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Sevoflurane Induced Cerebrovascular Dysfunction in Infant Offspring from Preeclamptic Pregnancies

Abstract

Preeclampsia (PE) is a devastating disorder of pregnancy that has long-term effects on the health of mothers and their offspring. Though PE is known to have significant long-term consequences for the mother and their offspring, little is known about how PE affects the structure and function of the cerebrovasculature in newborns. Because the newborns period is a critical time of brain development, it is particularly important to ensure adequate blood flow to the brain while newborns are anesthetized. Regulation of cerebral blood flow in newborns is known to be altered by general anesthesia, but the effect of general anesthesia on regulation of cerebral blood flow in newborn offspring of PE mothers has not been studied. The overall objective of this study is to determine the effect of PE on cerebrovascular function in newborn offspring anesthetized with sevoflurane. Our preliminary studies suggest that cerebrovascular structure and function is abnormal in offspring of PE pregnancies, suggesting that the combination of intrauterine exposure to PE and general anesthesia may put newborns at increased risk of inadequate blood flow to the brain during periods of low blood pressure when anesthetized. The results of this study will help anesthesiologists understand how intrauterine exposure to PE affects brain blood flow in newborn offspring undergoing general anesthesia, providing critical insight that will allow us to provide optimal anesthesia care for these vulnerable patients.