Management of Multiple Pregnancy

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Why are twins important?

- Increase maternal and perinatal morbidity and mortality
- Specific Complications pregnancy and delivery
- Social/family implications
General

• Rising incidence over the last 30 years from 10/1000 to 16/1000

• Currently account for 3% of livebirths

• Maternal mortality 2.5x higher in multiple births

• Preterm birth at least 50% of twin births

• Perinatal mortality 5x higher than singleton

• MCDA twins 3-5X increased risk perinatal morbidity and mortality cf DCDA
Terms:

- **Zygosity**: Refers to whether twins arose from 1 or 2 fertilised eggs
  - One: Monozygous
  - Two: Dizygous

- **Chorionicity**: Whether they share placenta, number of chorionic/outer membranes.
  - Monochorionic: 1/3 of twin pregnancies. Always have vascular connections in the placentas between the babies
  - Dichorionic: 2/3 of twin pregnancies

- **Amnionicity**: Whether they share a sac ie number amniotic/inner membranes
Monochorionic pregnancies at much higher risk
Vanishing twin

• About 23% of twin pregnancies diagnosed on scan at 6 weeks will be singleton at 12 weeks
• Not thought to have any other long term complications
For Monochorionic Pregnancies

• **DCDA**: Division in first 3 days post Fertilisation

• separate placentas and sacs

• 25-30% of monochorionic pregnancies
• **MCDA** split between 4 and 8 days post fertilisation, Share placenta but separate sacs.

• 70-75% of Monochorionic pregnancies
• MCMA split between 8-12 days post fertilisation, share placenta and sac
• 1% of monochorionic pregnancies
• 25% will have a malformation esp cardiac or neurological
Conjoined Twins

- Split from 13 days onwards, share body parts
- Rare
Determination of amnionicity and chorionicity

• Best done by US 11-14 weeks
  • Number placental masses

  • Twin peak: Dichorionic

  • T sign: monochorionic

• Membrane thickness: thicker in dichorionic and thinner in monochorionic
Frequency:

• Spontaneous twin pregnancy
  • 0.6% Asia
  • 1-2% Australia
  • 4% Africa

• Frequency affected by
  • Increasing maternal age
  • Family History
  • Ovulation induction
  • IVF

• Most of the difference is due to Dizygotic twins, rate of Monozygous is fairly constant
Major Challenges: maternal

- Anaemia
- Hyperemesis
- Polyhydramnios
- APH
- Malpresentation
- Increased GDM, PET
- PPH
- Post natal Depression
- 2.5X increased Mortality
Major Challenges: fetal

- Miscarriage
- Congenital anomalies
- Preterm Birth (10%< 32 weeks)
- IUGR
- Twin to Twin Transfusion Syndrome
- sGR
- Antepartum death of a twin
- Cord accident
- CP
- PNMR x4-5 cf singletons
Congenital Malformations

- Congenital malformations are more common in twins particularly cardiac and neurological malformations and particularly for monochorionic twins

- Most MC twins although monozygotic are discordant for malformations
Fetal anomalies in MC twins

• Particularly Midline
  • Ie Cardiac, Neural Tube, Holoprosencephally
  • Mostly just one twin
  • General increase in aneuploidy
Outcomes of twins

• 12.5% deliver < 32 weeks cf 2% singletons

• Risk infant death 29.8% for twins cf 6/1000 singletons

• Cerebral Palsy 4-8x higher in twins than Singletons

• Outcome for the 2\textsuperscript{nd} twin worse than the 1st
Outcomes

- MC twin mortality 4-5x higher than DC
- 2/3 stillbirth and 1/3 neonatal deaths
- Has improved
  - 2007 Scandinavian prospective study showed loss < 24 weeks 14.2% MC and 2.6% c
  - < 36 weeks 17.6% MC and 3.7% DC
Pre-eclampsia

• Women with twins should take low dose Asprin if
  • 1st pregnancy
  • > 40 years of age
  • > 10 years since the last pregnancy
  • BMI > 35
  • Family history PET
  • P/Hx PET
Prematurity

• Women at increased risk if they have had a preterm birth in a prior singleton pregnancy
• Cervical length less predictive in twins
• Don’t use untargeted steroids
• 60% of twins will deliver spontaneously by 37 weeks
What doesn’t work

• Bed rest has not been shown to reduce preterm birth or PNMR (in the absence of specific complications)

• No role routine Progesterone

• No role routine cervical cerclage

• In absence of other complications CS has not been shown to be more or less safe than vaginal birth for twins in Multinational RCT
Monitoring

• Monochorionic
  • Diagnose early and determine chorionicity
  • NT or NIPT for T21 screening
  • Scans every 2 weeks from 16 weeks looking at growth, liquor, bladders, dopplers and Middle cerebral Artery flows
  • See every 2 weeks from 16 weeks and weekly from 28 weeks
  • Plan delivery from 36 weeks

• DCDA
  • Diagnose early and determine chorionicity
  • NT or NIPT for T21 screen
  • Scans every 3-4 weeks after the 19 week scan
  • Visits weekly from 32 weeks
  • Plan delivery from 37 weeks
Ultrasound in Monochorionic twins

• Dating
• Chorionicity
• NT: a difference in NT of 20% between twins increases the risk of TTTs
• Cervical length
• Fetal anomalies
• Specific conditions twins
Growth

• Twins growing to their full potential should follow singleton curves till 32-35 weeks of gestation
• MCDA twins have an increased risk of unexplained late intrauterine death and acute TTTs in labour

• For otherwise uncomplicated MCDA twins the risk of stillbirth increases steadily with gestation from 32 to 37 weeks

• Risk of stillbirth is higher than for DCDA pregnancies
Timing of birth in uncomplicated twin pregnancy

• From 37+0 in DCDA twins

• From 36+0 after steroids in MCDA twins

• From 32+0 weeks after steroids in MCMA twins
Vaginal delivery if:

- Diamniotic
- Twin 1 cephalic
- Twin 2 not more than 500g heavier than twin 1
- No other reason for CS
- Must have the capacity to continuously monitor both twins
- About 30-40% of planned vaginal delivery will end up in CS
Specific Complications of Monochorionic Twins

- Twin to Twin Transfusion

- sGR: Selective Intrauterine Growth Restriction (Unequal placental Sharing)

- TAPS

- Death of a co-twin

- Acardiac twin TRAP sequence
Main problem = vascular anastomoses

Artery to vein: Unidirectional-
Blood flows from one baby to the other

Artery to artery: bidirectional-
protective

Net imbalance causes problems
Twin to Twin Transfusion Syndrome

• Shared blood vessels in the placenta cause an imbalance of blood flow from one fetus to the other
• 15% of monochorionic twin pregnancies
• Accounts for 20% of twin stillbirths
• Screen with 2 weekly US from 16 weeks.
• If membrane folding or discordant amniotic fluid do scans weekly
Two forms TTT

- 2 Forms
  - TOPS: Twin Oligohydramnios/polyhydramnios sequence
    - 10% of monochorionic twins
    - Usually seen in the second trimester
    - Usually not new onset after 26 weeks
    - DONOR: Oligohydramnios, poor growth and abnormal dopplers
    - RECIPIENT: Polyhydramnios, polycythaemia, cardiac dysfunction progressing to failure and hydrops
2nd form: TAPS (Twin Anaemia/Polycythaemia Sequence)

- Due to very slow transfusion from tiny (<1mm) anastomoses
- Gradual so not characterised by marked fluid discordance or cardiac dysfunction
- Usually recognised in later pregnancy
- May be first apparent in the newborn period
- Fetal anaemia may require in utero treatment
TAPS: due to small deep anastomoses

- Diagnosed by differences in the Middle Cerebral Artery Peak Systolic Velocity on US
- MCA PSV > 1.5x the median seen in anaemia
- MCA PSV < 0.8x the median is seen in Polycythaemia
- Large discordance in Hb levels without amniotic fluid discordance
- More common after Laser (10%) but seen in untreated MCDA twins as well (5%)
Treatment

• Amnioreduction

• Laser of placental vascular anastomoses in 2nd Trimester: Superior to serial amnioreduction. Method of choice < 26 weeks.
  • Significant risk to pregnancy
  • May be treatment of superficial anastomoses or effective division of the placenta into two (Solomon Method)
  • After treatment aim delivery if all OK 34-36+ weeks
Selective Growth Restriction

- Unequal share of the placenta
- Complicates 20-25% of MCDA pregnancies
- Discrepancy > 20% on EFW associated with increased PNMR
- Doppler studies help predict risk esp Absent or Reversed diastolic flow
- Early onset consider selective TOP of smaller twin by cord ablation
- Progress to fetal loss is slower in MC twins because the anastomoses in this case help the baby
3 Groups

• I : Positive flow in both arteries

• II : Absent or reversed end diastolic flow in one or both

• III : Cyclical pattern of flow over several minutes
Delivery with sGR

- Type I but still growing 34-36 weeks
- Type 2 and 3: 32 weeks or earlier
In TTT and sGFR even if monitoring and management is optimal acute transfusional events can occur that are neither predictable or preventable
Death of a co-Twin

• Common in early pregnancy: vanishing twin or

• fetus papyraceous
  • Risk to the remaining twin still higher than for singleton
Death in 2\textsuperscript{nd} and 3\textsuperscript{rd} trimester

- Complicates 0.5-11.6\% of twin pregnancies in different series

- Most FDIU and nearly all the consequent neurodevelopmental issues are in Monochorionic pregnancies

- 50\% due to TTTs in monochorionic twins
• More likely if IUGR or velamentous cord insertion

• In Monochorionic twin pregnancy death of a co-twin after 20 weeks risk of death is approx 15% and neurological damage 26% (Abnormal imaging 34%)

• Risk to the survivor is due to acute TTTs and hypotension in the survivor as well as thromboembolic changes from activation of the clotting cascade
Death co-twin in DCDA twins

• In DCDA twins FDIU is usually a consequence of IUGR

• Can also be due to abruption, GDM, fetal anomalies, diabetes, infection and cord complications

• Risk of FDIU increases with growth discordance and particularly when discordance > 30%

• Loss of one twin in PET may lead to a temporary improvement of the underlying condition
Death co-twin in DCDA twins

- In Dichorionic twin pregnancy, risk of death to the survivor after death of a co-twin is 3%, neurological damage 2% (Abnormal imaging 16%)
Labour after death of a co-twin

• In all cases consider steroids for lung maturity and magnesium for neuroprotection

• Labour often occurs within 2-3 weeks of recognition of a co-twin’s death but may be delayed months

• Maternal coagulopathy is rare and esp before 4 weeks but coags and fibrinogen should be done before regional block
Cause of single fetal death

Continuing

- DCDA twins
  - Weekly CTG
  - Weekly US
    - Deliver
    - Deliver ≥34W

- MCMA twins
  - >28W
    - Deliver
  - <28W
    - Intensive monitoring
    - Intracranial pathology
    - Deliver at 28W
    - Consider feticide
    - MRI after 3W

- MCDA twins
  - Weekly US
  - MRI after 3W
    - No intracranial pathology
    - Deliver at 37W
Delivery after death of a co-twin

• In DCDA pregnancies risk to co-twin is small and delivery should be delayed till at least 34 weeks as long as no acute risk to survivor
• In MCDA twins when fetal death has occurred it is thought that any damage to the survivor has already been inflicted.

• Delay delivery till assessment of the fetal brain over subsequent weeks by US and MRI shows degree of damage (MRI useful at 4 weeks)

• High MCA PCV showing anaemia in the co-twin is associated with a worse prognosis
Mortality in the other twin after death of co-twin

- MC Twins 12%
- DC twins 4%
• Death of a co-twin in monochorionic pregnancy can cause
  • Multicystic encephalomalacia, PVL, porencephaly, microcephaly
  • Multi organ failure
  • Death of other twin

• In both monochorionic and dichorionic pregnancies it can cause
  preterm labour and delivery

• Increased risk of neurodevelopmental abnormalities in the survivor
  both in MC and DC pregnancies
Twin Intrapartum management

• Have enough staff
• All need an IV line and Gp and Hold
• All need continuous EFM both twins
• Epidural: wise in case need manipulations of the 2\textsuperscript{nd} twin
• Need a theatre available and experienced staff
• Anaesthetist available
• Paed present
• Manage the first twin birth as for a singleton
• Careful about cutting the nuchal cord which can rarely belong to twin 2
Delivery of twin 2

• Clamp cord twin 1 as soon as delivered
• Withold oxytocin
• Immediately determine the lie/ presentation and station of twin 2
• US useful here and should be in the room
• May need to commence syntocinon infusion if contractions decrease
• Can wait for delivery of 2\textsuperscript{nd} twin while FHR OK
• External cephalic or internal podalic version may be needed
• Once contracting and lie longitudinal encourage pushing
• ARM when head in pelvis or as part of internal podalic version
• Beware of cord prolapse
• Synto after ant shoulder twin 2 (IV may be better than IM)

• After placentas out prophylaxis for PPH
Caesarean section

- 1st twin breech
- Discordant growth
- Twin and one other major obstetric risk factor
- Maternal preference
MCMA twins

• 1% of Monozygotic twins
• Very high risk of fetal loss and neonatal mortality due to cord entanglement, prematurity and congenital malformations and TTTs
• Sudden intrauterine death 5-10% after 32 weeks
• Generally elective delivery by CS after steroids at 32 weeks
• Almost all have cord entanglements