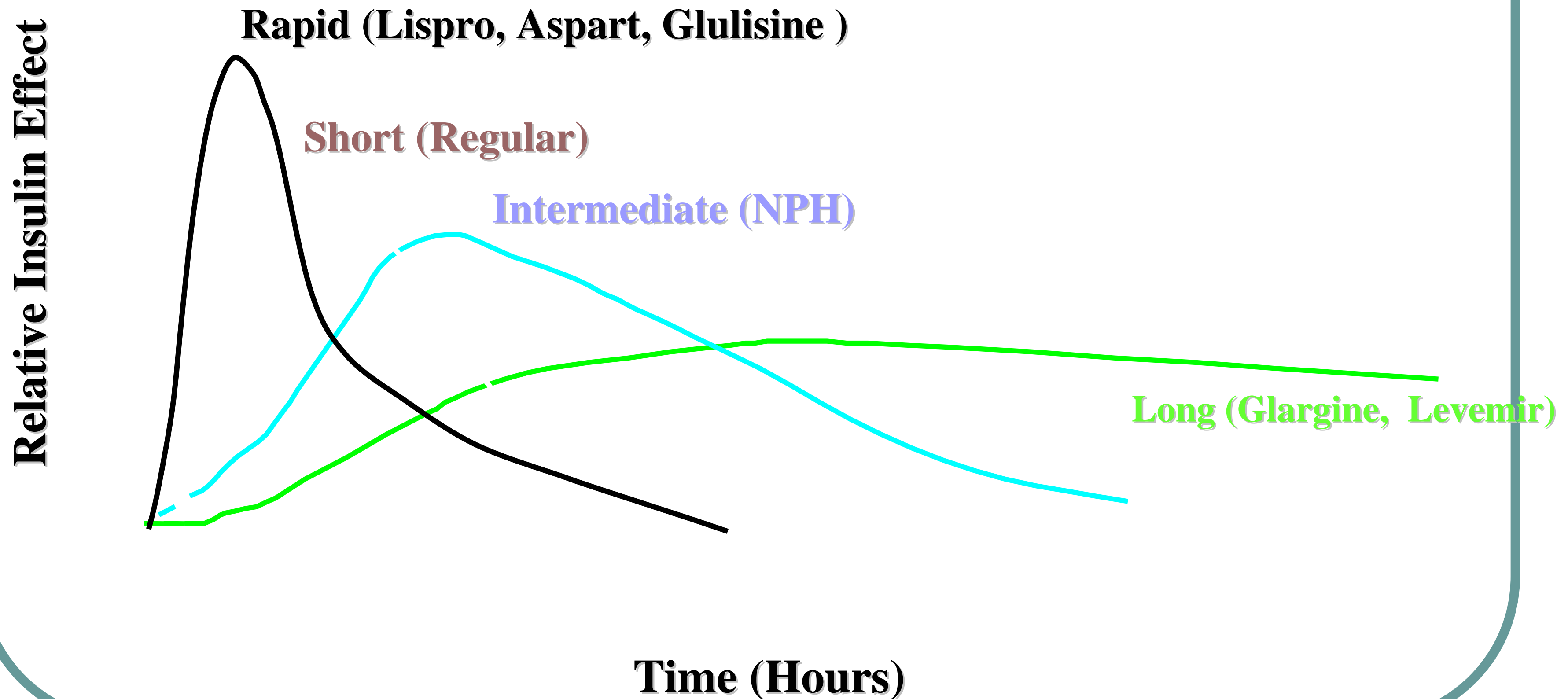
Concerns when starting insulin

- Fear of needles
- Fear that the insulin will harm the baby
- It hurts !
- I will gain weight
- "My uncle went on insulin and lost his toe a month later"
- "I will pass out from low blood sugar"
- Fear that insulin needle will poke baby if injected in abdomen

Insulins

- Rapid-acting
  - Aspart (Novolog)
  - Lispro (Humalog)
  - Glulisine (Apidra)
- Short-acting
  - Regular
- Intermediate acting
  - NPH
- Long-acting
  - Glargine (Lantus)
  - Levemir (Detemir)

Insulin Time Action Curves



Post partum care

- Screening

  FBS vs glucose tolerance test

  Done at 6-12 weeks post partum

  Recommendation:

  75 gm. 2 hour OGTT

Post partum care

- Breastfeeding

  -Recommended

  -Advantages

  Nutritionally superior food
  Bacteriologically safe
  Contents include anti-infectious factors
  Least allergenic of any infant food
  Less likely to lead to problem of baby being overfed
  Promotes good jaw and tooth development
  Costs less than commercial formulas
  Promotes close mother-child contact
  Generally more convenient when process has been established
  Decreased risk to infant of developing obesity and diabetes later in life
  Increased calorie requirement for the mother, promoting insulin sensitivity and weight loss
  Decreased future risk of breast and ovarian cancer

Post partum care

- Weight loss

  -First goal: pre-pregnancy weight

  -Second goal: reassess weight status

  BMI

  Waist-to-hip ratio

Post partum care

- Diet and exercise

  -Diabetes Prevention Trial

  -5 to 7% weight loss

  with a healthy meal plan and 150

  minutes of exercise per week

  -58% reduced risk for type 2 diabetes

Post partum care

- Future pregnancies

  Pre-conception care

  Don’t forget “pre-diabetes” and its implications for pregnancy

Post partum care

- Ongoing care through life

  -Major life style change for mother and family

  -Long term

  -Should be a transition vs instant "perfection"

  -Insulin sensitizers

Strategies

- Be a role model (eat well, exercise)
- Eat meals at the table
- Do not make food a reward
- Limit TV, video games and computer time
- Watch weight of all family members
- Provide family exercise time
- Cut calories by drinking water instead of soda or juice and eating smaller portions
- Offer fresh fruit for snacks rather than candy or chips

The "Joslin Way"

- Referred by Dr.
- 2 hr class
- One week follow-up
- If starts insulin, follow-up per telephone every 3-4 days for 2 weeks, return to clinic for 2 week visit, return to Dr.

Challenge

- For the patient
- For us
- For the future

Questions