

Intensive Care Nursery House Staff Manual

Multiple Births

INTRODUCTION: Multiple gestations are high-risk pregnancies. The rate of monozygotic (MZ) twins is relatively constant at 3-5/1000 deliveries, whereas the dizygotic (DZ) twinning rate varies from 4-50/1000 deliveries and is influenced by race, heredity, maternal age, parity and nutrition. The incidence of multiple births is increasing, partly due to older maternal age and use of assisted reproductive technology.

ZYGOSITY and PLACENTATION: MZ twins result when a single ovum is fertilized and subsequently divides into two embryos. The placenta-membrane relationship, determined by timing of the division (Table 1), may be dichorionic-diamnionic (di-di), monochorionic-diamnionic (mono-di), or monochorionic-monoamnionic (mono-mono). Conjoined twins are very rare and occur when the embryo incompletely divides after the 13th day of fertilization. DZ twins develop from two fertilized ova and the placenta is always di-di. Higher-order fetuses may be either MZ or multizygotic. The perinatal mortality rate is closely related to type of placentation (Table) with mono-mono twins at highest risk. Zygosity can be determined for most twins by placentation, gender and blood type. Immunologic studies or DNA analyses can prove zygosity.

Table. Zygosity and placentation.

<u>Zygosity</u>	<u>Timing of division</u>	<u>Placentation</u>	<u>Percent of twins</u>	<u>Vascular shunts</u>	<u>Perinatal mortality</u>
MZ	first 3d	di-di	10%	very rare	low
	4 th -8 th d	mono-di	22%	very common	higher
	9 th -13 th d	mono-mono	1%	very common	highest
DZ	2 fertilized ova	di-di	66%	very rare	lowest

Note: Di-di placenta can develop with either DZ or MZ.

MANAGEMENT: Early diagnosis and close follow-up are critical in multiple pregnancies. Early signs include increased uterus size for dates, multiple fetal heartbeats and elevated maternal serum alpha-fetoprotein levels. Ultrasonography can confirm the diagnosis, determine the type of placentation and identify anomalies and complications.

COMPLICATIONS: Multiple pregnancies have increased incidences of preterm delivery, intrauterine growth restriction (after 29 weeks in twins, 27 weeks in triplets), congenital anomalies (MZ>DZ), polyhydramnios, oligohyramnios, cord accidents, fetal demise, malpresentation and birth asphyxia. A unique risk in multiple pregnancies, the **twin-twin transfusion syndrome (TTTS)** results from vascular anastomoses between circulations of MZ twins, or very rarely in fused dichorionic placentas. The clinical presentation varies with types of anastomoses (A-A, A-V and V-V) and degree and time course of transfusion. Ongoing transfusions from early gestation via A-V shunts leads to the classic TTTS. The donor exhibits anemia, growth retardation and oligohydramnios. The recipient develops hypervolemia, polycythemia, increased growth, polyhydramnios and cardiac hypertrophy. Hydrops fetalis may develop in either twin. Recent transfusion

leads to anemia in the donor and polycythemia in recipient. Acute and massive shift of blood may occur via A-A or V-V anastomoses when perfusion pressures become unbalanced at birth or after demise of one fetus. Demise of one twin places the survivor at risk for exsanguination, acute hypotension and embolization (which may lead to CNS lesions), limb amputation, intestinal atresia and gastroschisis. TTTS complicates 5-15% of all monochorionic twins and has 80-100% mortality without treatment and a 15-50% risk of handicap in survivors. Significant growth discordance (>25% disparity in weights) increases perinatal mortality. In severe cases, the SGA fetus is compacted into a small, oligohydramniotic sac, and is referred to as a “stuck twin,” in whom pulmonary hypoplasia is common. Cord entanglement and knotting are frequent in mono-mono twins, which accounts for their high mortality rate (50-60%). Diagnosis of TTTS is suggested when monochorionic twins show a hemoglobin difference of >5 gm/dL. Vascular communications can be demonstrated during pregnancy by ultrasonography or by examination of placenta at birth. Currently, UCSF is participating in a multi-center trial of obstetrical intervention for TTTS (see section on Fetal Therapy, P. 166).

PEDIATRIC MANAGEMENT of MULTIPLE BIRTHS:

- Obtain **information** needed for preparing for resuscitation including number of fetuses, gestational age, estimated fetal weights, type of placentation, presence of anomalies and complications (*e.g.*, TTTS, hydrops, stuck twin).
- A **pediatric team with personnel assigned to each infant** should attend the delivery and be prepared to resuscitate infants with asphyxia (the 2nd born twin is at greater risk for asphyxia) and other identified complications and anomalies.
- Examine** infants for signs of prematurity, growth retardation and anomalies. Rapidly **measure chem strip and hematocrit** and begin appropriate therapy.
- If **TTTS** is suspected, have whole blood or PRBCs cross-matched against the mother available in resuscitation room. Measure arterial and central venous pressures and arterial pH and blood gas tensions immediately after initial resuscitation to assess the circulatory status. If polycythemia is present, reduce hematocrit (see **Polycythemia**, P. 112). Management of the anemic donor is less straightforward. Recent acute blood loss requires the same management as other hypovolemic infants (see **Neonatal Shock**, P. 101). The donor with prolonged, severe anemia may not tolerate blood volume expansion. In this case, perform **partial exchange transfusion with PRBCs** to raise hematocrit (see section on Neonatal Anemia, P. 108).

OUTCOME:

Perinatal mortality and morbidity for twins are five times higher than for singletons. Prematurity, low birth weight and TTTS are the major contributors. Higher-order multiples deliver earlier and, therefore, are at even greater risks. Twins, especially MZ, have higher incidences of cerebral palsy and mental retardation.