

EDITORIAL

Use of anaesthetics in young children

Consensus statement of the European Society of Anaesthesiology, the European Society of Paediatric Anaesthesiology, the European Association of Cardiothoracic Anaesthesiology and the European Safe Tots Anaesthesia Research Initiative

Tom G. Hansen

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Experimental studies have shown that general anaesthetics may cause a variety of morphological changes in the developing immature brain of laboratory animals.¹ In addition, there is some evidence that long-term and prolonged exposure may be worse than short-term exposure in some animal species.^{2,3} However, the relevance of these findings in human beings is currently unknown,^{4,5} and studies have shown controversial results.^{6–8} Although a number of investigations in humans have demonstrated an association between surgical and anaesthetic exposure and negative neurodevelopmental outcome,^{9–11} several others have been unable to find such an association or only in a minor subset of exposed children with or without extensive individual neurocognitive testing.^{12–18} It remains, therefore, very difficult to identify whether any negative neurodevelopmental effects are because of the anaesthetic drugs, the conduct of anaesthesia, surgical trauma or the underlying clinical conditions.^{3–19}

Importantly, however, two prospective human studies, with the most robust designs, indicate that short-term single exposure of 60 min or less to surgery and anaesthesia is not associated with measurable long-term neurodevelopmental problems.^{12,16}

Food and Drug Administration statement

On the 14th of December 2016, the Food and Drug Administration (FDA) issued a warning statement for

the United States of America regarding the use of anaesthesia or sedation in young children (and pregnant women).²⁰ This statement highlights potential risk of anaesthetic procedures that last longer than 3 h or multiple procedures required in children less than 3 years of age. The evidence to support such warning is currently insufficient and incomplete. Therefore, this FDA warning is not shared by the European Societies listed below.

The European Society of Anaesthesiology/ European Society of Paediatric Anaesthesiology/European Association of Cardiothoracic Anaesthesiology/European Safe Tots Anaesthesia Research Initiative consensus statement

No child or pregnant woman should ever undergo any medical procedure that is not necessary. Similarly, young children (and pregnant women) should not undergo surgery and general anaesthesia for trivial reasons. However, delaying or avoiding surgery may result in a significant and real risk of a variety of adverse outcomes. If an invasive procedure is necessary, adequate anaesthesia/analgesia are mandatory. Indeed, there is good evidence that inadequate anaesthesia and analgesia may result in significant and serious complications.^{21,22} There is currently no evidence to support the suggestion that a change from established techniques for prolonged or repeated procedures would have any impact on long-term outcomes including neurocognition and development in young children.

From the Department of Clinical Research – Anaesthesiology, University of Southern Denmark, Odense, Denmark

Correspondence to Tom G. Hansen, MD, co-Chair of European Safe Tots Anaesthesia Research Initiative, Department of Clinical Research – Anaesthesiology, University of Southern Denmark, Odense, Denmark
E-mail: tomghansen@dadlnet.dk

Furthermore, the implied 'safe' cut-off points of age 3 years or duration of procedure of 3h quoted in the FDA warning statement are not currently supported by evidence derived from human studies.

Given the uncertainty in this domain, it is reasonable to discuss all aspects of perioperative safety with patients, parents and families. However, discussion of hypothetical risks based primarily on animal research not confirmed in human studies may create anxiety.

Established well tolerated anaesthetic techniques delivered by trained and experienced staff in a paediatric environment supported by the necessary clinical organisation are essential factors for the delivery of well tolerated anaesthesia and sedation in children.²³

Conclusion

There is currently no compelling evidence to change anaesthetic practice, but anaesthesiologists should provide adequate information on the risks of avoiding a necessary intervention/anaesthesia procedure as well as on the potential risks associated with anaesthetic procedures. The European Societies listed above participate in international collaborations and support the principles of well tolerated conduct of anaesthesia in children and pregnant women. Information for parents and information for anaesthetists will be updated as and when new issues arise.

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