Pediatric Anesthesia

EDITORIAL

Use of anesthetics in young children Consensus statement of the European Society of Anaesthesiology (ESA), the European Society for Paediatric Anaesthesiology (ESPA), the European Association of Cardiothoracic Anaesthesiology (EACTA), and the European Safe Tots Anaesthesia Research Initiative (EuroSTAR)

Background

Experimental studies have shown that general anesthetics may cause a variety of morphological changes in developing immature brain of laboratory animals (1). Additionally, 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). While a number of investigations in humans have demonstrated an association between surgical and anesthetic 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 due to anesthetic drugs, the conduct of anesthesia, surgical trauma or the underlying clinical conditions(s) (3–19).

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

FDA statement

On December 14, 2016, the Food and Drug Administration (FDA) issued a warning statement for the USA regarding the use of anesthesia or sedation in young children (and pregnant women) (20). This statement highlights potential risk of anesthetic 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 ESA/ESPA/EACTA/EuroSTAR 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 anesthesia 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 anesthesia/analgesia are mandatory. Indeed, there is good evidence that inadequate anesthesia 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.

Furthermore, the implied 'safe' cut-off points of age 3 years or duration of procedure of 3 h 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 safe anesthetic techniques delivered by trained and experienced staff in a pediatric environment supported by the necessary clinical organization are essential factors for the delivery of safe anesthesia and sedation in children (23).

Conclusion

There is currently no compelling evidence to change anesthetic practice but anesthesiologists should provide

This article has been co-published in *European Journal of Anaesthesiology* by agreement with Wolters Kluwer
Pediatric Anesthesia **27** (2017) 558–559

adequate information on the risks of avoiding a necessary intervention/anesthesia procedure as well as on the potential risks associated with anesthetic procedures. The European Societies listed above participate in international collaborations and support the principles of safe conduct of anesthesia in children and pregnant women. Information for parents and information for anesthetists will be updated as and when new issues arise.

Acknowledgment

None.

Financial support and sponsorship

The study received no external funding.

Conflicts of interest

The authors report no conflict of interest.

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doi:10.1111/pan.13160

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