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Ethical considerations in the care of complicated twin pregnancies

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A B S T R A C T

Twin gestations are increasing in prevalence worldwide, and are potentially subject to medical complications which present uniquely complex ethical and psychosocial challenges for the pregnant patient and obstetrician to navigate. In this article, we explore these issues as they relate to medical decision-making in cases of discordant growth and discordant anomalies in both monochorionic and dichorionic twin pregnancies, including those affected by twin–twin transfusion syndrome, with particular attention to scenarios in which the individual fetuses hold competing interests. For each of these scenarios, we consider how decisions may positively or negatively impact one or both fetuses, and how familiarity with population outcomes, as well as sensitivity to the complex psychosocial circumstances surrounding these pregnancies, can support and inform shared decision-making.

1. Introduction

The incidence of twin gestations is increasing worldwide, with 33.9 per 1000 pregnancies resulting in a twin birth in the USA in 2014 [1]. This increase is related to more frequent use of assisted reproductive technology, as well as the delay of childbearing until more advanced maternal ages. Multiple gestations as a group are at a higher risk of complications, the most frequent being prematurity, with 58% of all twins being born prior to 37 weeks gestation, and 10–11% delivering prior to 32 weeks [1]. In this article, we examine the ethical issues associated with management of complicated twin pregnancies. With all pregnancies, both maternal and neonatal outcomes must be optimized, but multiple gestation pregnancies pose special risks due to the addition of the potentially competing interests of the separate fetuses [2]. Additional complications associated with twinning include the presence of a congenital anomaly in one twin, selective intrauterine growth restriction (IUGR), and the many other complications associated with identical twins. All complications may result in premature delivery and associated sequelae. Decisions related to pregnancy management are more complex when they involve weighing the maternal risks against the benefits or risks to, or between, individual fetuses, especially when risks are disproportionately carried by one twin.

Chervenak and McCullough have argued that the fetus is not a separate patient and that any clinical ethical judgment cannot be accomplished without reference to the pregnant woman [3], an assertion we will maintain in this article, although our analysis will be largely limited to the consideration of risks posed to one or both fetuses, and will not explore risks to the health of the mother. The traditional ethical principles of autonomy and justice will not be our main focus. Prior to delivery, autonomy pertains to the pregnant woman's self-determination with regard to her pregnancy and her health; in some instances and locations, this autonomy is limited by legal restrictions on pregnancy termination. Considerations of equity in access to obstetric and fetal procedures (due to financial or geographic limitations, for example), or whether these interventions represent good use of limited health care resources, are important but are outside of the scope of this article. The principles of beneficence and maleficence are relevant to the extent that potential benefits and harms of various treatment decisions for each fetus are considered. It is important to consider these principles in the context of complex shared decision-making when the best interests of the two fetuses are misaligned. Other factors to be weighed include individual patient values, and a recognition that differences in background and perspective among antenatal counselors – including potentially differing perspectives of the pediatrician compared to the obstetrician – may also impact decision-making. Antenatal counseling in these scenarios requires comprehensive understanding of the relative risks of twins and of the procedures associated with the treatment options which may be offered to patients. Ethical challenges in the care of women with

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higher order multiple gestations are also worthy of exploration but are beyond the scope of this article, as are considerations around in-vitro fertilization (IVF) technologies, and selective reduction of healthy fetuses.

2. Types of twinning

The two most important factors in determining appropriate management and counseling regarding the risks of a twin pregnancy are whether twins are identical (monozygotic) or fraternal (dizygotic), and whether they share a placenta. Whereas all dizygotic twins are dichorionic (one placenta for each fetus), not all dichorionic twins are dizygotic. One-third of monozygotic twins are dichorionic with separate placentas. For the two-thirds of monozygotic twins who share a placenta, early recognition of chorionicity (the number of placentas), which can be done with certainty prior to 14 weeks gestation [4], is important. Not only is this important information for determining the overall risks to the pregnancy, it also has significant impact on the balance of risks to a co-twin should complications develop. Delayed or incorrect identification of the type of twinning may result in ethical challenges for the obstetrician; it has the potential to result in incorrect prenatal monitoring, poorly informed counseling, or inappropriate interventions.

Advanced maternal age is associated with a higher incidence of twin gestation both intrinsically and related to infertility treatments [5]. The use of assisted reproductive technologies increases the chance of both fraternal and identical twinning. Dizygotic twinning is increased by ovulation induction agents as well as transfer of more than one embryo at the time of IVF. Monozygotic twinning, in which the fertilized egg divides to create two embryos, is observed twice as frequently with IVF when transfer of the embryo is undertaken on day 5 after fertilization compared with day 3 embryo transfers (odds ratio: 2.04; 95% confidence interval: 1.29–4.48) [6], and the current trend is for an increasing number of IVF transfers to occur on day 5 as more parents are using preimplantation genetic screening [6,7]. Ethically appropriate counseling around any complex twin pregnancy requires recognition by the counselor that the expectant mother's experience with the given pregnancy complication might be informed by having already struggled with delayed childbearing or infertility.

3. Selective reduction in twin gestation

Selective reduction may be a relevant consideration in both monochorionic and dichorionic pregnancies. Because pragmatic consideration of procedural options and the associated risks apply to multiple scenarios described below, these are presented in aggregate here. We will not explore the full spectrum of ethical considerations around selective reduction or review the potential legal limitations to this procedure, but familiarity with these is essential to appropriate counseling [8].

Gestational age at the time of a selective reduction procedure impacts the risk of the procedure. Early gestation selective reduction in a dichorionic gestation is associated with a 3–5% risk of complications including loss of the entire pregnancy [9,10]. As gestation advances, the risk increases to an 8–10% risk of complications for a procedure performed in the late second trimester. Despite the risk of loss of the entire pregnancy, the risk of premature delivery for the continued pregnancy remains less after early selective reduction than when the multiple gestation is continued [11]. Counseling around the relative risks of these procedures, and the others discussed in this article, may be complicated by the reality that many patients have limited health, numerical, and statistical literacy [12,13].

Selective reduction for monochorionic twins has more risk than for dichorionic twins. Due to the shared blood supply between the monochorionic twins, the procedure cannot be undertaken until the mid-second trimester and requires more expertise to perform. The procedures utilized – radiofrequency ablation (RFA) or bipolar cord coagulation – have a higher risk of pregnancy loss (11–24%) as well as a higher residual risk of prematurity relative to the methods utilized in dichorionic gestation [14,15].

The increasing risk of selective reduction as a pregnancy advances is salient to the emotionally challenging circumstances that lead pregnant women to consider this procedure. A patient might present for care at a referral center capable of performing selective reduction having started the “diagnostic odyssey” first in their primary obstetrician's office with initial detection of a problem, then with confirmation of the problem following a repeat ultrasound at a specialized center, finally resulting in referral to a tertiary care center. These steps might already have resulted in confusion or anxiety for the expectant parents, who now likely face time pressure to decide whether to pursue selective reduction. These women, like any woman considering pregnancy termination, might have previously held strong moral opposition to abortion, or be part of communities that do not support this choice. They might never have previously considered that this would be a decision they would have to make, and might not seek community or family support for fear of stigmatization [16]. Loss of normal pregnancy experience, and loss of “social acknowledgement of the expected baby” has been identified as a source of perinatal grief for expectant parents [17]. Additional complexity can also occur in these scenarios if the provider also has strongly held personal feelings about pregnancy termination.

4. Complications of twin pregnancies

4.1. Selective intrauterine growth restriction

Patients carrying a twin gestation have a 20% risk of IUGR in at least one of the fetuses, which increases to a 69% risk of IUGR if there is discordant growth between the twins [18]. This is significantly higher than the 10% incidence of IUGR seen in the general population. Fetuses with IUGR have an increased risk of intrauterine fetal demise (IUFD) [19]. Current obstetric management includes close surveillance until delivery, with preterm delivery considered if there appears to be worsening of the fetal condition, resulting in an increased risk of iatrogenic prematurity and associated postnatal complications.

For a twin gestation, differential growth may raise questions regarding the optimal timing of delivery to avoid intrauterine demise. When there are two separate placentas, the condition of one fetus does not directly affect the survival of the co-twin, but a decision to deliver obviously impacts both. The patient and medical team must decide whether to proceed with delivery to save one fetus, while putting the other, normally grown fetus at risk of prematurity and its potential long-term sequelae. The unaffected fetus has no identified risk with continuing the pregnancy, only benefit. This balancing act is most precarious when early delivery is at a gestational age that carries significant risk of complications of prematurity. In these cases, the expectant parents' values are paramount to decision-making; these patients must consider whether providing an opportunity for survival of both twins is the dominant priority, or whether it is reducing risk of morbidity and long-term sequelae of prematurity in a single survivor. For many parents, the salient consideration is whether avoidance of neurodevelopmental impairment in the healthy twin outweighs the risk of non-survival of the growth-restricted twin. Some parents may prioritize “bringing home two babies,” and be willing to accept the

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