



Invited Commentary | Obstetrics and Gynecology

Pregnancy After Transplant—Addressing Mode of Obstetrical Delivery Among Solid Organ Transplant Recipients

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Women of childbearing age represent a substantial proportion of organ transplant recipients in the US. In 2020, there were 39 036 solid organ transplants in the US, of which 3276 kidney transplants and 916 liver transplants occurred in women aged 18 to 49 years.¹ Pregnancy in transplant recipients is associated with an increased risk of adverse obstetrical outcomes, including stillbirth and preeclampsia.² For transplant recipients who carry pregnancies into the third trimester, the optimal mode of delivery has been an ongoing area of debate. Although expert opinion on the matter supports a trial of labor in transplant recipients,³ rates of cesarean delivery in clinical practice have been reported to be as high as 50% to 60%.⁴ The reason for the high rate of cesarean delivery in transplant recipients is not well understood. It is unclear whether rates of cesarean delivery are increased owing to the high-risk nature of pregnancy after transplant and associated underlying comorbidities or whether other factors are at play. Likewise, data on the safety of vaginal delivery in this population and the association between mode of delivery and graft survival are limited.

The study by Yin and colleagues⁵ contributes new data on the outcomes of vaginal delivery in solid organ transplant recipients, helping to address some of this debate. The authors found that in a population of 1865 women (1435 kidney transplant recipients and 430 liver transplant recipients), vaginal delivery was not associated with an increased risk of adverse maternal or neonatal outcomes. The rate of successful delivery among women who attempted vaginal delivery was approximately 70%. There was no difference in maternal morbidity by mode of delivery, and of importance, the risk of graft loss within the 2 years after childbirth was not associated with mode of delivery. In addition, vaginal delivery was associated with lower rates of neonatal composite morbidity, even after adjusting for factors such as maternal comorbidities and gestational age at delivery. In kidney transplant recipients, a trial of labor—whether or not it ended in a successful vaginal delivery—was associated with a lower rate of neonatal composite morbidity compared with a scheduled cesarean delivery, and in liver transplant recipients, successful vaginal delivery was associated with a lower composite neonatal morbidity rate. These findings are consistent with data from general population-based studies demonstrating an association of cesarean delivery with increased rates of neonatal morbidity, primarily respiratory morbidity.⁶

In addition to showing favorable outcomes associated with vaginal delivery, Yin and colleagues⁵ evaluated indications for cesarean delivery in their cohort. In this study, the overall cesarean delivery rate was consistent with previously reported rates in transplant recipients, with cesarean delivery rates of 51.6% among kidney transplant recipients and 41.4% among liver transplant recipients. In both groups, 20% or more of scheduled cesarean deliveries were for elective indications, and in the kidney transplant group, the elective category was the most common indication for a scheduled cesarean delivery overall. Reasons for elective cesarean delivery were related to physician counseling, patient preference, and hospital policies, all of which are potentially modifiable by patient and physician education. Targeting patients who electively opt for cesarean delivery may have appreciable consequences for overall rates of cesarean delivery among transplant recipients. For example, if all women undergoing an elective scheduled cesarean delivery in this study had opted for a trial of labor with a 70% success rate, the overall rates of cesarean delivery would have decreased to 46% and 38% among kidney and liver transplant recipients, respectively. This

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reduction could be further magnified if one considers the added downstream effect of reducing the rate of scheduled repeated cesarean deliveries by elimination of that first cesarean delivery.

A source of anxiety for obstetric practitioners performing cesarean deliveries in transplant recipients has been the potential for encountering altered maternal anatomy. Several case reports of renal graft injury at the time of cesarean delivery have seemingly validated this concern.^{7,8} Of reassurance, Yin et al⁵ found that the rate of graft injury at the time of cesarean delivery was low (<1%), occurring in 5 of 919 pregnancies delivered by cesarean, with 2 during a scheduled cesarean delivery and 3 during a cesarean delivery in patients who had undergone trial of labor.

Of note, the data presented in the study by Yin and colleagues⁵ were derived from the Transplant Pregnancy Registry International, a voluntary registry of pregnancies after transplant, with data abstracted from medical record review and patient interviews; therefore, some of the data presented may be limited by recall bias, a factor acknowledged by the authors. In addition, the registry included transplant recipients who received obstetrical care in a variety of settings—both community hospitals and academic centers—and delivered neonates during a period of 5 decades. Therefore, for better or worse, the studied population was subject to varied medical practices during this half-century period.

An important aspect in caring for the gravid transplant recipient that this study did not address is the underlying disease process leading to transplant in the first place. It is not just the transplant itself or the medications the recipient is taking that affect obstetrical outcomes. The medical indication for the transplant may also be associated with the risk of maternal and neonatal morbidity and, frequently, with decision-making for mode of delivery, particularly for kidney transplant recipients. In their study, Yin and colleagues⁵ reported rates of hypertensive disease and pregestational diabetes, but it is unclear whether these were the reason for the organ transplant (ie, they are common sequelae of transplant and antirejection medications). Other disease processes such as autoimmune disease and genetic abnormalities, which are common indications for end-stage kidney disease in the US, were not reported. Transplant recipients represent a heterogeneous group; for instance, delivery planning and childbirth-associated morbidities are different for a kidney transplant recipient with polycystic kidney disease compared with a recipient with systemic lupus erythematosus, hypertension, and a history of thromboembolism owing to antiphospholipid syndrome. It would be valuable to assess the association of baseline comorbidities with obstetrical outcomes and mode of delivery in future studies.

In summary, the report by Yin and colleagues⁵ provides more credence to vaginal delivery as the preferred mode of delivery for solid-organ transplant recipients and to limiting the use of cesarean delivery to traditional obstetrical indications for the benefit of both mother and child. A trial of labor had a high rate of success in this population and was associated with lower composite morbidity among neonates without increasing maternal morbidity or compromising graft survival. These data may provide additional reassurance to transplant recipients and obstetric practitioners that vaginal delivery may be safe and may be the preferred route for childbirth in this patient population.

ARTICLE INFORMATION

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