



High-Risk Related To Maternal Conditions

Hypoglycemia

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Hypoglycemia

Hypoglycemia may appear a short time after birth and in **Infants Of Diabetic Mothers** (IDMs) is associated with increased insulin activity in the blood.

Some researchers recommend that serum glucose levels be maintained above 45 mg/dl (2.5 mmol/L) in infants with abnormal clinical symptoms and as high as 50 or 60 mg/dl in other infants .

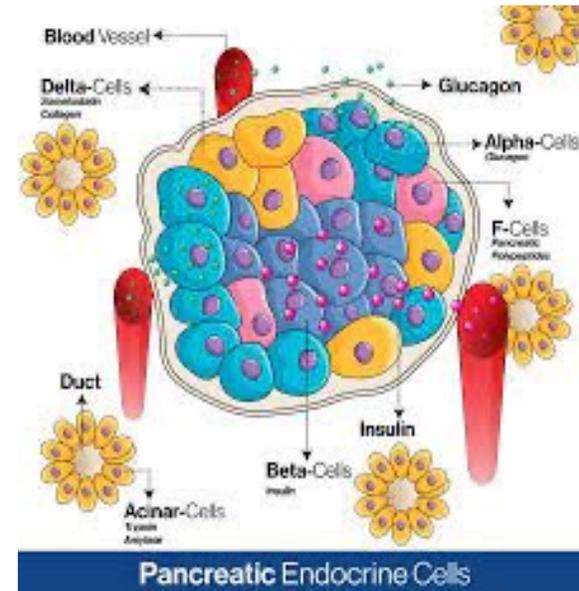
The AAP recommends that symptomatic infants receive treatment if their blood glucose is less than 40 mg/dl.

- **Pathophysiology**

- Hypoglycemia in IDMs is related to **hypertrophy and hyperplasia** of the **pancreatic islet cells** and thus is a transient state of **hyperinsulinism**.

- High maternal blood glucose levels during fetal life provide a continual stimulus to the fetal islet cells for insulin production (glucose easily passes the placental barrier from maternal to fetal side; insulin, however, does not cross the placental barrier).

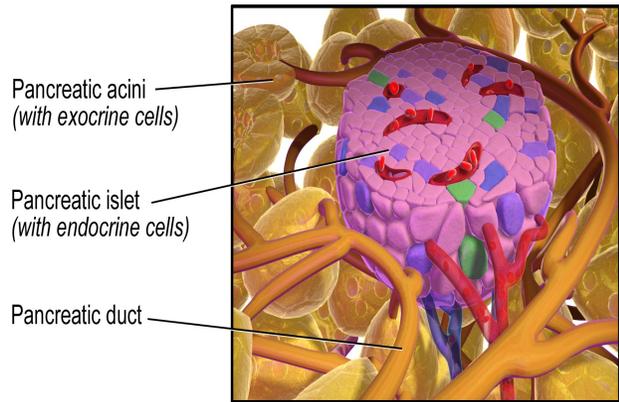
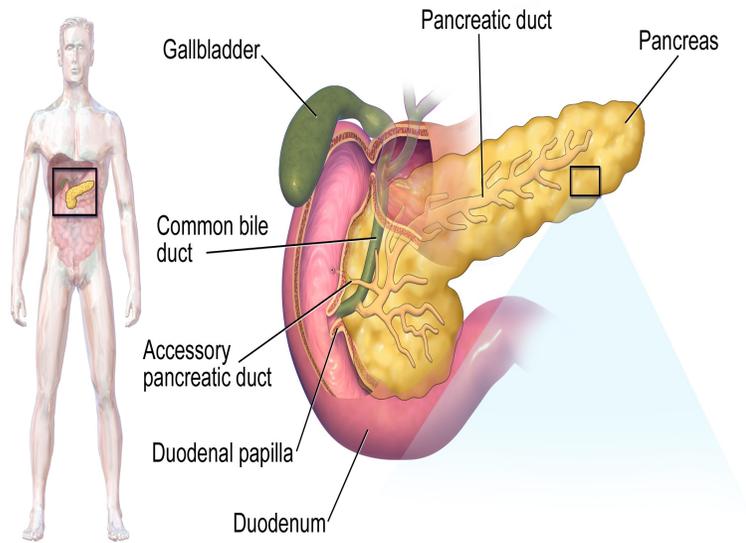
- This sustained state of hyperglycemia promotes fetal insulin secretion that ultimately leads to excessive growth and deposition of fat, which probably accounts for the infants who are large for gestational age, or macrosomic .



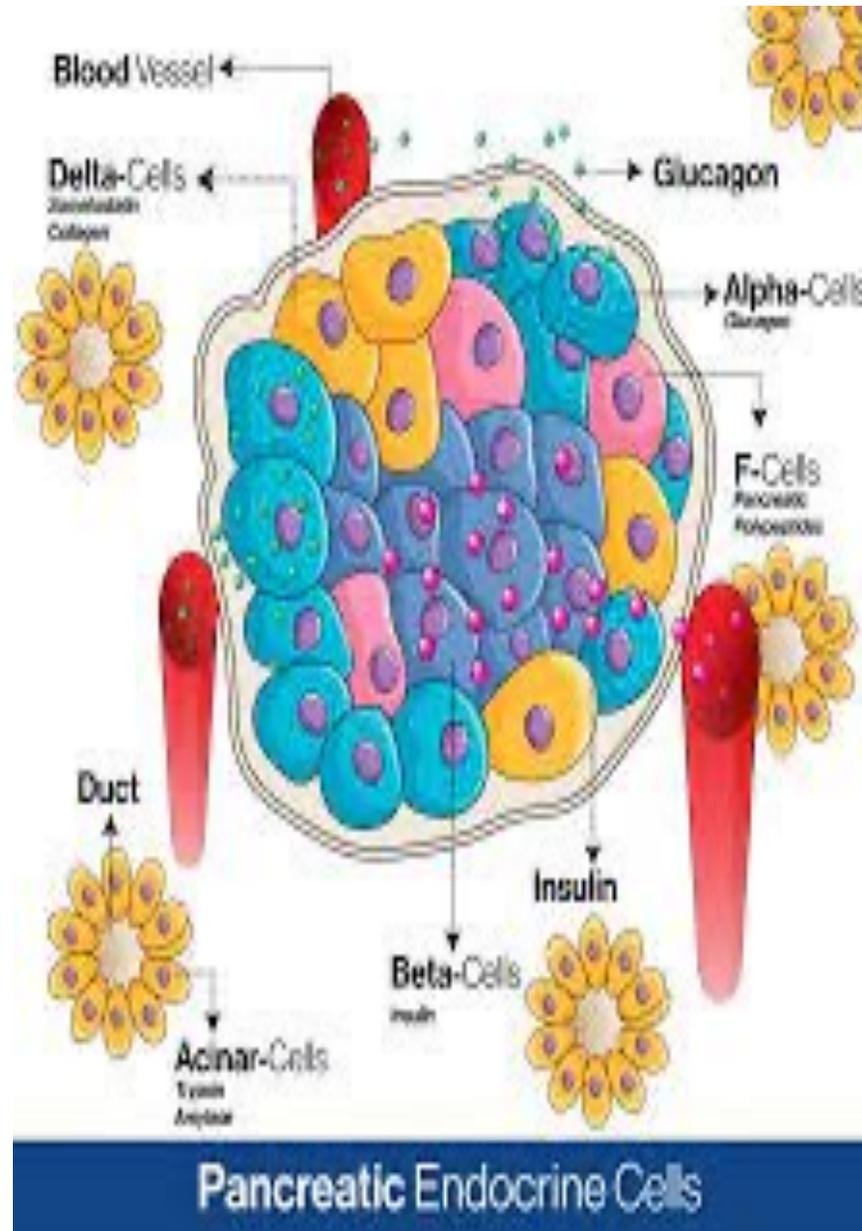


cont: **Pathophysiology**

- IDMs are more likely to have disproportionately large abdominal circumferences and shoulders, leading to an increased risk of **shoulder dystocia** and **birth injury**.
- When the neonate's glucose supply is **removed abruptly** at the time of birth, the continued **production of insulin soon depletes** the **blood of circulating glucose**, creating a state of **hyperinsulinism** and **hypoglycemia** within 0.5 to 4 hours, especially in infants of mothers with poorly controlled diabetes .
- Precipitous drops in blood glucose levels can cause serious neurologic damage or death.



Pancreatic Tissue



Clinical manifestation of IDMs

- Large for gestational age
- Very plump and full faced
- Abundant vernix caseosa(A)
- Listless and lethargic
- Possibly meconium stained at birth

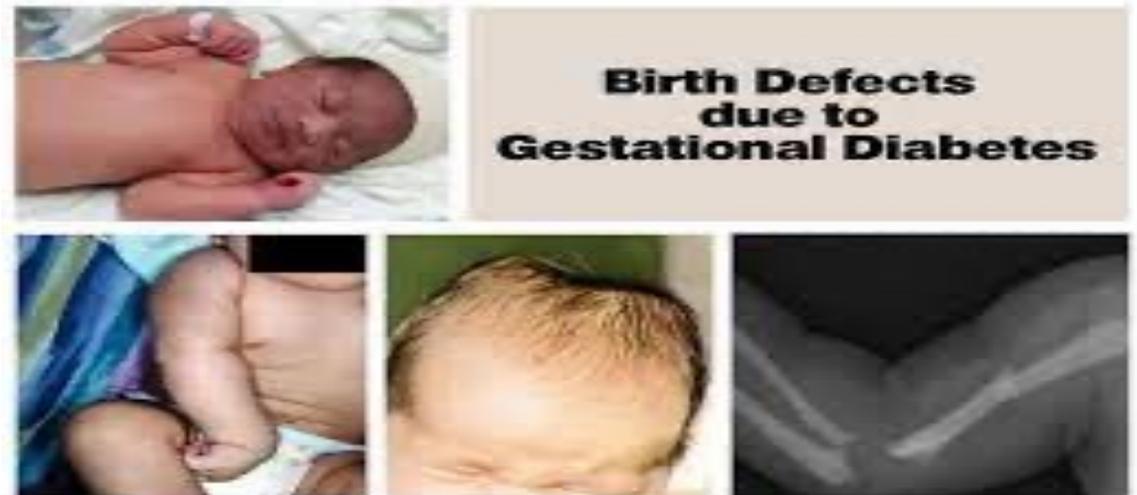


(A)



Characteristic Appearance

- Infants of mothers with advanced diabetes may be:
- Small for gestational age, may have IUGR,
- There is an increase in congenital anomalies in IDMs in addition to a high susceptibility to hypoglycemia, hypocalcemia, hypomagnesemia, polycythemia, hyperbilirubinemia, cardiomyopathy,
- and RDS Hyperinsulinemia and hyperglycemia in the diabetic mother may be factors in reducing fetal surfactant synthesis, thus contributing to the development of RDS.
- Although large, these infants may be delivered before term as a result of maternal complications or increased fetal size.



Congenital hyperinulinism

- a condition which causes neonatal macrosomia and profound hypoglycemia, is often present in the neonatal period. However, this condition is usually not associated with maternal diabetes mellitus, but appears to have a genetic etiology.





• **Therapeutic Management**

- The most important management of IDMs is:
- Careful monitoring of serum glucose levels .
- Observation for accompanying complications such as Respiratory Distress Syndrum (RDS).
- The infants are examined for the presence of any anomalies or birth injuries.
- blood investgation for determination of glucose, calcium, hematocrit, and bilirubin are obtained on a regular basis.
- feedings of breast milk or formula begin within the first hour after birth, provided that the infant's cardiorespiratory condition is stable.
- Approximately half of these infants do well and adjust without complications.



Cont: Therapeutic Management

- Infants born to mothers with poorly controlled diabetes may require IV dextrose infusions.
- Treatment with 10% dextrose and water (IV) is initiated with the goal of maintaining serum blood glucose levels between 40 and 50 mg/dl .
- Oral and IV intake may be titrated to maintain adequate blood glucose levels.
- Frequent blood glucose tests are needed for the first 2 to 4 days of life to assess the degree of hypoglycemia present at any given time.
- Testing blood taken from the heel with calibrated portable reflectance meters (e.g., glucometers) is a simple and effective screening evaluation that can then be confirmed by laboratory examination.



Nursing Care Management

- The nursing care of IDMs involves:
- Early examination for congenital anomalies, signs of possible respiratory or cardiac problems
- maintenance of adequate thermoregulation, early introduction of feedings
- monitoring of serum blood glucose levels. This is of particular importance because many infants with hypoglycemia may remain asymptomatic.
- IV glucose infusion requires careful monitoring of the site and the neonate's reaction to therapy; high glucose concentrations ($\geq 12.5\%$) .

Nursing Care Management



- Because macrosomic infants are at risk for problems associated with a difficult delivery, they are monitored for birth injuries such as brachial plexus injury and palsy, fractured clavicle, and phrenic nerve palsy.
- Additional monitoring of the infant for problems associated with this condition (polycythemia, hypocalcemia, poor feeding, and hyper-bilirubinemia) is also a vital nursing function.
- Some evidence indicates that IDMs have an increased risk of acquiring type 2 diabetes and metabolic syndrome in childhood or early adulthood . therefore, nursing care should also focus on lifestyle and prevention later in life with IDMs.



Thanks