

MULTIPLE GESTATION

LEARNING OBJECTIVES

Understand the classification of multiple pregnancies.

Understand risk factors for multiple pregnancies and why prevalence is increasing.

Understand the increased complications that occur in multiple pregnancies.

Understand the antenatal care of women with multiple pregnancies.

Incidence and epidemiology:

Twins account for about 1-2% of all pregnancies with 80% being dizygotic & 20% monozygotic. The rate of multiple births in the USA increased dramatically with the use of ovulation induction to reach in 2002 to 3% of all pregnancies.

The incidence of DZ twins varies with:

- 1. Ethnic group:** the spontaneous incidence of twins is greater in Negro race, reaching 1 in 30, and lower in Mongol race (1 in 150).
- 2. Maternal age:** the incidence of twin pregnancies rises slightly with increasing maternal age up to 40. (2% at 35y.) Rising to a peak between 35-39y.
- 3. Increasing parity:** 2% after 4 pregnancies. A woman who has given birth to twins is 10 times more likely to have multiple conceptions in a subsequent pregnancy than a woman who has not previously had twins.
- 4. The treatment of anovulation and other causes of infertility** (IUI and IVF) make an important contribution to the incidence of twinning. Ovulation induction by clomiphene 8% or gonadotrophins 24% -----
- 5. Family history:** a tendency for multiple pregnancies is inherited and it occurs more frequently in certain families (Dizygotic twin).

Classification:

The classification of multiple pregnancy is based on:

- Number of fetuses: twins, triplets, quadruplets, etc.
- Number of fertilized eggs: zygosity.
- Number of placentae: chorionicity.
- Number of amniotic cavities: amnionicity.

While the incidence of MZ twins are similar in all ethnic groups and does not vary with maternal age, parity or method of conception.

Varieties of Twins

Twins may be binovular (dizygous) or uniovular (monozygous)

Binovular twins (DZ)

- Arising from fertilization of two ova from the same or opposite ovaries.
- Each fetus has its own membranes, chorion, and amnion, and its own placenta (dichorionic diamniotic placentation).
- When the implantation sites happen to be close together the placentas may become fused, but there is never any anastomosis between their blood vessels.
- The fetuses may be similar or different in sex.
- Their genetic material will be different.
- This variety of twins is four times more common than the uniovular variety.

Uniovular twins (MZ)

Are developed from a single ovum which after fertilization has undergone division from two embryos.

- When a single embryonic mass splits into 2 within three days of fertilization (occurs in 1/3 of MZ) → each fetus has its own amniotic sac and placenta (diamniotic and dichorionic) they are the same as DZ twins but the fetuses will be identical.
- When embryonic splitting after the third day following fertilization → there is vascular communication within the 2 placental circulation (monochorionic diamniotic placentation) this accounts for 2/3 for MZ twins.
- Embryonic splitting after the 9th day following fertilization → (monoamniotic monochorionic twins). 1% of MZ.
- Splitting after the 12th day → conjoined twins (rare)

Maternal Responses:

The physiological response to twin pregnancy may be summarized as:

An exaggerated adaptation of all systems especially of the cardiovascular system.

- Cardiac output increased about 20% more than usual increase.
- The normal increase in plasma volume during pregnancy is much greater and the normal increase in total circulating red cell mass shows an additional increment of about 250ml.
- hematocrit and hemoglobin values are even lower than in singleton pregnancies (because this is not in proportion to the increment in plasma volume)

* Other systems

- increase in respiratory tidal volume - A higher glomerular filtration rate.

All the changes seem to be due to increased demands to meet the needs of the fetuses.

Maternal complications, which result from exaggerated physiological responses to multiple pregnancies, are hyperemesis gravidarum and anemia.

Diagnosis of twins

- Early symptoms of pregnancy such as morning sickness may be more pronounced and pregnancy hypertension is common.
- The women may notice an unusual degree of abdominal enlargement and excessive fetal movement.
- In late pregnancy, she may have discomfort and shortness of breath because of the large size of the uterus.
- Anemia is common. Apart from the fact that there is a great increase in plasma volume, there is a double fetal demand for iron, megaloblastic anemia is also common.
- edema of the legs is common and any tendency to haemorrhoid or varicose veins of the legs is accentuated.

On examination

1. The uterus is found to be larger than expected from the duration of gestation.
2. Polyhydramnios may occur with twins, adding to the size and confusing the diagnosis.
3. Two fetal heads can be felt.
4. Both backs and breeches may be identified and an unusual number of fetal parts.
5. If heart movements are detected with the U\S in separate areas or directions the diagnosis of twins is almost certain.

By U\S scan in early pregnancy: separate gestational sacs can be identified from about the 7th week or sooner. If routine scanning of all women is carried out at 16 weeks twins should rarely be missed.

If antenatal supervision is poor the diagnosis sometimes is missed until delivery or after the birth of the first twin.

Complications of pregnancy :

- **Preterm labor and birth**

About half of the twins and nearly all higher-order multiples (triplets, quadruplets, etc.) are premature (born before 37 weeks). The higher the number of fetuses in the pregnancy, the greater the risk for early birth. Premature babies are born before their bodies and organ systems have completely matured. These babies are often small, with low birth weights (less than 2,500 grams or 5.5 pounds), and they may need help in breathing, eating, fighting infection, and staying warm. Very premature babies, those born before 28 weeks, are especially vulnerable. Many of their organs may not be ready for life outside the mother's uterus and may be too immature to function well. Many multiple-birth babies will need care in a neonatal intensive care unit (NICU).

- **Pregnancy-induced hypertension**

Women with multiple fetuses are more than three times more likely to develop high blood pressure. This condition often develops earlier and is more severe than singleton pregnancy. It can also increase the chance of placental abruption (early detachment of the placenta).

- **Anemia**

Anemia is more than twice as common in multiple pregnancies as in a single birth.

- **Birth defects**

Multiple birth babies have about twice the risk of congenital (present at birth) abnormalities including neural tube defects (such as spina bifida), gastrointestinal, and heart abnormalities. This increased risk is limited to identical twins.

- **IUGR** : Likely to occur due to uterine overcrowding & usually the growth lag is 2 weeks

- **Miscarriage**

A phenomenon called the vanishing twin syndrome in which more than one fetus is diagnosed, but vanishes (or is miscarried), usually in the first trimester, is more likely in multiple pregnancies. This may or may not be accompanied by bleeding. The risk of pregnancy loss is increased in later trimesters as well.

- **Twin-to-twin transfusion syndrome**

Twin-to-twin syndrome is a condition that develops only with identical twins that share a placenta. Blood vessels connected within the placenta and divert blood from one fetus to the other. It occurs in about 15 percent of twins with a shared placenta.

- **Death of one fetus in a twin pregnancy:** in dichorionic twins, in the second or third trimester IUD of one fetus may be associated with the onset of labor, although in some cases, the pregnancy may continue uneventfully and even result in delivery at term. Careful fetal and maternal monitoring is required. By contrast, fetal death in monochorionic twins may result in immediate complications in the survivor. These include death or brain damage with subsequent neurodevelopmental handicap. Acute hypotensive episodes, secondary to placental vascular anastomosis between the two fetuses, result in hemodynamic volume shift from the live to the dead fetus. Death or handicap of the co-twin occurs in up to 30% of cases.

- **Abnormal amounts of amniotic fluid**

Amniotic fluid abnormalities are more common in multiple pregnancies, especially for twins that share a placenta.

- **Cesarean delivery**

abnormal fetal positions increase the chances of cesarean birth.

- **Postpartum hemorrhage**

the large placental area and over-distended uterus place a mother at risk for bleeding after delivery in many multiple pregnancies.

Complications unique to monoamniotic twinning:

Monoamniotic twins share a single amniotic cavity, with no dividing membrane between the two fetuses. They are at increased risk of cord accidents, predominantly through their almost universal entanglements. Many clinicians advocate elective delivery by C/S at 32-34 weeks gestation, as usually this complication is acute, fatal and unpredictable.

Management of twin pregnancy:

Routine antenatal care:

Because of more frequent complications

The first step is to make the diagnosis of multiple pregnancy as early as possible during gestation so that the complications can be detected early.

Visits should be four weekly until 28w, twice weekly to 32w, then weekly.

U/S examination plays a major role in management. **In the first trimester it is used to:**

1. Diagnose the number of fetuses
2. Determine chorionicity
3. Accurately dating pregnancy
4. Detect major fetal abnormalities

In the second trimester it is used to detect fetal abnormalities.

In the third trimester to monitor fetal growth and wellbeing.

In labour to determine presentation and position of the fetuses.

General advice should encourage adequate rest, as many women with twin pregnancy will find themselves tired.

The practice of admitting women with twins to hospital from the 30th to the 35th week is now less common, but it may be advisable if the home conditions are poor because rest will increase the placental blood flow and so improve fetal growth and for specific medical indications .

There is no convincing evidence that the prophylactic use of tocolytic drugs or cervical suture will reduce the incidence of preterm labour in twin pregnancy.

We should advice the patient for routine iron and folic acid supplementation.

Management of twin labour and delivery:

In 70% of twin pregnancies the first fetus presents by the vertex. Malpresentations are common, especially of the second twin, but mechanical difficulty is rare, as the fetuses tend to be smaller.

The second twin is also more at risk than the first from intrapartum hypoxia. If the first twin is presenting by the vertex and there are no other complications, many obstetricians will allow a vaginal delivery with the same contraindications as for singletons.

Labor should be conducted in a well-equipped hospital under the supervision of an experienced obstetrician, with an expert obstetric anesthetist and a pediatrician in attendance.

The first stage:

- It is managed in an ordinary way, labour is not often prolonged and with small fetuses, may be rapid.
- In early labor, an I.V. infusion should be set up, to which oxytocin may be added if uterine contractions decrease following delivery of the first twin.
- Epidural analgesia is useful as it facilitates the manipulation of the 2nd fetus.
- Fetal heart monitoring should be continued throughout the delivery of both twins. A twin cardiotocography (CTG) machine and a portable US machine should be available.
- CS might be performed if:
 - either CTG trace becomes abnormal
 - prolonged delay in the first stage of labor
 - Both twins were breech presentation or lying transversely or the twins were conjoined.

The second stage:

- Is managed in the usual way unless some complications arise.
- Unless the perineum is very lax, an episiotomy should be performed routinely, under local anesthesia if an epidural injection has not been given.
- Immediately after the delivery of the first twin, the abdomen is palpated to determine the lie of the second fetus.

If it is oblique or transverse it is corrected by external version through the lax abdomen to bring one pole of the fetus over the cervix. If this proves difficult internal version and breech extraction should be performed. This is made easier if the second bag of membranes is left intact for as long as possible □ Cord prolapse should be excluded and fetal heart monitoring must be continued.

- Fetal distress of the second twin may occur because:

1. The volume of the uterine cavity is reduced after the delivery of the first twin.

2. There may be a separation of the placenta on which the second twin depends.
3. Cord prolapse.

- Uterine contractions are often stopped for a few minutes after delivery of the first twin. When they start again delivery will occur.
- If the uterine contractions do not return within 5 min. after the delivery of the first twin Syntocinon (2 units in 500ml glucose solution) should be started to accelerate labor. The optimum time interval between births is said to be 10-30min.
- If fetal distress is noted while the second presenting part remains high, the ventouse is the ideal instrument for the vertex presentation, while breech extraction should be performed if the presentation is podalic.

The third stage of labor:

There is an increase risk of postpartum hemorrhage because of:

- The large size of the placental site
- Excessive uterine distention with consequent lack of uterine muscle tone.

This risk is minimized by continuous oxytocin infusion through and for some time after the 3rd stage of labor. A prophylactic injection of syntometrine should be given with the birth of the second twin and the placenta delivered in the usual way.

Complications of labor:

1. malpresentation
 - 45% - both presented by head
 - 35% - one head and the other by breach
 - 10% - both by breach
 - 10% - transverse lie is associated with a cephalic or a breech presentation.

Very rare for both fetuses to lie transversely.

2. postpartum hemorrhage
3. cord prolapse
4. Locked twins. This is a very rare complication occurring in less than 1 in 1000 twin deliveries. Locking may occur when the first twin presents as a breech and the second as a vertex. The after-coming head of the first twin is caught above the chin of the second twin. CS and delivery of the second twin from above is probably the easiest course.

Cesarean section

Elective CS has a place in twin delivery if:

1. The pregnancy is complicated by severe hypertension
2. The woman is old or has a bad obstetrical history
3. The leading twin presents by the breech or transverse lie
4. Preterm labor before 34w

Previous CS

In the presence of a previous lower segment CS the contraindications for trial of vaginal delivery are the same as in singleton, but there are two anxieties about previous Cs in women with twins

1. Over distension of the uterus can lead to excessive thinning of the scar and to its dehiscence
2. A need to manipulate the second twin at delivery might cause scar dehiscence or rupture.

Triples and higher multiple births

The increased use of gonadotrophins and assisted reproduction techniques in infertility has resulted in an increase incidence of triplets and higher multiple births. The perinatal mortality is high and delivery best managed by CS.

Twin-to-twin transfusion syndrome (TTTS): is a rare cause of acute polyhydramnios in the recipient sac of monochorionic twins. It is associated with oligohydramnios and a small baby in the other sac. The condition may be rapidly fatal for both twins; amniodrainage and removal by laser of the placental vascular connections are two therapeutic modalities employed in dealing with this condition.

TTTS is diagnosed based on the following ultrasound criteria:

Single placental mass.

Concordant gender.

Oligohydramnios with maximum vertical pool (MVP) less than 2 cm in one sac and polyhydramnios in the other sac (MVP >8 cm).

Discordant bladder appearances.

Hemodynamic and cardiac compromise.

TTTS may be graded in severity according to the widely accepted Quintero staging:

Stage I: Oligohydramnios and polyhydramnios sequence and the bladder of the donor twin is visible. Dopplers in both twins are normal.

Stage II: Oligohydramnios and polyhydramnios sequence, but the **bladder** of the donor is not visualized. Dopplers in both twins are normal.

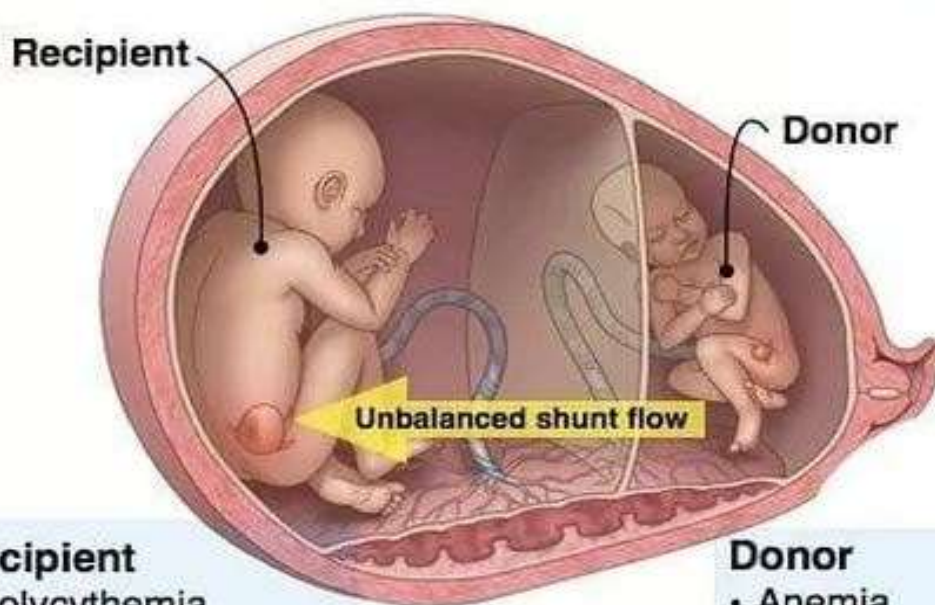
Stage III: Oligohydramnios and polyhydramnios sequence, non-visualized bladder, and **abnormal Dopplers**. There is absent/reversed end-diastolic velocity in the umbilical artery, reversed flow in a-wave of the DV (ductus venosus), or pulsatile flow in the umbilical vein in either fetus.

Stage IV: One or both fetuses show signs of **hydrops**.

Stage V: One or both fetuses have **died**

Twin-Twin Transfusion Syndrome

Serious complication of monochorionic multiple gestations



Recipient

- Polycythemia
- Hypertension
- Polyuria
- Polyhydramnios
- Circulatory overload
- Heart failure
- Hydrops fetalis
- Fetal demise

Donor

- Anemia
- Hypotension
- Oliguria
- Oligohydramnios
- Circulatory insufficient
- Growth restriction
- Renal failure
- Fetal demise

Best wishes

Dr.Zahraa Muhmmmed Jameel