Diabetes mellitus during pregnancy

By

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Out line

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- Types
- Diabetogenic effect of pregnancy
- Metabolic changes during pregnancy
- Risk of uncontrolled DM on pregnancy
- Diagnosis and evaluation
- Medical management
- Nursing management

Definition of Diabetes mellitus:

It is inability to metabolize glucose properly.

It is a chronic systemic disease, manifesting metabolic and vascular changes affecting every organ in the body.

prevalence

Is a major health issue that poses its risk on pregnancy. It is prevalence has been globally increasing.

Incidence

4-14% of pregnancies .90% are gestational diabetes.

Types :

a. ***Pregestational (preexisting) diabetes***

Occurs when have type 1 or type 2 diabetes before becoming pregnant.

1-Type I Insulin-dependent (IDDM) (Insulin deficient).

2-Type II Non-Insulin dependent (NIDDM) (Insulin resistant).

b. ***Gestational diabetes mellitus (GDM).***

Occurs diabetes when becoming pregnant.

Diabetogenic effect of pregnancy

Diabetes may appear only during pregnancy due to :-

1-Increased levels of antiinsulinas (estrogen, progesteron, human placental lactogen, and prolactine).

2-Decreased renal threshold for glucose (glucose loss in urine).

Metabolic changes during pregnancy

- **During early stage of pregnancy: Maternal hypoglycemia.**
- **After the fourth month: increase glucose level in the blood due to placental hormones**
- **During labor: liability to hypoglycaemia.**
- **After delivery: glucose level return to prepregnant state.**

Gestational Diabetes

Risk Factors

- **Maternal age >25**
- **Family history**
- **Glucosuria**
- **Prior macrosomia**
- **Previous unexplained stillbirth**

Risk of uncontrolled diabetes on pregnancy

A- Maternal effect:

On pregnancy	On labor	On puerperium
-Abortion	- premature labor	-puerperal sepsis
-PET	- Inertia	-PPH
-Polyhydramnios	- Operative delivery	- Abnormal lactation
-Pressure symptom		
-Infection		
-Retinopathy		

Risk of uncontrolled diabetes on fetus

1- Abortion

2- Congenital anomalies

- **Open neural defect, CHD, renal anomaly, sacral agenesis, small left colon syndrome**(Approximately 40% to

50% of infants with this disorder have diabetic mothers, almost all of whom are insulin dependent **, , imperforated anus.**

3- Macrosomia

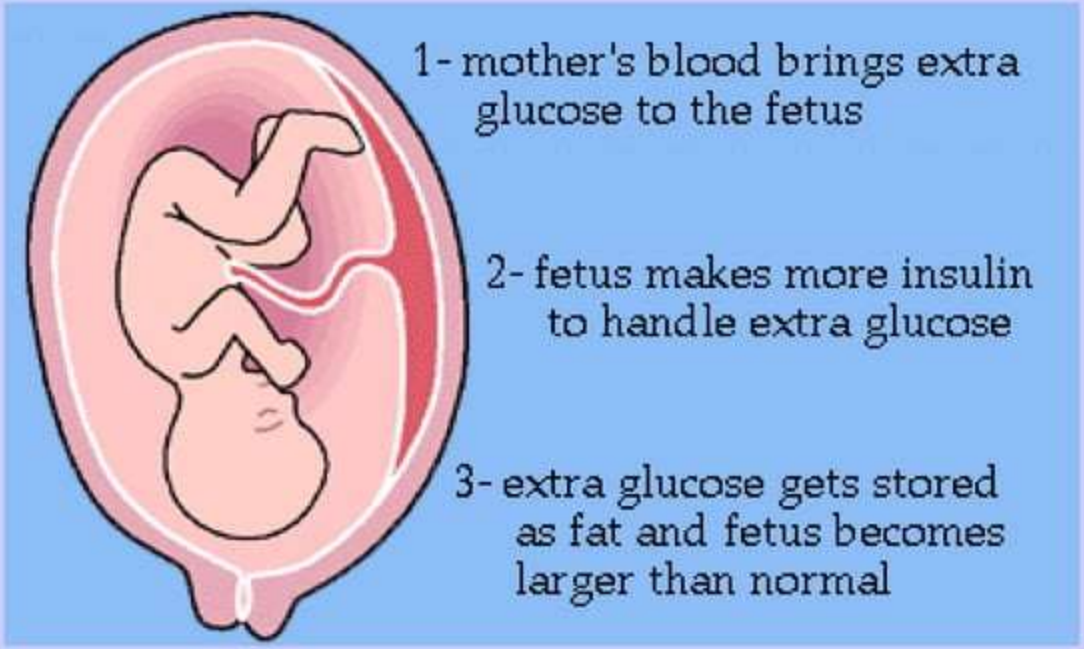
Fetal hyperglycaemia causes increase insulin secretion and lead to increase fetal fat deposition

Open neural defect

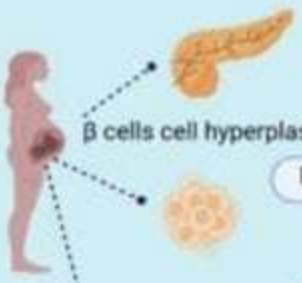
sacral agenesis

Macrosomia

Macrosomia


1- mother's blood brings extra glucose to the fetus
2- fetus makes more insulin to handle extra glucose
3- extra glucose gets stored as fat and fetus becomes larger than normal

Macrosomia



β cells cell hyperplasia

Target Cell

Insulin

Insulin resistance

Hyperglycaemia

Glucose to the fetus

Growth of the baby

Fetal macrosomia

High blood glucose caused Hyperglycaemia

Hyperglycaemia stimulates β cells to secrete more insulin

Insulin targets cells in maternal tissue to uptake more glucose resulting in Insulin resistance

Placenta secretes various hormones that inhibit the functioning of insulin

Insulin resistance occurs due to blood glucose not being taken efficiently resulting in Hyperglycaemia

The increase in blood glucose circulates in fetal blood which leads the fetal pancreas to secrete its own insulin

Fetus tissue uptake of more glucose causes fetal macrosomia

Risk of uncontrolled diabetes on fetus

4- Intrauterine fetal death due to:

Congenital malformation, ketoacedosis, hypoglycaemia, superimposed PET.

5- Neonatal hypoglycemia

After delivery, glucose concentration fail, while neonatal insulin level remain high lead to neonatal hypoglycemia (Tremors, pallor, apnea, cyanosis)

Risk of uncontrolled diabetes on fetus

7- Hyperbilirubinaemia

Due to immature liver

8- Neonatal death due to:

Congenital anomalies, prematurity, hypoglycaemia, RDS, birth injuries

Diagnosis

 # Symptoms

Polydepsia, polyphagia, polyurea

 # History :Past history of diabetes

- Family history

-Obstetric history; still birth ,macrosomia,

or recurrent abortion

- Vaginitis

Diagnosis

General examination:

- Fundal level
- Bl.p (preeclamcia common in diabetes)

Laboratory diagnosis:

1- Glucose screening test (GST)

2- Glucose tolerance test (GTT)

3- Haemoglobin A1c (glycosylated HB)

4- Urine for sugar, protein, and kitone bodies

Laboratory diagnosis:

Glucose screening test (GST)

Time: At first visit for high risk cases

At 26W for all other women

Method: 50g glucose orally $ blood

sample after one hour

Result: 140mg /dl = normal

>140mg/dl = perform GTT

Laboratory diagnosis:

Glucose tolerance test (GTT)

Method: pt. is fasting for 8-14 h then ingests 100gm of glucose

Result: normal when fasting =105 ,after 1h = 190, after 2h = 165, after 3h =145

Diagnosed diabetes if 2 value or more was more than normal

Laboratory diagnosis:

Haemoglobin A1c (glycosylated HB)

- **Importance: It reflect blood glucose concentrations during the preceding 4-12 weeks.**
- **High level of HbA1c early in pregnancy is associated with congenital anomalies.**
- **Normal result is < 7- 8.5%.**

Medical management

A- Mother: Assessment of the disease complication .

1- Opthalmoscopy -----› retinopathy

2- Kidney function test-----› nephropathy

3- ECG-------› cardiopathy

Medical management

B- Fetus:

1-Maternal serum fetoprotien (16-18W)----› increased if there is fetal malformation ; nural tube defects

2- Assessment of fetal well being as:

- Ultrasound-----› fetal weight , growth, and Biophysical profile

- Non stress test (FHR hear after fetal movement)

- Contraction stress test (by nipples stimulation or oxytocin infusion)

Medical management

3-Assessment of fetal lung maturity:

* Amniocentesis

1- Lethicine/ Sphingomyelin (L/S)ratio; result 3.5 - 1 or more is accepted.

2- Phosphatidyl glycerol (PG) ; presence after 35w means lung maturity

Medical management

C- The disease:

- Obstetrician and diabetes specialist together are responsible for the management of the diabetic women .
- Insulin dose are determined according to the severity of the disease
- Insulin dose are adjusted according to the stage of pregnancy.

Nursing management

A- Before conception

B- during pregnancy

C- Intrapartum

D- Postpartum

E- Care of new baby

Nursing management

A- Before conception

*The disease should be good controlled

*Oral hypoglycemia should be discontinued before conception

*Women who have complication may advised to not become pregnant.

Nursing management

B- During pregnancy

1- Blood glucose monitoring: by blood glucometers level should be checked before meals, two hour postprandial, and at bed time.

2- Insulin; recommendation about type of insulin, its refrigeration, site of injection, changing the site of injection, avoid using alcohol, and teaching self injection

Nursing management

3- Nutrition

- The average daily intake 2000-2500 Kcl .

- Fibers: decreases postprandial hyperglycaemia; 20-30g .

- 3 meals & 3-4 snacks is essential, emphasis on the bed time snack

- Keeping a diet dairy.

Nursing management

4- Exercise

Benefits: - Decrease cardiovascular risk

- Lower insulin requirement

*** session lasting 20-45 mins 3 days/w is recommended.**

*** regular exercise session are more effective**

*** Time : after meal not after insulin.**

Nursing management

5- Hygienic care:

Personal hygiene, care of teeth, skin, feet, avoiding vaginal infection.

6-Monitor& record fetal movement

7- Recognize the S&S and management of hypo and hyperglycaemia

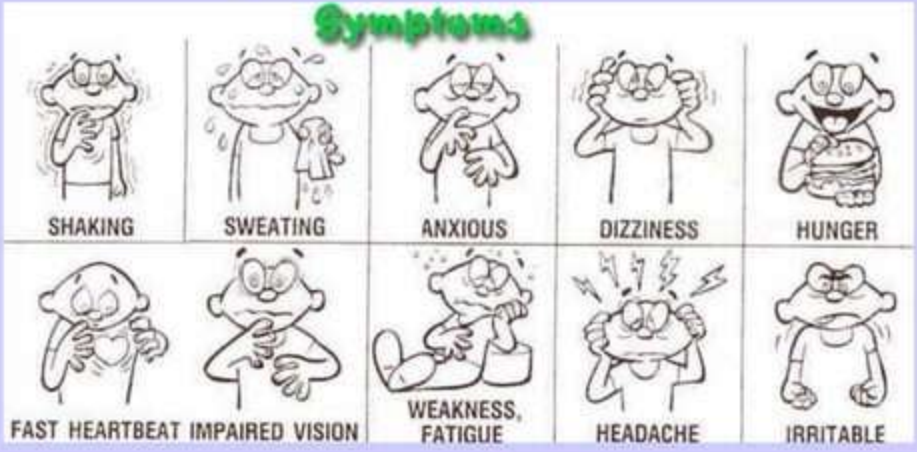
Nursing management

S&S of hypoglycaemia :

Hunger, nausea, headache, sweating, weakness, numbness around lips, loss of consciousness.

Management : glass of milk, or juice flowed by protein to prevent drop again.

Hypoglycaemia



CAUSES:	Too little food, too much insulin or diabetes medicine, or extra exercise.
ONSET:	Sudden, may progress to insulin shock.
BLOOD SUGAR:	Below 70 mg/dL. Normal range: 70-115 mg/dL
WHAT TO DO?	Drink a cup of orange juice or milk or eat several hard candies Test Blood sugar Within 30 minutes after symptoms go away, eat a snack e.g. sandwich, and a glass of milk Contact doctor if symptoms donâ€™t stop

Nursing management

S&S of hyperglycaemia :

Polyuria, polydipsia, polyphagia, neuritis, itching, weight loss

Management: - Insulin

- Medical help

Nursing management

S&S of ketoacidosis:

Severe dehydration, rapid respiration, acetone smell respiration, positive urine test for acetone. FBS >250 mg.

Management:

- **High fluid intake**
- **Medical help**

Nursing management

C- Intrapartum

- **Admission** 34- 36 w, to assess fetal well being & placental function test.
- **Terminated at** 38w to prevent chance of IUFD.
- **Termination before** 37w if:

*PIH *repeated ketosis *large fetus

*Advanced retinopathy *past IUFD

*Renal comp. *poor fetal well being

Nursing management

Management during labor :

1- Measure glucose level /1-2 h maintained at 80- 100mg/dl.

2- IV glucose + 40 mg short acting insulin +20 unit regular insulin

{No long acting insulin within 48h before delivery}

3- Frequent diet to prevent ketosis

4- Antibiotic usually prescribed to avoid infection.

Nursing management

D- Postpartum

1- Monitor BG level / 4h.

2- Insulin treatment; the dose usually as prepregnant by the second day

[No long acting insulin during first 48h]

3-Encourage breast feeding& increased calories 500-800.

4- Stop breast feeding if ketonuria present or persist .

5- Contraception; barrier method or ligation.

Nursing management

E- Care of the baby

[baby is considered as premature infant]

***Keep infant in incubator for 2 day**

***B.S estimation**

***If hypoglycemia (<25mg/dL)give 10% glucose Iv or oral**

***Management of complication.**