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Kids exposed to general anaesthestic have poorer development, literacy and numeracy scores: study

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The new finding published today in *Pediatric Anesthesia*, is based on a data-linkage study of over 210,000 children in New South Wales, Australia.

The 211,978 children included in the study were born in New South Wales at 37-plus weeks' gestation without major congenital anomalies or neurodevelopmental disability. Of these, researchers had data on their school entry developmental assessment in 2009, 2012, or their Grade-3 school test results in 2008-2014.

The researchers compared the developmental and school results of children exposed to general anaesthesia during hospital procedures (37,880) up to 48 months of age to same-aged children with no exposure to general anaesthesia or hospitalisation (197,301).

Key findings

Compared to children unexposed to general anaesthesia, those exposed to general anaesthesia had a:

- 17 per cent increased risk of poor child development
- 34 per cent increased risk of lower numeracy scores on school tests
- 23 per cent increased risk of lower reading scores on school tests.

When the researchers restricted their analyses to children who'd had only one hospitalisation involving a procedure requiring general anaesthesia, they found no increased risk for poor development or reduced reading scores, however the risk of poor numeracy scores remained.

"There are many reasons why a child requires surgery or investigation, and, in some cases, this may be lifesaving or unavoidable," said the study's senior author, Professor Natasha Nassar of the University of Sydney.

"For these children, our findings suggest that it is important to follow-up and monitor their literacy and numeracy skills when they reach school, and ensure early intervention, if required."

Co-author Dr Justin Skowno, a clinical lecturer at the University of Sydney and senior staff specialist in Paediatric Anaesthesia at the Children's Hospital, Westmead said:

"Determining exactly what is causing this effect is not easy.

"The children receiving a general anaesthetic in this study also had surgery, and often had other associated medical conditions.

"There are some procedures where alternative approaches or management may be possible, but the majority of surgeries in young infants and children cannot easily be postponed."

"Parents can certainly discuss with their doctor and explore whether these procedures can be avoided, combined with other procedures, delayed to older ages or treated with alternatives to surgery, or other methods of sedation," said Dr Skowno.

The researchers say further investigation of the specific effects of

general anaesthesia on numeracy skills, underlying health conditions that prompt the need for surgery or diagnostic procedures is required, particularly among children exposed to previous or long duration of general anaesthesia or with repeated hospitalisations.

Measures of development, literacy and numeracy

Child development was obtained from the Australian version of the Early Development Instrument (AvEDI), a nationwide triennial assessment of child development. It includes results from teachers' assessment of five developmental domains: physical health and well-being, emotional maturity, communication skills and general knowledge, language, and cognitive skills (numeracy and literacy) and social competence.

Based on national percentiles, children with domain scores in the bottom 10 percent are classified as developmentally vulnerable in that domain. Children who are vulnerable in 2 or more domains are classified as developmentally high risk.

Provided by University of Sydney

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