



INFANT OF DIABETIC MOTHER

DR.NAJIA AL JAROUSHI

Infant of diabetic mother

IDM---An infant born to a mother who has diabetes either.

- ❑ Type 1 IDDM (juvenile diabetes) early onset
- ❑ Type2 NIDDM (adult diabetes)maturity onset
- ❑ Gestational diabetes

Diabetic mother at risk of

- Polyhydramins
- Preeclampsia
- Chronic hypertension
- pyelonephritis
- Preterm labor
- High mortality rate in all ages more after 32 due to ketoacidosis or cong. anomalies



Pathophysiology

Maternal hyperglycemia → fetal hyperglycemia → fetal hyperinsulinemia

Hyperinsulinemia increase hepatic up take of glucose glycogen synthesis, accelerated lipogenesis, and augmented protein synthesis

Cont.

- ▶ ↑wt. of placenta
- ▶ ↑fetal organs except brain, kidney
- ▶ myocardial hypertrophy
- ↑↑insulin ++ hyperglycemia
 - ▶▶ acidosis ▶▶ ↑↑risk of fetal death

Presentation

- ▶ Large & plump baby with puffy plethoric faces
- ▶ Hypotonic, hypothermia
- ▶ Poor feeding, lethargy
- ▶ Jaundice
- ▶ Tremors
- ▶ Respiratory distress
- ▶ Hypertrichosis, hairy pinna
- ▶ Hepatomegaly, cardiomegaly



Complications of IDM

- ▶ Fetal death
- ▶ Premature delivery
- ▶ Macrosomia
- ▶ Congenital anomaly
- ▶ Birth asphyxia ▶▶ perinatal or natal asphyxia
- ▶ Birth trauma

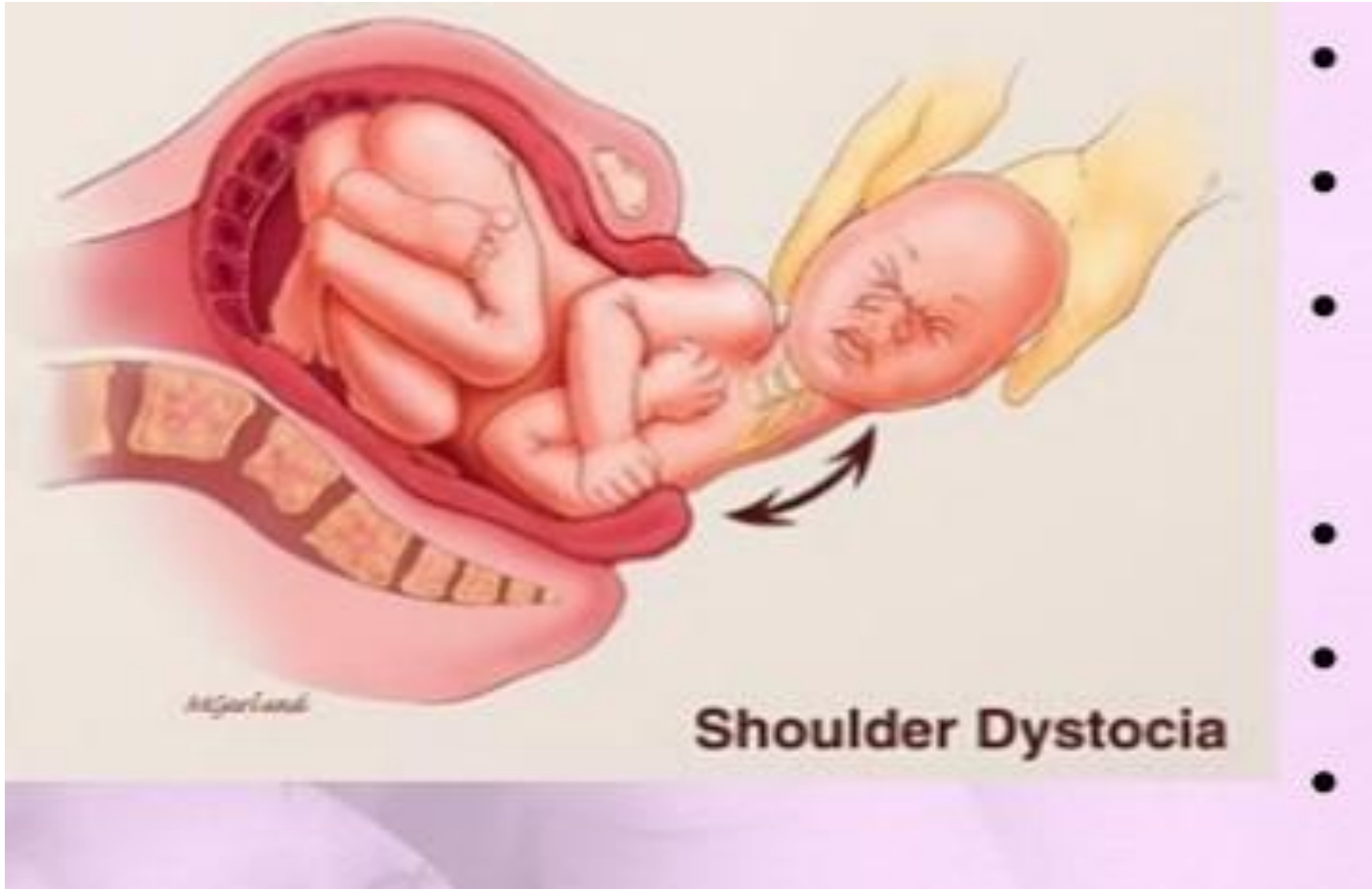


Macrosomia

- ❖ wt >90% , >4kg
- ❖ ↑risk of
- ❖ birth trauma (brachial plexus injury , cephalohematoma , abdominal trauma)
- ❖ ↑c\s
- ❖ birth asphyxia

birth trauma





IUGR

- ❖ due to poor control diabetes [class F] mother with ,renal ,retinal .cardiovascular disease,
- ❖ Wt < 2.5 kg less than 10%

IUGR

&

macrosomia



Hypoglycemia

- ▶ Maternal hyperglycemia
→→fetal hyperinsulinemia
- ▶ After birth sudden stop of glucose supply to the baby through placenta lead to hypoglycemia

Hypoglycemia

- ▶ Hypoglycemia ▶ means blood sugar <40mg%
- ▶ Seen in 25-50% of IDM
- ▶ Small % symptomatic
- ▶ Blood sugar low at 30-60 min after birth
- ▶ Treatment ▶ early feeding
- ▶ ▶ I.V bolus D 10%
- ▶ ▶ continues infusion D10%
- ▶ ▶ improved within 24 to 48hr

hypocalcaemia

- ❑ Serum ca <7mg%
- ❑ Appear in 24-72hr [resolve spontaneous
- ❑ s/s jitteriness, apnea,tachypnea,seizure
- ❑ Could be due to [low PTH
,hyperphosphatemia, birth asphyxia, low
magnesium
- ❑ Treatment I.V ca slowly
- ❑ 2cc/kg of 10% ca gluconate

Hypomagnesmia

- ▶ Serum Mg <1.5mg
- ▶ Transient [due to maternal renal loss]
- ▶ Treat with Mg sulfate IM

Dose 0.25 ml/kg of 50% solution daily
For 3 days

[If hypocalcaemia persist]



Polycythemia

- ▶ Hct >65
- ▶ Hypoxia ▶ ↑erythropoietin ▶ ↑RBC production
 - ▶ ↑risk of
 - renal vein thrombosis
 - necrotizing enterocolitis
 - Stroke
 - If Hct >70 ttt partial exchange transfusion by normal saline or plasma

Hyperbilirubinemia

▶ What's the causes ?



Hyperbilirubinemia

- ▶ Premature delivery
- ▶ Polycythemia
- ▶ Birth asphyxia
- ▶ Birth trauma
- ✓ cephalhematoma
- ✓ bruising
- ✓ abd. trauma

Causes of respiratory distress

- ▶ R.D.S
- ▶ H.C.M
- ▶ T.T.N.B
- ▶ Polycythemia
- ▶ Pneumonia
- ▶ Pneumothorax
- ▶ Diaphragmatic hernia

Respiratory

- ❖ Respiratory distress syndrome HMD
 - Due to
 - ❑ Premature delivery
 - ❑ Antagonistic effect of insulin on stimulation of surfactant synthesis by cortisol
 - ❑ More common in diabetic mother 3-5 times

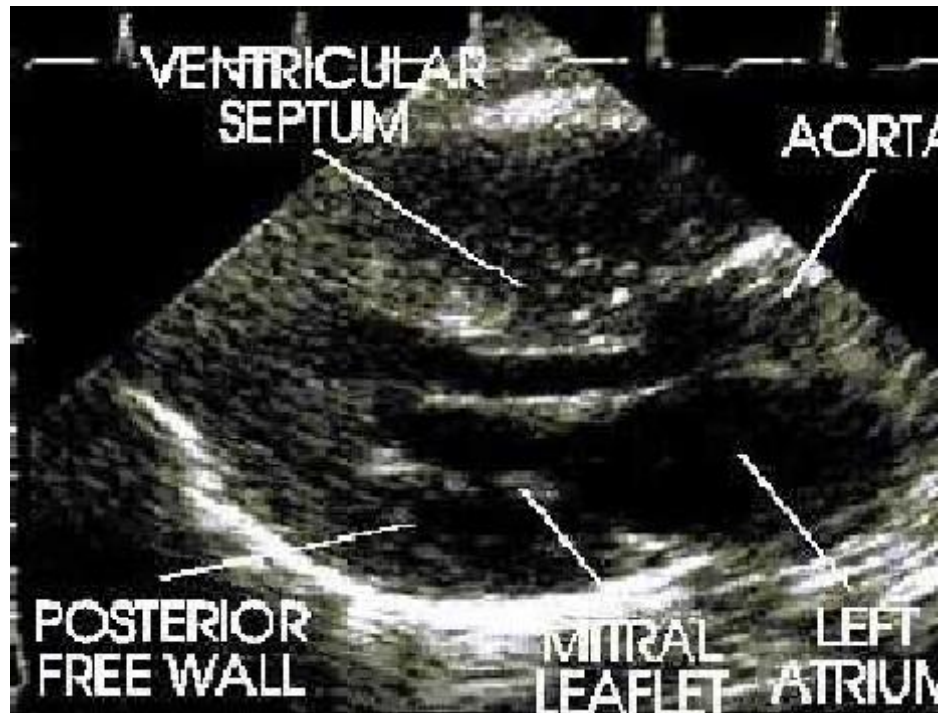
Respiratory.

- ❖ Transient tachypnea of newborn [TTN]
- ▶ Risk factor
- ▶ → polycythemia
- ▶ → birth asphyxia
- ▶ → macrosomia
- ▶ → preterm
- ▶ → c\s
- ▶ Caused by delay resorption of fetal lung fluid [improved within 72hr]

Cardiac

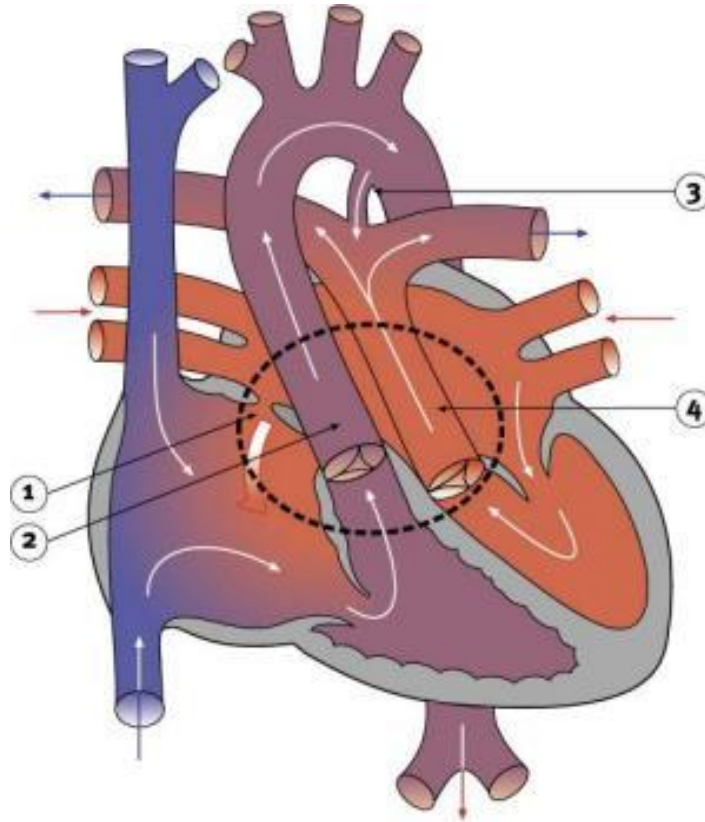
- ▶ Asymmetrical septal hypertrophy
- ▶ [obstructive cardiomyopathy]
- ▶ [↑intraventricular septum thickness]
- ▶ Mainly asymptomatic
- ▶ Few with HF treated with propranolol
- ▶ Digoxin contraindication
- ▶ Resolved by 3-6month

Obstructive cardiomyopathy



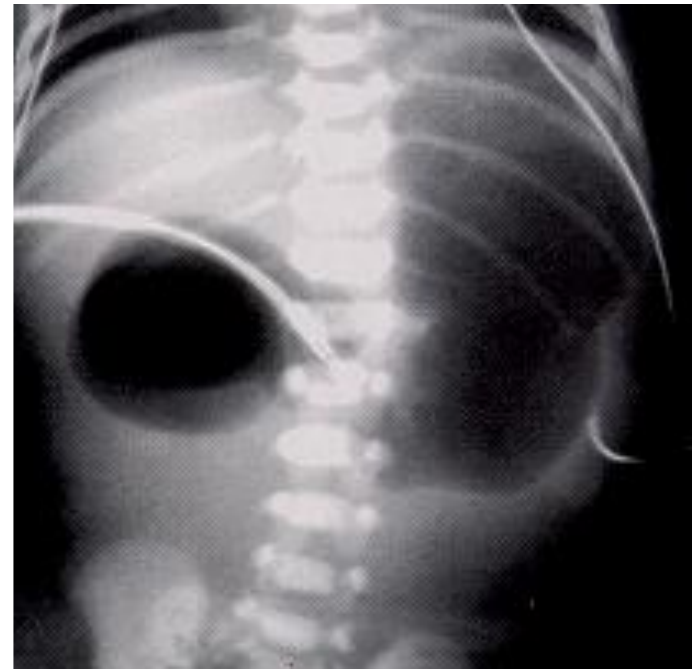
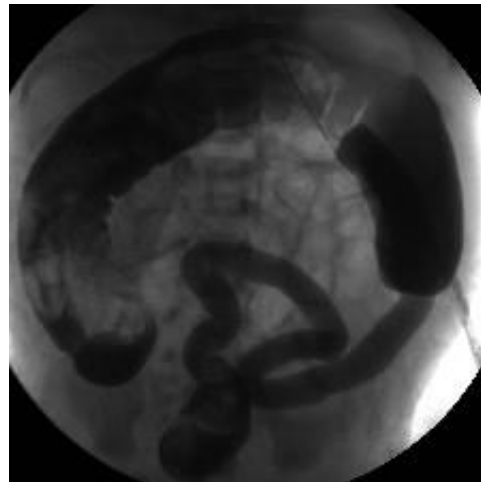
Cong.heart disease

- TGA
- PDA
- VSD
- ASD
- TOF



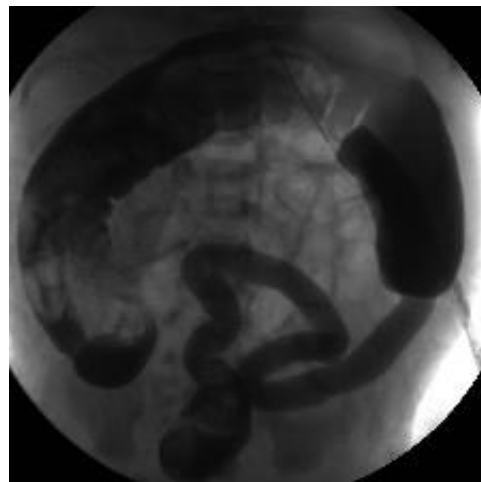
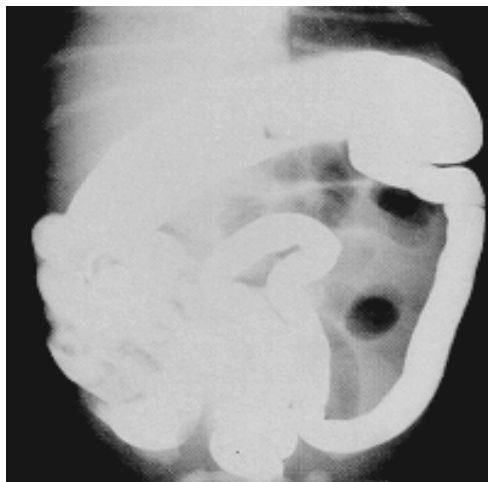
Cong malformation

- ▶ GIT anomaly
- ❖ Anorectal atresia
- ❖ Duodenal atresia
- ❖ Small left colon syndrome



Small left colon syndrome

- ▶ Transient inability to pass meconium
- ▶ Present as lower bowel obstruction
- ▶ Diagnosis is made by barium enema



CNS

- ❑ Neural tube defect
- ❑ Microcephaly
- ❑ Anencephaly
- ❑ Caudal regression



Other anomaly

- ❑ Renal
 - ▶ polycystic kid.
 - ▶ renal agenesis
 - ▶ dysplastic kid.
- ❑ Skeletal
 - ▶ hemi vertebra
 - ▶ sacral agenesis
 - ▶ short femur

investigation

- Blood sugar 30-60min then hrly in 1st 6hrs
- CBC ► HCT , Hb, PLT
- S. Ca,Mg
- Bilirubin
- ABG
- ECHO,
- U\S [abd,brain]

Prognosis

- ❖ Childhood obesity
- ❖ Type II DM
- ❖ Recurrency of hypoglycemia 10-15% later in infancy
- ❖ Neurodevelopment deficit





Hypoglycemia

- ▶ Hypoglycemia ▶ defined as blood sugar $<40\text{mg}\%$
- ▶ it's either due to
 - ▶ \uparrow utilization
 - ▶ \downarrow production or stores
 - ▶ or both



Increase utilization

- ❑ IDM [infant of diabetic mother]
- ❑ LGA [large for gestational age]
- ❑ Erythroblastosis fetalis
- ❑ Islet cell hyperplasia
- ❑ Beckwith –wiedemann syndrome
- ❑ Insulin producing tumor

Beckwith-Wiedemann
Syndrome

Macrosomia, macroglossia,
omphalocele, hypoglycaemia,
microcephaly



Decrease production

- ❑ Preterm baby
- ❑ IUGR
- ❑ Inadequate caloric intake
- ❑ Delay feeding

↑utilization&↓production

- ❑ Perinatal stress [sepsis, shock, asphyxia]
- ❑ Exchange transfusion
- ❑ Glycogen storage disease
- ❑ Adrenal hyperplasia ,hypopituitarism
- ❑ Polycythemia
- ❑ Metabolic disease
- ❑ Maternal therapy with β blocker

S\S

- Jitteriness
- Apnea
- Irritability
- Lethargy
- Seizure
- RD
- Poor feeding
- Hypotonia
- hypothermia



infant at risk

- IDM
- LGA
- Preterm
- IUGR
- SGA
- Polycythemia
- Sick infant
- asphyxia



Management

Oral feeding ►

- If baby asymptomatic
- Milk feeding → blood sugar one hr. after feed → if low start I.V infusion

Management

I.V.F therapy indication ►► IF

- Symptomatic infant
- Not tolerate oral feeding
- No improvement after oral feeding
- Blood sugar <30mg%

Management

- ▶ Bolus 2ml of D10%
- ▶ Follow bolus with continuous dextrose fluid [6-8 mg/kg/min]
- ▶ Check sugar after 30 min
- ▶ If normal start oral =cont. IV fluid and start tapering conc. Of sugar in drip [keep blood sugar <50%]

Medical therapy

1. Hydrocortisone 10 mg/kg stat
then 5mg/kg/day
2. Glucagon 0.025mg/kg I.M / I.V
(used in good size baby)
3. Diazoxide 2.5 mg/kg/dose

Thank you ...

