The Risk of General Anesthesia in the First 3 Years of Life

When I am asked about the risks for a child undergoing ophthalmic surgery, I describe the possible complications and unexpected outcomes. I also tell the caregivers that the risk of general anesthesia may be greater than the surgical risk, particularly in infants and young children. This includes both acute intraoperative events and long-term neurodevelopmental effects as described in Cavuoto et al.’s article in this issue. The authors remind us that in 2016 the U.S. Food and Drug Administration issued a warning that general anesthesia may affect brain development in children. This warning was based on the accumulating data from animal and human studies. These are summarized nicely by the authors. It is noteworthy that procedures lasting more than 3 hours and multiple procedures requiring separate anesthesia exposures are particularly concerning. Fortunately, most of our procedures last less than 3 hours, but many conditions that we treat require reoperations or multiple examinations under anesthesia. Therefore, our patients are at risk.

Animal studies have demonstrated higher rates of dysregulated neuronal apoptosis in animals exposed to some of the common agents used in general anesthesia procedures such as sevoflurane. There are conflicting results in laboratory studies on the neurotoxicity of anesthetic agents in humans. Prospective human studies have not demonstrated intelligence quotient differences in children exposed to anesthetic agents versus controls. However, the Mayo Safety in Kids study suggests a possible modest negative impact in executive functions such as verbal coding and reading skills in children with multiple anesthetic exposures prior to 3 years of age.

Currently, adjuvant therapies to mitigate the effects of anesthetic agents are being investigated. As ophthalmic surgeons, we should strive to minimize our operating time with skilled efficient surgery and perhaps look for alternatives to examinations under general anesthesia for our youngest patients.

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Editor