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Breast-feeding after transplantation

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Transplantation affords recipients the potential for a full life and, for some, parenthood. Female transplant recipients must continue to take immunosuppression during pregnancy and breast-feeding. This article reviews case and series reports regarding breast-feeding in those taking transplant medications. Avoidance of breast-feeding has been the customary advice because of the potential adverse effects of immunosuppressive exposure on the infant. Subsequent studies have demonstrated that not all medication exposure translates to risk for the infant, that the exposure in utero is greater than via breast milk and that no lingering effects due to breast-feeding have been found to date in infants who were breast-fed while their mothers were taking prednisone, azathioprine, cyclosporine, and/or tacrolimus. Thus, except for those medications where clinical information is inadequate (mycophenolic acid products, sirolimus, everolimus, and belatacept), the recommendation for transplant recipients regarding breast-feeding has evolved into one that is cautiously optimistic.

Introduction

Breast-feeding and the use of human milk confer unique nutritional and non-nutritional benefits to the infant and the mother. The American Academy of Pediatrics (AAP) recommends exclusive breast-feeding for about 6 months, followed by continued breast-feeding as complementary foods are introduced, and continuation of breast-feeding for 1 year or longer as mutually desired by the mother and the infant [1]. In the past decade, there has been a modest increase in the rate of "any breast-feeding" at 3 and 6 months of age, and data from the National Transplantation Pregnancy Registry (NTPR) regarding breast-feeding among solid-organ transplant recipients mirror that increase [1–3].

Breast-feeding can benefit the infant by decreasing the risks of various infections, for example, otitis media, respiratory infections, gastrointestinal (GI) infections [4–8], early allergies [9], celiac disease [10], and childhood inflammatory bowel disease (IBD) [11], as well as improving neurodevelopmental outcomes [12,13]. Over the past two decades, the benefits of breast-feeding low-birth-weight and preterm infants have been demonstrated in controlled clinical trials in the general population [14–16]. The AAP has incorporated these findings into their guidelines, which state that the benefits are such that all preterm infants should receive human milk [1]. Feeding preterm infants breast milk is also associated with a decrease in the incidence of necrotizing enterocolitis, and it has been found that extremely preterm infants receiving the greatest proportion of human milk in the neonatal intensive care unit (NICU) had significantly greater scores for mental, motor, and behavior ratings at ages 18 and 30 months [17–19]. As low-birth-weight and preterm delivery can occur in 30–80% of live births in female transplant recipients depending on the transplanted organ [20], breast-feeding or administering human milk to these infants could be an effective therapeutic intervention. This potentially could reduce the risk of sepsis and necrotizing enterocolitis in the perinatal period, support growth, and improve neurodevelopment outcomes. Moreover, there are health benefits to the mothers who breast-feed, such as decreased postpartum blood loss, rapid involution of the uterus, and increased child spacing due to lactational amenorrhea [1].

The current AAP guidelines note that some drugs are not excreted into human milk in clinically significant amounts, and detecting the presence of a drug in human milk does not always imply a risk to the infant. It is recommended that physicians consider multiple factors when counseling those who must take medications while breast-feeding, including the need for the drug by the mother, the potential effects of the drug on milk production, the amount of the drug excreted into human milk, the extent of oral absorption by the breast-feeding infant, and the potential adverse effects on the breast-