Best on Time, Not a Little Early
Gestational Age and Outcomes for Neonates With Congenital Heart Disease

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Human gestation lasts 40 weeks from the date of the last menstrual cycle.1,2 Neonates born 3 weeks before (37 weeks gestation) through 2 weeks after 40 weeks of gestation are considered as being born at term. This classification is based on the presumption that no differences in neonatal outcomes exist for those born during this 5-week period. Neonates born at or after 37 weeks of gestation, but before 39 weeks gestation, are thought to have matured adequately to allow an uneventful transition to postnatal life. Elective delivery on or after 37 weeks of gestation is therefore being increasingly used for medical (maternal and fetal) and nonmedical reasons.2,3 Recent research on gestational age and outcomes has shown that considerable differences exist in mortality and morbidity for neonates born during that 5-week time period.4-9 These reports also show that otherwise healthy neonates born at early-term (37 or 38 weeks) gestation have increased risk of poor outcomes in comparison with those born later at term (39 or 40 weeks) gestation.

Neonates born at early-term gestation have been shown to have a higher incidence of respiratory failure requiring mechanical ventilation, surfactant deficiency and hyaline membrane disease, transient tachypnea of newborn, need for neonatal intensive care unit admission, low 5-minute Apgar scores, and hypoglycemia than those born at term gestation.2,3,10 Tita et al7 studied the association of early-term delivery and a composite neonatal mortality and morbidity outcome containing neonatal death, respiratory complications, hypoglycemia, sepsis, and the need for neonatal intensive care in a cohort of neonates delivered electively by repeat cesarean delivery at or after 37 weeks gestation. In comparison with neonates born at 39 weeks gestation, those born at 37 (adjusted odds ratio for poor outcome, 2.1) and 38 (adjusted odds ratio for poor outcome, 1.5) weeks gestation had increased odds of the poor outcomes. Other studies have shown similar results for neonates born electively at early term for nonmedical indications.

Some studies have also shown that poorer outcomes for early-term deliveries may be more common in those delivered by elective cesarean delivery before the onset of labor.2,7 Because these concerning findings have been consistent in many investigations, efforts to reduce the rate of elective delivery without medical indications before 39 weeks gestation are underway.2 Early-term delivery may be needed for certain medical indications including maternal or fetal conditions, and, in some circumstances, early birth may improve neonatal outcomes.2,11,12 A committee opinion statement from The American College of Obstetrics and Gynecologists and The Society of Maternal–Fetal Medicine (opinion numbers 560 and 561) lists maternal and fetal conditions including fetal congenital malformations where preterm (birth before 37 weeks gestation) or early-term delivery may be considered.2,11 Several studies have shown that neonates with a prenatal diagnosis of congenital heart disease are born sooner than those without a prenatal diagnosis.13,14 Reasons for the early delivery of children with prenatal diagnosis of congenital heart disease are largely unknown. However, one commonly cited reason for elective early delivery of neonates with congenital heart disease is to facilitate better coordination of the complex postnatal care often required by these neonates.14,15 Regardless, it seems that a prenatal diagnosis of congenital heart disease may lead to elective delivery before 39 weeks of gestation, and that these early-term neonates may be subject to increased noncardiac neonatal morbidity similar to those seen with otherwise healthy early-term neonates. Indeed, the association of early gestational age and poor outcomes in neonates with congenital heart disease has been shown to be true in several recent investigations on this topic.14,15

In this issue of Circulation, Costello et al16 investigate whether early-term (37–38 completed weeks of gestation) neonates with congenital heart disease had poorer outcomes than those born at term (39–40 weeks of gestation). These analyses were conducted by using multicenter data from 4784 neonates with congenital heart disease undergoing cardiac surgery soon after birth during the years 2010 to 2011 and reported to the Society of Thoracic Surgeons Congenital Heart Database from 92 US hospitals performing pediatric cardiac surgery. In this study cohort, prenatal diagnosis was present in 46% of neonates, and these neonates had lower median gestational age than those without prenatal diagnosis (38 versus 39 weeks). Nearly one-third (31%) of neonates in this cohort were born at early term. As expected, neonates born at early term had increased postoperative mortality and major postoperative complications and longer length of hospitalization in comparison with those born at term. Furthermore, at the end of their hospitalization, fewer early-term neonates were...
discharged home in comparison with those born at term, indicating continued need for medical intervention and resource use even after hospital discharge in early-term neonates.

These data make a compelling argument that the practice of elective delivery of neonates with congenital heart disease at early term should be discouraged. However, a few issues need careful consideration. First, no information is available on reasons for early-term delivery in this study cohort. A better understanding of reasons leading to delivery at early term, including whether medical indications were present or absent, is essential for the evaluation of the risks and benefits of early versus waiting for term birth. Second, current knowledge on outcomes for early-term neonates with congenital heart disease, including data presented in this article, have focused on evaluating post-surgical outcomes rather than the condition at birth or preoperatively. Given that many factors including gestational age can strongly influence postcardiac surgical mortality, discrimination of risk due to early-term birth from those imposed by cardiac surgery is difficult. The inclusion of variables that describe preoperative condition and management strategies can help to better understand issues related to early-term delivery and help plan specific therapies and timing of surgical interventions. Finally, postponing delivery until term in some cardiac lesions may carry increased risk to the fetus. Thus, information on the risk to fetal health by waiting for delivery until 39 or 40 weeks gestation without maternal or other patient factors for which early-term delivery may be beneficial.

In summary, Costello et al show that neonates with congenital heart disease delivered at early term face higher odds of postoperative mortality and morbidity than those delivered at term gestation. Based on data from this study and previous investigations, the practice of elective early-term delivery in neonates with congenital heart defects without maternal or fetal indications should be discouraged.

Disclosures

None.

References


Key Words: Editorials ■ gestational age ■ heart diseases ■ pregnancy ■ thoracic surgery ■ treatment outcome
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