Fetal Macrosomia

Fetal macrosomia refers to excessive intrauterine growth beyond a certain threshold, usually defined as a birth weight greater than 4500 grams (9 lbs 15 oz), or greater than the 90th percentile for age. The major causes of fetal macrosomia are maternal obesity and gestational diabetes. During pregnancy, estimated fetal weight can be calculated using the Hadlock's formula, measured on ultrasound. Since prenatal diagnosis may be imprecise, the infant must be weighed at birth. Complications of fetal macrosomia include shoulder dystocia, maternal birth canal trauma, and neonatal hypoglycemia. Treatment of fetal macrosomia may involve planned C-section to prevent complications from vaginal delivery.



PLAY PICMONIC

Pathophysiology

Increased Birth Weight

Up-arrow Newborn on Scale

Fetal macrosomia refers to excessive intrauterine growth beyond a certain threshold, usually defined as birth weight greater than 4500 grams. Using a statistical approach, any fetus weighing greater than 90th percentile for gestational age would be considered large for gestational age (LGA).

> 4500 g

Greater-than (4) Fork and (5) Hand

Fetal macrosomia refers to excessive intrauterine growth beyond a certain threshold, usually defined as birth weight greater than 4500 grams. Term infants who are appropriate for gestational age weigh 2500-4000 grams.

Causes

Maternal Obesity

Obese Mother

The risk of fetal macrosomia increases in a linear fashion, as the prepregnancy maternal weight increases.Therefore, the highest risk of macrosomia occurs in obese mothers. Additionally, excessive maternal weight gain during pregnancy is associated with macrosomia.

Gestational Diabetes

Pregnant-woman and Dyed-bead Pancreas

Fetal macrosomia is a common sequela of gestational diabetes mellitus, especially when it is poorly controlled. Birth weight is usually elevated in infants born to mothers with poorly controlled diabetes, due to increased anabolism and glucose uptake by fetal cells. Although if the fetus was subject to severe ischemia secondary to maternal diabetic vascular disease, their weight may be normal or low.

Diagnosis

Weigh Newborn at Birth

Newborn on Scale

In order to clinically diagnose fetal macrosomia, the infant must be weighed at birth. This is because prenatal estimation of fetal weight is not precise. The most widely available means of estimating fetal weight include clinical assessment (i.e., Leopold maneuvers, in which physician palpates fetus through maternal abdomen or measurement of fundal height) and ultrasound.

Ultrasound

Ultrasound-machine

Though ultrasound sonography is most predictive of birth weight, it is not highly accurate. It may be difficult to estimate fetal weight via sonography because the fetus is an irregular, three dimensional structure of varying density. Ultrasound measures the abdominal circumference (AC), head circumference (HC) and femur length (FL). These measurements are then used in Hadlock’s formula to calculate estimated fetal weight.

Sign up for FREE at picmonic.com

Hadlock's Formula

Hadlock-padlock

The Hadlock formula is used to estimate fetal weight. Abdominal circumference (AC), head circumferences (HC) and femur length (FL) are measured on ultrasound and used to estimate baby’s weight.

Complications

Birth Canal Trauma

Canal Trauma-spike

Delivery of a macrosomic infant may lead to maternal birth canal trauma, including lacerations to the perineum, vagina and cervix. Although routine episiotomies are no longer recommended, episiotomies are sometimes necessary to enlarge the opening for vaginal delivery.

Neonatal Hypoglycemia

Neon-baby and Hippo-glue-bottle

Since gestational diabetes is a common cause of fetal macrosomia, infants born to these mothers may develop hypoglycemia after delivery. This is because glucose (but not insulin) crosses the placenta, and the excess maternal glucose causes fetal hyperglycemia in the womb. In response, the fetus produces more insulin. At birth, the constant supply of hyperglycemic blood is removed while the hyperinsulinism remains, and hypoglycemia ensues. Therefore, these infants should be fed as quickly as possible after delivery to avoid neonatal hypoglycemia.

Shoulder Dystocia

Shoulder Dish-toast

Shoulder dystocia occurs when baby's head is delivered through the vagina, but baby’s shoulder get stuck behind the mother’s pubic symphysis inside the vaginal canal. The incidence of shoulder dystocia greatly increases as birth weight increases over 4000 grams. Shoulder dystocia is associated with Erb- Duchenne palsy and brachial plexus injuries, due to excessive traction on the fetal head during delivery.

Treatment

Planned Cesarean Section

C-section with Planner

In order to avoid complications such as shoulder dystocia or birth canal trauma, women may be advised to schedule a cesarean section for delivery. A cesarean section is considered if estimated birth weight is greater than 4500 grams (9 lbs 15 oz) in women with diabetes, or if estimated birth weight is greater than 5000 grams (11 lbs) in women without diabetes.

Sign up for FREE at picmonic.com