

# What is diabetes?

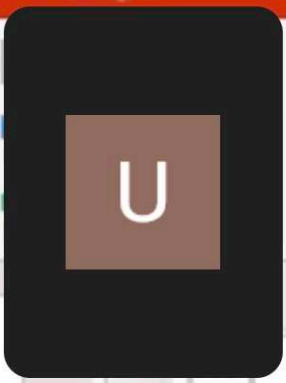
Diabetes is a chronic health condition that affects how your body turns food into energy (glucose) & released into blood stream

Blood sugar → signals pancreas → release insulin → acts like a key to let blood sugar into body cells for use as energy

Body either does not make enough insulin or can't use the insulin it makes  
→ too much blood sugar stays in blood stream



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1

**DIABETES IN PREGNANCY**

Dr. Hama Tahseen  
Associate Professor ob/gyn

2

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    graph TD
      A[Heart disease] --- B[Vision loss] --- C[Kidney disease]
  
```

3

**Diabetes by numbers**

- 463 million adults have DM worldwide
- Pakistan ranked third in prevalence of DM following China & India
- Pakistan accounts for 35 million people with diabetes in 2021, where 12.4 million US adults have DM
- It is the seventh leading cause of death in the US
- It is the top 3 cause of kidney failure, lower limb amputations & total blindness

4

**PREVALENCE OF DIABETES**

# Types of diabetes

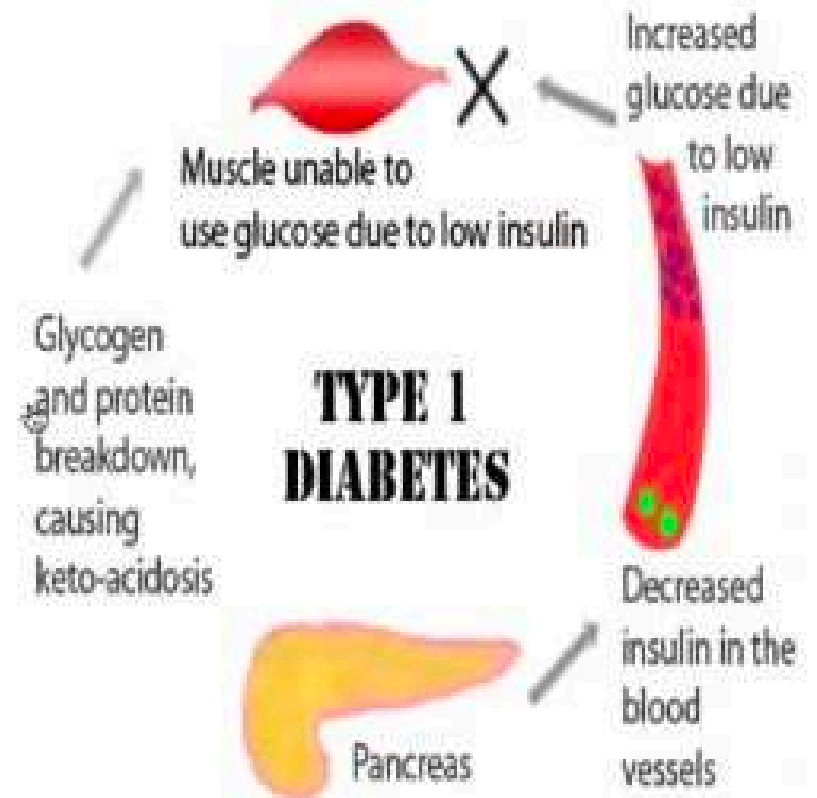
3 main types

1. **Type 1** (insulin dependent DM)
2. **Type 2** (Non- insulin dependent DM)
3. **Gestational DM**

## • PRE-EXISTING INSULIN DEPENDENT DIABETES MELLITUS (IDDM)

### Type 1-DM

- ❖ Autoimmune reaction--> stops body from making insulin
- ❖ 5-10%
- ❖ Diagnosed in children, teens & young adults
- ❖ Need to take insulin every day to survive



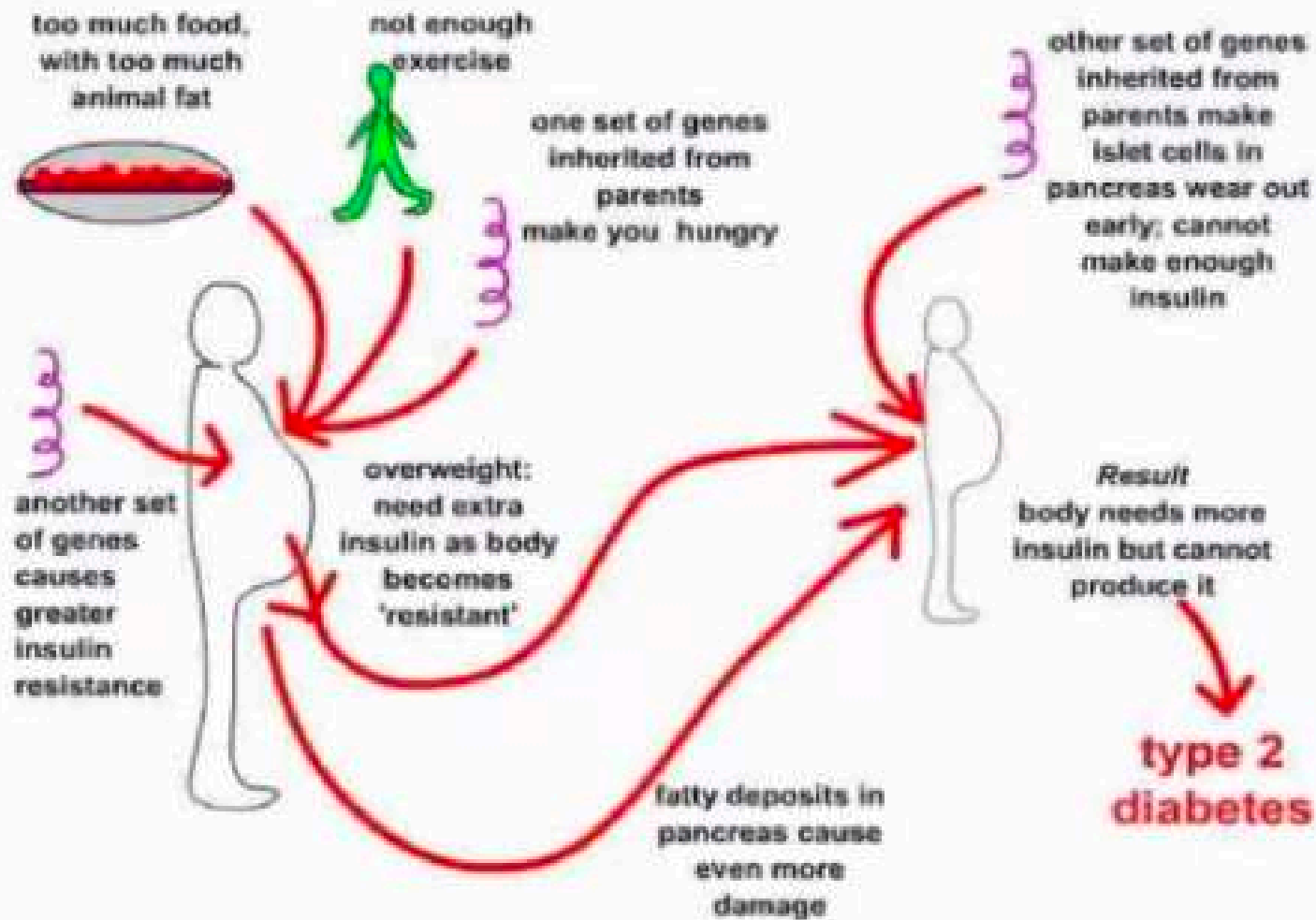
## • NON- INSULIN DEPENDENT DIABETES MELLITUS (NIDDM)

### Type 2- DM

- ❖ Body does not use insulin well & can't keep blood sugar at normal levels
- ❖ 90-95% of people have type 2 DM

#### Can be prevented by:

- ❖ Healthy life style changes
- ❖ Losing weight
- ❖ Eating healthy food
- ❖ Being active



## • GESTATIONAL DIABETES MELLITUS (GDM )

- ❖ Develops in pregnant women who have never had DM
- ❖ Usually goes away after baby is born
- ❖ Increases risk of type -2 DM in later life



# DIABETES

## Pre-pregnancy Counselling

- Best possible glycemic control before conception
- Educate the patient about the implications of pregnancy
- Folic Acid 5 mg ( pre-conception to 12 wk gestation )
- HbA1C level in early pregnancy  $< 42\text{mmol/mol}$   
    ➔ correlates with risk of fetal loss
- HbA1c  $> 85\text{ mmol/mol}$  has fetal loss risk of 30%





- Assess for **diabetes vascular complications** - **multidisciplinary team** ( **retinopathy, nephropathy & neuropathy** ) prior to pregnancy
- To use contraception until glucose control is good
- Plan peri-conception adjustments to other medications such as statins and ACE inhibitors



# Fetal Complications

## CONGENITAL MALFORMATIONS -

- 2 - 4 times more common
- Three fold excess of cardiac, NTD, sacral agenesis
- Most crucial period – period of organogenesis – first 42 days of pregnancy

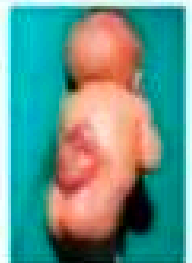
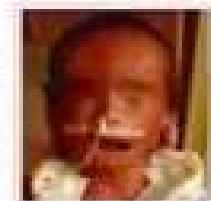
### Caudal regression syndrome



- severe form called sirenomelia (Mermaid syndrome).
- is a lethal abnormality.

### CNS anomalies

- Neural tube defects
  - Anencephaly
  - Meningocele
- Hydrocephaly
- Holoprosencephaly



## MACROSOMIA -

Accelerated growth pattern in late 2<sup>nd</sup> and 3<sup>rd</sup> trimester

- Birth trauma
- Shoulder dystocia
- Hypoxia
- Increased cesarean section rate

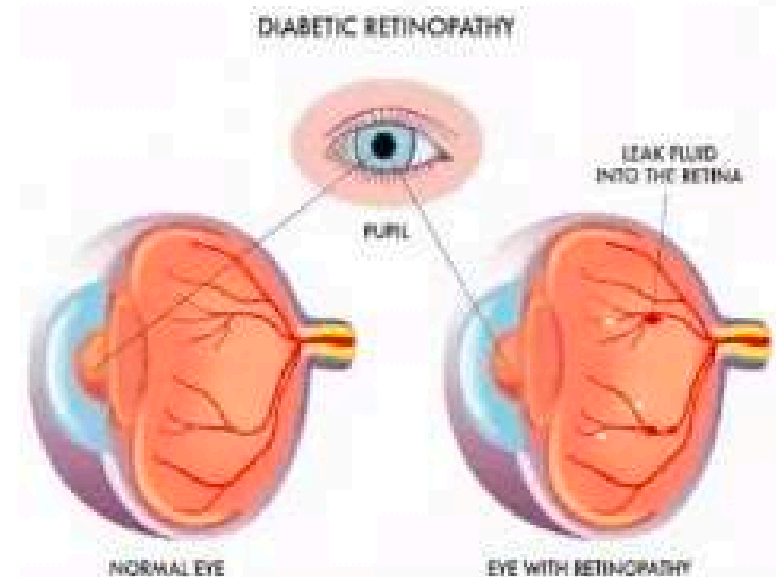
## SUDDEN, UNEXPLAINED FETAL DEMISE -

Especially in the 3<sup>rd</sup> trimester, **five times higher** than general population

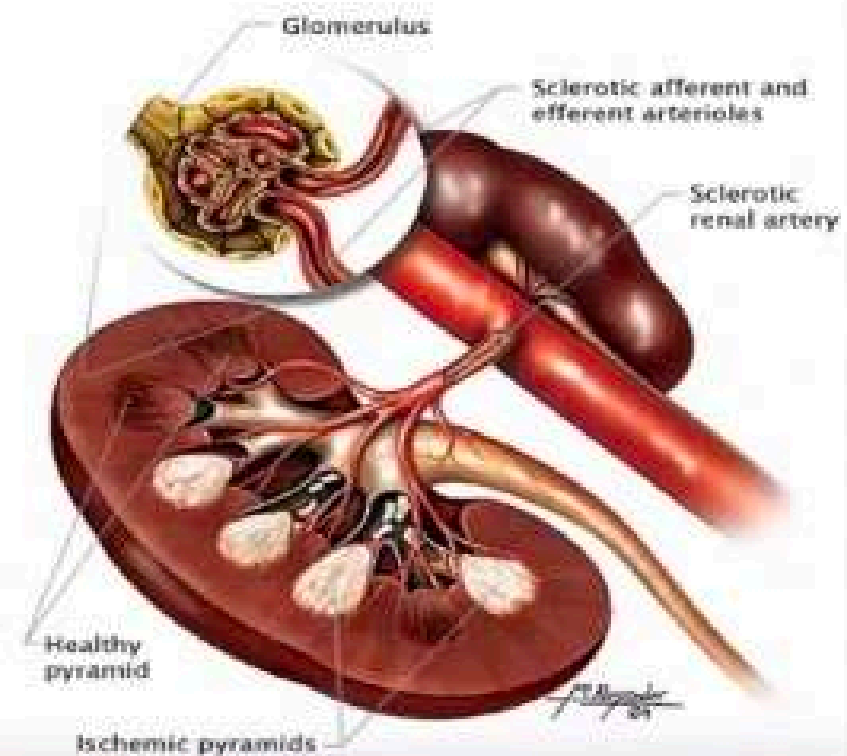


# Maternal Complications

1. **Increase maternal morbidity** related to severity of diabetic related vascular disease
2. **Coronary artery disease**
3. **Retinopathy**
4. **Nephropathy**
5. **Pre-eclampsia** - risk increased **three times**



6. Women with **diabetic retinopathy** at risk of progression of disease
7. Increased incidence of **infections**
8. **Hyper & hypoglycemic attacks**
9. **Diabetic ketoacidosis**
10. Increased **C-Section** rate



# Management In Pregnancy

## PLAN OF CARE –

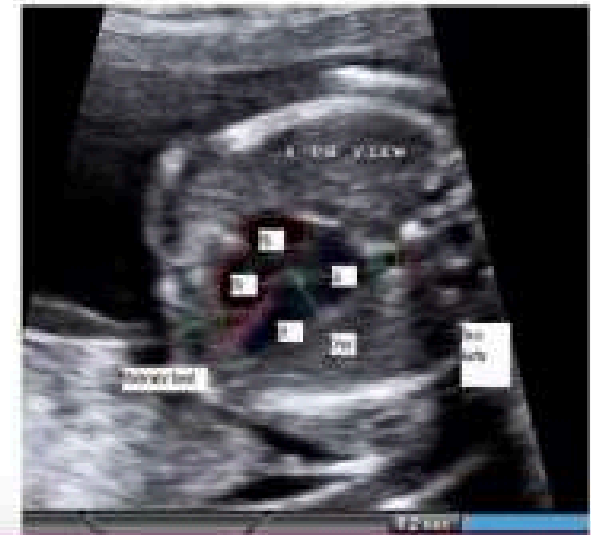
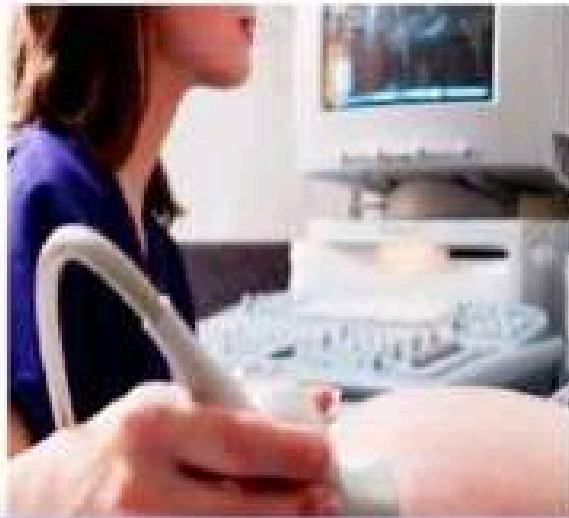
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- Target glycemic control
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- Education regarding diet, oral hypoglycemics & insulin
- Fetal surveillance
- Plan for delivery

# Investigations

- CBC - Hb. Platelet count
- BLOOD GP & rhesus status
- RFT- serum creatinine
- LFT
- SERUM URIC ACID
- BSL – 7 Times
- HbA1c

## Contd.

- FUNDOSCOPY
- ANOMALY SCAN --18 -20 weeks
- FETAL ECHO – 22 weeks
- GROWTH SCAN – FORTNIGHTLY
- DOPPLER SCAN





# Diet

- Whole fruits and vegetables
- Moderate amounts of lean proteins and healthy fats
- Moderate amounts of whole grains, such as bread, cereal, pasta, and rice
- Starchy vegetables eg. corn and peas
- Avoid foods with sugar, soft drinks, fruit juices, and pastries



# Target Blood Glucose Levels

- HbA1c: <6 %
- Target glycaemic control -7 times a day [before and one hour after meals]
- Pre-meal: < 5.3 mmol/L (<95 mg/dl)
- 1 Hr. postprandial: < 7.8 mmol/l (< 140 mg/dl)
- Management of hypoglycaemia – Very dangerous – awareness of symptoms
- Dose of metformin & Insulin adjusted: Insulin resistance increases as pregnancy advances



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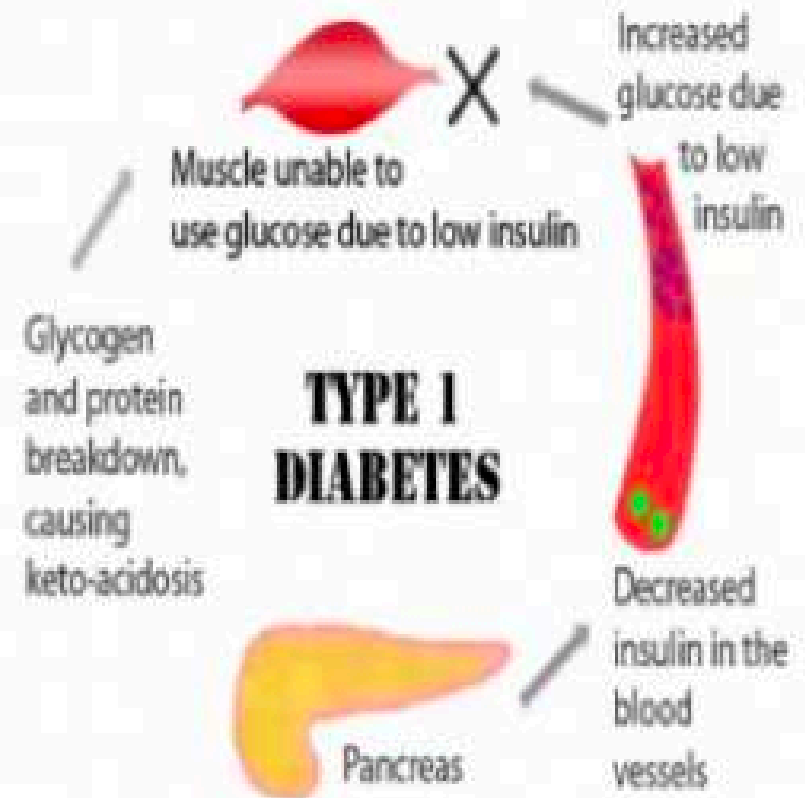
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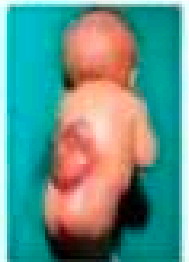
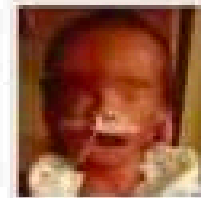
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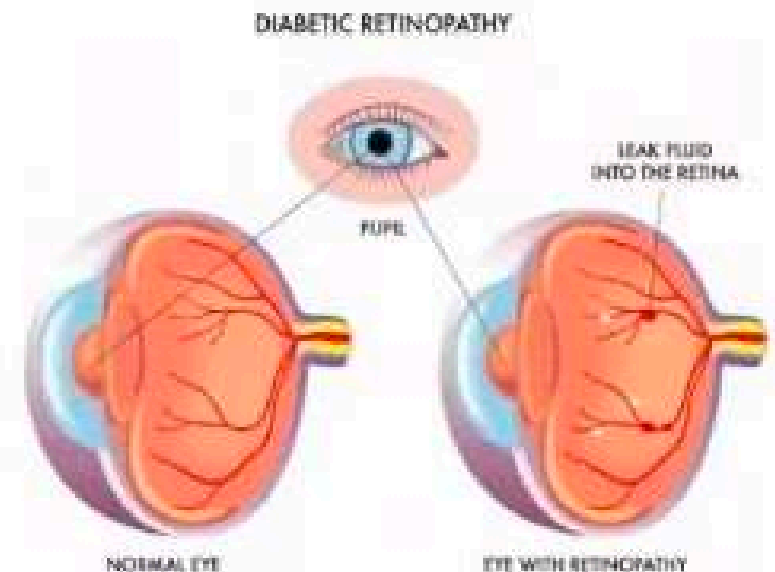
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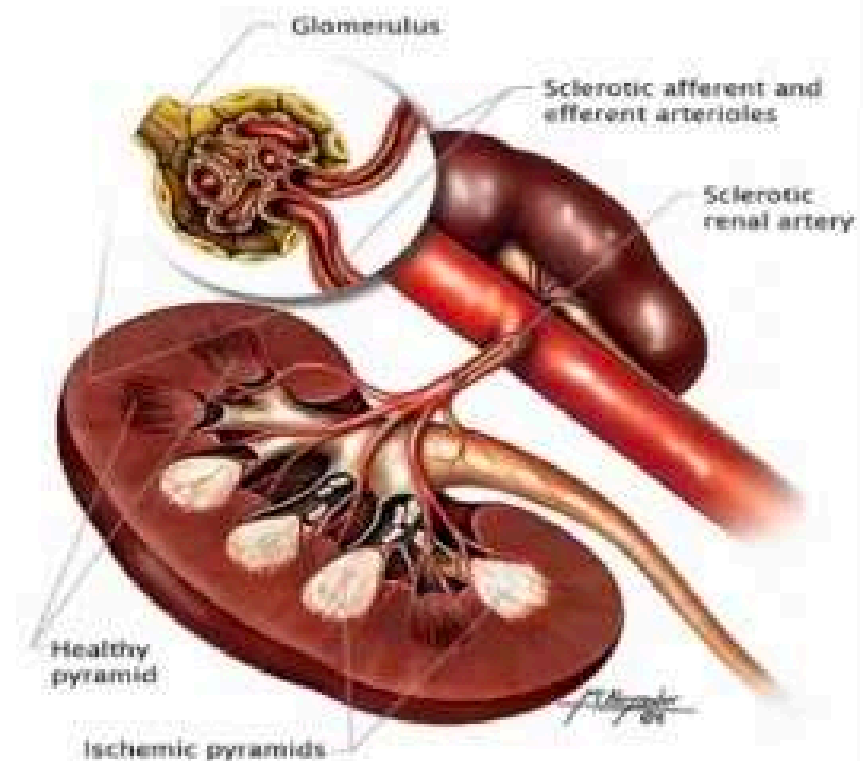


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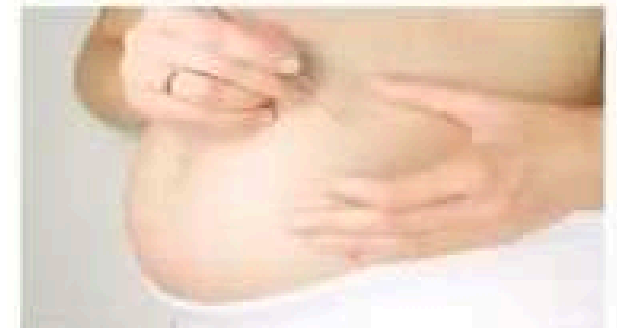
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# Fetal Surveillance

## ANOMALY SCREENING ..

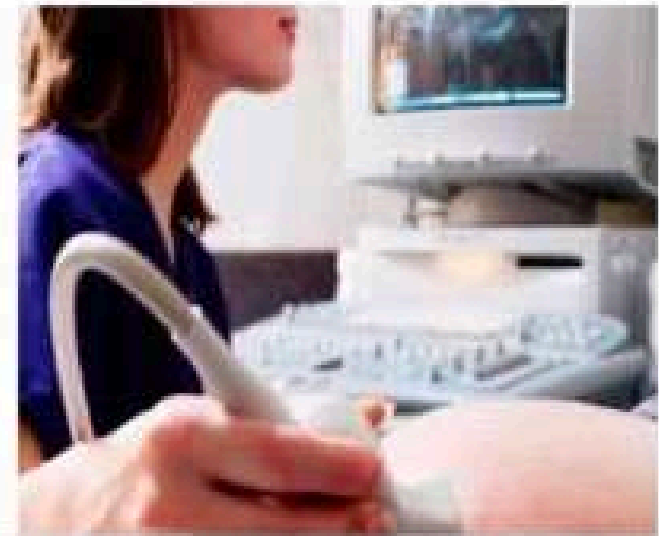
- Nuchal translucency: B/W 11+3 and 13+6 weeks
- Anomaly scan : 19-20 wks
- Fetal echo-cardiography : 22weeks

## SERIAL GROWTH SCANS ...fortnightly

- Fetal growth
- Macrosomia
- Polyhydramnios

## FETAL WELL-BEING

- Doppler scan
- CTG



# Delivery

## STEROID COVER IF BEFORE 34 WEEKS

In patient admission & injection **dexamethasone 6 mg, 12 hours apart, 4 doses**, additional **insulin therapy** to maintain normoglycemia

## TIME OF DELIVERY

➤ At **38 - 39 weeks**

## MODE OF DELIVERY

- **Aim:** Is vaginal delivery-
- Cesarean section - If complications have developed,
  - macrosomia or
  - maternal complications eg. Pre- eclampsia & failed induction



# Monitoring in labour

- Hourly blood glucose check-up
- Target blood glucose 4 -7 mmol/L (72mg/dl -126mg/dl ) to reduce risk of neonatal hypoglycemia
- Control - By sliding scale of insulin and glucose
- **AFTER DELIVERY** - Insulin dose is halved as insulin requirement decreases to pre-pregnancy levels
- **POST NATAL:** Women have increased risk of hypoglycemia if breast feeding



# GESTATIONAL DIABETES

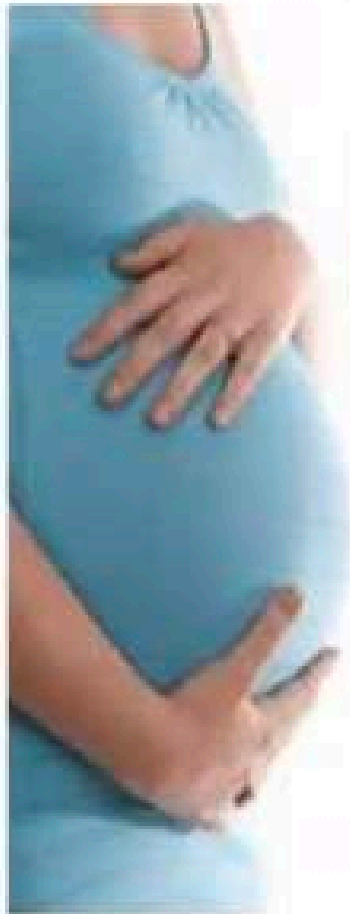
- **INCIDENCE-** 10-15% of pregnancies.
- Occurs for the first time in pregnancy
- **SCREENING - For high risk patients:**
  - Women with ethnic origin
  - Family history of type 2 diabetes
  - Maternal obesity<sub>I</sub>
  - Previous large for gestational age baby
  - Previous still born baby

- Urinary glucose- Unreliable
- BSR - Low detection rate
- OGTT- Recommended
- GCT -

### **OGTT - WHO guidelines for diagnosis of GDM**

- A fasting glucose - 5.1mmol/l [91mg/dl]
- 1 hour post 75 g glucose load- 10.0 mmol/l [180mg/dl]
- 2 hour post glucose load - 8.5 mmol/l [153mg/dl]

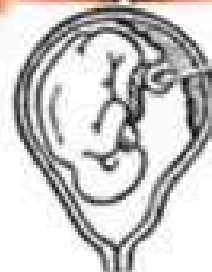
## Gestational Diabetes



High blood glucose levels in mother

Brings extra glucose to baby

Causes baby to put on extra weight



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

# Management

**Principles:** Same as for women with pre existing diabetes

➤ DIET CONTROL & LIFE STYLE CHANGES

➤ TARGET BLOOD GLUCOSE

- Fasting 3.5 - 5.5 mmol/L (< 90 mg/dl)

- Postprandial < 7.1mmol/L (< 140 mg/dl)

➤ IF POOR CONTROL ON DIET

Start -- **Oral hypoglycemic - Metformin**

-- **Insulin therapy**

➤ TO STOP INSULIN AFTER DELIVERY



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# Postpartum

- Most important- Exclusion of type 2 diabetes after pregnancy
- Screening with - Fasting blood glucose or HbA1c offered 6 - 13 weeks after childbirth



# Factors associated with poor pregnancy outcome in diabetes

- Maternal social deprivation
- No folic acid intake pre-pregnancy
- Suboptimal approach of woman
- Suboptimal preconception care
- Suboptimal glycaemic control at any stage
- Suboptimal maternity care during pregnancy
- Suboptimal fetal surveillance of big babies



# Effects Of Pregnancy On Diabetes

- Increase nausea and vomiting in early pregnancy
- Greater importance of tight glucose control
- Increase in insulin dose requirements in the second half of pregnancy
- Increased risk of severe hypoglycemia
- Risk of deterioration of pre-existing retinopathy
- Risk of deterioration of established nephropathy

# Effects Of Diabetes On Pregnancy

- Increased risk of miscarriage
- Risk of congenital malformation
- Risk of macrosomia
- Increased risk of preeclampsia
- Increased risk of stillbirth
- Increased risk of infection
- Increased operative delivery rate