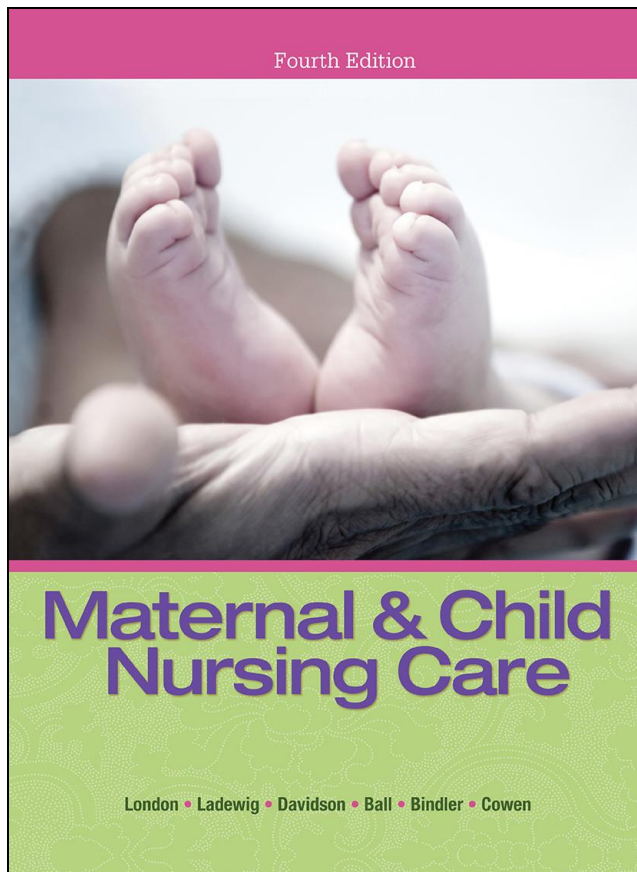


MATERNAL & CHILD NURSING CARE

FOURTH EDITION



CHAPTER 15

Pregnancy at Risk: Pregestational Problems

Learning Outcome 15-1

Discuss the pathology, treatment, and nursing care of pregnant women with diabetes mellitus.

Types of DM in pregnancy

- Type 1 diabetic women : due to B-cells destruction → absolute insulin deficiency
- Type 2 diabetic women: more common
Range from insulin resistance to secretory defect → insulin deficiency
- Gestational Diabetes Mellitus (GDM)

Gestational Diabetes Mellitus (GDM)

- A biochemical disturbance of glucose tolerance first diagnosed during pregnancy.
- 4% of pregnant women
- Occurs in about 7% of U.S. pregnancies

Pathology of Diabetes Mellitus (DM)

- Endocrine disorder of carbohydrate metabolism
- Results from inadequate production or utilization of insulin
- → glucose stays in bloodstream (hyperglycemia) → attracts intracellular fluids into vascular system →
- Cellular & extracellular dehydration
- Breakdown of fats & proteins for energy → ketones & fatty acids

Pathology of Diabetes Mellitus (DM)

4 common signs & symptoms:

- 1.
- 2.
- 3.
- 4.

Homework!

Metabolic changes in pregnancy

1st trimester:

- Pregnancy hormones stimulates beta cells to increase secretion of insulin → decrease blood glucose (FBS decrease by 10%) → hypoglycemic state
- But gluconeogenesis & transfer of glucose through placenta maintain fetal glucose levels
- By 10h wks, embryo secretes its own insulin at levels to maintain glucose obtained from the mother

Metabolic changes in pregnancy

In 2nd half of pregnancy:

- Secretion of human placental lactogen (hPL) & Prolactin+ elevation of other hormones (cortisol & glycogen)
- Increase resistance to insulin & decrease glucose tolerance

Insulin resistance: is glucose-sparing mechanism to ensure available supply of glucose for the fetus

Metabolic changes in pregnancy

- In the third trimester of pregnancy :
 - Fetal growth accelerates
 - Maternal & fetal metabolic demands increase
 - Increased hepatic production of glucose
 - Decrease tolerance to glucose
 - Insulin resistance increases
 - Maternal insulin requirements increase until 36 wks & drops down at placenta expulsion.

Metabolic changes in pregnancy

- Pregestational, or gestational impairments of glucose metabolism adversely affect control of blood sugar levels, resulting in hyperglycemia

Effect of Pregnancy on Carbohydrate Metabolism

- Early pregnancy (hypoglycemic state)
 - Increased insulin production and tissue sensitivity
 - The need for insulin decreases as fetal needs are minimal & woman may consume less food (N+V)
- Second half of pregnancy
 - Insulin requirement increase
 - Increased maternal insulin resistance

Maternal Risks with DM

- Hydramnios: due to increase amniotic glucose levels or fetal hyperglycemia & polyuria.
- Preeclampsia-eclampsia
- Preterm labour
- Ketoacidosis
- Retinopathy
- Increased susceptibility to infections due to disrupted CHO metabolism alter body resistance to infection

Fetal/Neonatal Risks with DM

- Perinatal mortality
- Congenital anomalies
- Macrosomia
- IUGR
- RDS
- Polycythemia (high # RBCs)
- Hyperbilirubinemia

Gestational Diabetes Mellitus (GDM) – High-Risk Factors

- Prior history of GDM
- Prior birth of LGA infant
- Marked obesity
- Hypertension
- Strong family history of type 2 DM

continued on next slide

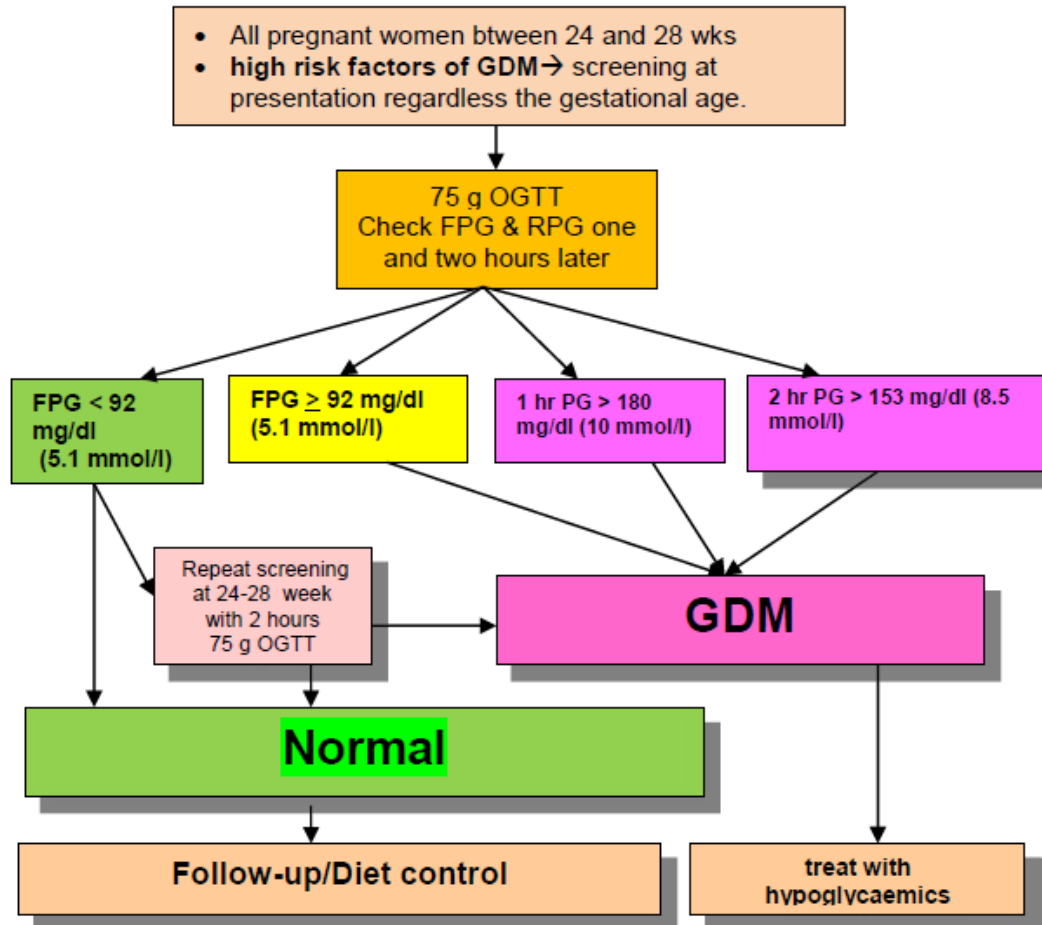
Screening & Diagnosis according to local protocols

- All pregnant women screened at 24-28 weeks
- If there is a high risk of GDM based on multiple clinical factors, screening should be offered at any stage in the pregnancy

continued on next slide

Screening & Diagnosis according to local protocols

Figure 1: One step approach for the screening and diagnosis of GDM.



Treatment Goals

- Maintain physiologic equilibrium of insulin availability and glucose utilization

Box 2 : target glucose values

Target glucose values

Fasting PG < 92 mg/dl (5.1 mmol/L)

1h postprandial PG < 140 mg/dl (7.8 mmol/L)

2h postprandial PG < 120 mg/dl (6.7 mmol/L)

continued on next slide

Treatment Goals

- Ensure optimally healthy mother and newborn
 - Awareness of changes to expect during pregnancy
 - Strict blood glucose control before conception & during first trimester
 - Potential referral to specialists

Dietary Recommendations for Pregnant Women with Diabetes

- Increase caloric intake by about 300 kcal/day
- Caloric requirements for normal weight woman
 - About 30 kcal/kg of ideal body weight (IBW) during first trimester
 - About 35 kcal/kg IBW during second and third trimesters

Glucose Monitoring

- Essential for determining insulin needs and assessing glucose control
- Glucose monitoring
 - Regular monitoring by primary care provider
 - Frequent self-monitoring
- Keep HbA1c below 6.5 % especially before 13 weeks' gestation.

Figure 15-2 Home glucose monitoring. The nurse teaches the pregnant woman with gestational diabetes mellitus how to do home glucose monitoring.



Insulin Administration Requirements

- Gestational diabetes
 - May need insulin to maintain normal glucose levels
- Pregestational diabetes
 - Typically have type 1 diabetes and are already on insulin
- Human insulin least likely to cause allergic reaction

continued on next slide

Insulin Administration Requirements

- Combination of intermediate and regular insulin may be administered
- Recommended insulin regimens vary
- No oral hypoglycemic agents currently FDA-approved for use during pregnancy

Antenatal care

- Antenatal visits of two-week interval from 20 weeks till 34 with FBS, PPBS then weekly till delivery.
- Kick chart daily from 34 weeks

Assessment of Fetal Status

- Alphafetoprotein (AFP)
- Ultrasound
- Fetal biophysical profile (BPP)
- Daily maternal fetal status evaluation
- Nonstress testing (NST)
- Contraction stress test (CST)

Antepartum Nursing Care

- Teach the woman with pregestational diabetes about expected pregnancy-related changes
- Carefully consider risks and benefits of prescribing any medications
- Emphasize strict glucose control before conception and during first trimester

Timing of the Birth

- Most women with any type of diabetes are allowed to go to term with spontaneous labor
- Induction of labor
 - May be indicated @37+ weeks to avoid problems related to decreased perfusion as the placenta ages

continued on next slide

Timing of the Birth

- Cesarean birth
 - May be indicated if evidence of nonreassuring fetal status
- Birth before term may be indicated for women with diabetes experiencing:
 - Vascular changes
 - Worsening hypertension
 - Evidence of IUGR

continued on next slide

Timing of the Birth

- Preterm birth, often by cesarean, must be considered if prenatal testing indicates deteriorating fetal condition

Intrapartum Nursing Care – Labor Management

- Hourly measurement of maternal glucose levels
- Control maternal glucose levels
- Prevent neonatal hypoglycemia
- Administer insulin if needed
 - Additional insulin may not be needed during second stage of labor and immediate postpartum period

Local Protocol

- Patients admitted for control blood sugar, should started be started on diabetic diet and Blood Sugar Profile(BSP)
- Fasting blood Sugar, 1 hour postprandial (Post lunch, post supper), & pre-bed (FBS, 1 pm, 7 PM, 11:30 PM)

Local Protocol

▣ Sliding, Scale

Blood Sugar	Sub cutaneous Regular Insulin
< 150 mg/ dl	No Insulin
150 - 200 mg/dl	4 Units
201 - 250 mg/dl	8 Units
251 - 300 mg/dl	12 Units
301 - 350 mg/dl	16 Units
Level of > 350 mg/dl you need to consultant Physician	

Nursing Management – Postpartal

- Assessment of glucose—maternal insulin requirements drop significantly
- Breastfeeding encouraged

Postpartal Nursing Care – Glucose Control

- Insulin requirements usually decrease postpartum
- Postpartal women with GDM seldom need insulin
- Elevated glucose levels may be treated with oral antihyperglycemic
 - Oral antihyperglycemics contraindicated if breastfeeding

continued on next slide

Postpartal Nursing Care – Glucose Control

- Reassessment 6 weeks postpartum to determine whether glucose levels are normal
 - If glucose normal, reassess at a minimum of 3-year intervals (ACOG, 2009)

✓ *Women with GDM should be screened with a 75 g OGTT between 6 weeks and 6 months postpartum to detect prediabetes and diabetes status.*

Postpartal Nursing Care – Building Parent-child Relationship

- High priority during the postpartum period
- If newborn requires special-care nursery, educate and encourage parents to be involved in newborn's care
- Breastfeeding encouraged

Postpartal Nursing Care – Self-care

- Home blood glucose monitoring
- Family planning education for woman and partner

END