Intrauterine Growth Restriction (IUGR)

Intrauterine Growth Restriction (IUGR), also called fetal growth restriction (FGR) is defined as estimated fetal weight less than the 10th percentile for gestational age. Risk factors include maternal systemic disease, maternal drug use, placenta previa and multiple gestations. Diagnosis is made via fundal height measurement, as well as ultrasound. Complications can include increased perinatal fetal morbidity and mortality. Treatment is directed at identifying the underlying etiology, as well as close fetal monitoring with nonstress tests (NST), biophysical profile (BPP), contraction stress test (CST) and umbilical doppler velocimetry.



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Pathophysiology

Slowed Fetal Growth

Snail

Intrauterine growth restriction is defined by the fetus growing slower than it normally should. The fetuses are small for gestational age (SGA), and are below the 10th percentile for weight. Additionally they develop decreased internal organ size.

Symmetric Type

Symmetrical Shape

Symmetric IUGR accounts for 20% of cases, and the insult occurs early in pregnancy. In symmetric IUGR, the overall fetus is small. Early insults to fetal growth, such as chromosomal anomalies, congenital infection, or maternal drug use, can result in symmetric IUGR.

Factors Early in Pregnancy

Early-morning Sun and Pregnant-woman

As a general rule, fetuses with this type of IUGR pattern may present at an earlier stage in gestation compared with the asymmetrical IUGR pattern.

Genetic (Chromosomal) Abnormalities

Gene Abnormalities

Early factors which contribute to IUGR include chromosomal abnormalities, such as aneuploidy syndromes, such as Edwards' syndrome, Patau's syndrome and other trisomies.

Congenital Infections

Infectious-bacteria

Infections, such as TORCH infections are also causes of symmetric intrauterine growth restriction.

Asymmetric Type

Asymmetrical Shape

Asymmetric IUGR accounts for 80% of cases. It is defined as preservation of the head circumference, while the abdominal circumference and femur length lag behind. Late insults to fetal growth, such as poor maternal health or placental insufficiency secondary to hypertension, drug use, poor nutrition or placenta previa, can result in asymmetric IUGR.

Preserved Head Circumference

Normal-head with Small-body

In asymmetric IUGR, the head circumference (HC) is normal, but comparatively, other biometric parameters are reduced, such as abdominal circumference (AC).

Factors Late in Pregnancy (2nd / 3rd trimester)

Late-moon and Pregnant-woman

Compared to symmetric IUGR, asymmetric IUGR presents later in pregnancy, typically in the 2nd and 3rd trimesters. This is the more common type of the two presentations of intrauterine growth restriction.

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Placental Insufficiency

Broken Placenta-present

Placental insufficiency is the most common cause of asymmetric intrauterine growth restriction.

Diagnosis

Ultrasound

Ultrasound-machine

An ultrasound is necessary to make the diagnosis of IUGR. Sonographic estimation of fetal weight is the best method for identifying IUGR. Abdominal circumference (AC), head circumference (HC) and femur length (FL) measurements are also obtained during ultrasound in order to assess for symmetric versus asymmetric IUGR.

< 10th Percentile (for SGA)

Less-than (10) Tin

In intrauterine growth restriciton, the estimated fetal weight during pregnancy is equal to or below the 10th percentile for gestational age. This classifies the fetus as being small for gestational age (SGA).

Decreased Fundal Height

Down-arrrow Funnel

In order to assess fetal growth, the distance between the upper edge of the pubic symphysis and the top of the uterine fundus is measured. Fundal height, measured in centimeters, roughly corresponds to the gestational age in weeks between 16 to 36 weeks for a vertex fetus. IUGR may be suspected when the measured fundal height is less than the expected, based on the gestational age. When there is a significant discrepancy between the fundal height and gestational age in weeks (between 16 and 36 weeks), an ultrasound may be ordered for further evaluation.

Complications

Increased Perinatal (Fetal) Morbidity and Mortality

Up-arrow Morbid Fetal Death

Perinatal morbidity and mortality is significantly higher in infants with IUGR than infants born weighing between the tenth and 90th percentile. Some causes of morbidity in the fetus include meconium aspiration, necrotizing enterocolitis, hypoglycemia, respiratory distress, hypothermia and thrombocytopenia. IUGR also has long term consequences, including increased risk of adult onset coronary artery disease, type II diabetes mellitus, stroke and hypertension.

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