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Infant Of Diabetic Mother(IDM)

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Abstract:

Maternal diabetes during pregnancy is one of the major burning problem around the world. High blood sugar level in a pregnant women can affect the infant after birth. Mothers with poorly controlled diabetes are also more likely to have miscarriage or stillbirth. Infants born to diabetic mothers have been at greater risk for malformations, perinatal morbidity and mortality.The delivery may be difficult if the baby is large and increases chances of trauma during birth. Infants of diabetic mothers are twenty times more at risk to develop cardiovascular defects. So extra efforts and attention should be needed for delivery room and nursery management of infants of diabetic mothers.

Keywords: Diabetic mother, hypoglycaemia, hyperglycaemia, glycemic control.

Definition- An infant of diabetic mother is a baby born to a mother with diabetes. A baby's mother had high blood sugar levels(glucose) throughout the pregnancy.

Introduction[1]-

Diabetes is the most common endocrine disorder affecting woman during pregnancy. In this disease the mother and her baby both have a number of complications. The infant of diabetic mother (IDM) is the example of the morbidity that may exist in the neonate due to maternal disease (diabetes). The fetus is completely dependent on mother for glucose delivery. Maintenance of glucose homeostasis may be a major problem even for the normal neonates. The no. of complications can be controlled by periodic screenings, well balanced diet and proper medication of mother.

Prevalence-

The World Health Organization(WHO) has predicted that between 1995 and 2025, there will be 35% increase in the worldwide prevalence of diabetes. Moreover, women

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born in Asian countries display the highest prevalence of Gestational Diabetes Mellitus(GDM), with upto 17% of women likely to develop GDM, in comparison to 4% of European and White American woman. The prevalence of gestational diabetes in southern India was recently found to be 17.8%, 13.8% in semi urban and 9.9% in rural women.

Symtoms-

1.The infant is usually large for gestational age.

2.Blue or patchy (mottled) skin colour

3.Tachycardia, tachypnea(signs of immature lungs or heart failure)

4.Neonatal jaundice

5.Poor feeding, lethargy, weak cry

6.Puffy face

7.Reddish appearance

8.Tremors

Infants of diabetic mother having no. of clinical problems as follows[3]-

1.Congenital anomolies-

Around 6-9% IDM's having congenital anomolies which account for 50% mortality.

a)Cardiovascular- e.g. VSD, transposition of greater vessels.

b)Skeletal- Caudal regression syndrome

c)CNS- Meningomyelocele, anencephaly, holoprosencephaly

d)other- Renal,gastrointestinal

2.Unexplianed fetal demise- Associated with poor control

3.Macrosomia(birth weight equal or greater than 4 kg)-

It increases risk of traumatic delivery. It can be reduced by good glycemic control during 20-30 weeks of gestation.

4.Intrauterine growth retardation-

5.hypoglycemia

6.Hyperglycemia

7.Hyperbillirubinemia

8.hypocalcemia- can occurs in 17% IDM's. Often with hypomagnesemia

9.hypomagnecemia

10.Respiratary distress syndrome

11.Septal hypertrophy of heart-

Occurs in infants of gestational and insulin dependent diabetes. Left ventricular compliance and cardiac output decreases. Hypertrophy gradually resolves by age 6-12 months.

12.Small left colon (Hypoplastic left colon syndrome)-

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Present at lower bowel obstruction. Cause is thought to be delayed innervation of distal bowel.

13.Polycythemia- Associated with poor glycemic control or maternal vascular disease.

14.Fetal and neonatal hypoxia-

Poor controlled diabetes may lead to decreased supply of oxygen to the fetus and increased oxygen consumption by the feto-placental unit.

15.Poor feeding- Is common, an IDM may take several days to establish nipple feedings.

Glycemic control in pregnancy and fetal-neonatal complications[4]-

Fetal –neonatal complications are directly related to glycemic control during key periods of pregnancy.

1.Poor periconceptional and early first trimester glycemic control are related to spontaneous and early growth delay, major congenital malformation.

2.During second trimester; it is predictive of pregnancy induced hypertension(PIH), preterm labour, minor congenital anamolies

3.During third trimester; predictive of macrosomia, birth trauma, fetal dystocia, high caesarean section rate, maternal trauma.

Pathophysiology[1] -

1.With insulin dependent diabetes mellitus maternal hyperglycemia, hypoglycemia, and ketosis can occur during fetal organogenesis and there is increased incidence of fetal anamolies.

2.maternal hyperglycemia leads to fetal hyperglycemia; this stimulates fetal pancreatic beta cells and increased production of insulin by the fetus.

3.Excess maternal glucose and amino acids provides the substrate for increased synthesis of proteins, lipids and glycogen in the fetus. Most part of the large fetal size is due to the accumulation of fat.

4.Intrauterine growth retardation observed in some infants of diabetic mothers may be due to maternal placental vascular insufficiency.

5.Hypoglycemia observed in some cases due to diminished production of glucose and increased removal by insulin.

6.Hypocalcemia occur may be due to diminished production of parathormone.

7.Hypomagnesemia observed in some cases due to increased losses of magnesium in the urine of diabetic mother.

8.Hyperbillirubinemia may be due to the breakdown of haemoglobin from collection of blood in cephalohematoma which is usually seen in the delivery of large babies.

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9.Insulin blocks induction of enzyme system leads to lower production of surfactant and causes respiratory distress syndrome and higher risk of preterm deliveries.

10.Increased smooth muscles in pulmonary arteries may explains persistant pulmonary hypertension.

Management of IDM's[2]-

Delivery room Management-

In view of risk of dystocia and that of neonatal depressions due to fetal academia , a team of professionals highly trained in the pediatric management of complicated deliveries should be present in the delivery room of planned IDM delivery.

Nursery Management-

1.Vital sign examination and monitoring (e.g.Sugar level)

2.Complete Physical Examination-

In search for the complications mentioned, particular trauma and malformation.

3.Screening of IDM for hypoglycemia, hypocalcemia, polycythemia, and treat appropriately.

Transfer, Consultations and Follow up-

Infants of diabetic mothers having congenital anamolies, heart diseases or significant respiratory illness may require transfer to tertiary care neonatal intensive care unit (NICU) for continued care. Because of the frequency with which cardiac problems occurs in IDM's, early consultation with pediatric cardiologists often is necessary. Other consultations depends on which other congenital malformations or complications are presents.

Prognosis-

Better control of diabetes and early recognition of gestational diabetes has decreased the number and severity of problems in infants born to diabetic mothers. Usually the symptoms reduces in few weeks. However enlarged heart take several months to get better.

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