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Brief exposure to general anaesthesia is safe for young children: study

Landmark international research into the effect of anaesthesia on young children led by Melbourne anaesthetist and clinical researcher Professor Andrew Davidson has found that general anaesthesia is unlikely to have lasting effects on the developing brain.

The results of the General Anaesthesia compared to Spinal Anaesthesia (GAS) trial published in *The Lancet* on Friday, February 15 (AEST) concludes that one brief general anaesthetic in early childhood is unlikely to be harmful to long-term neurodevelopment but the safety of longer exposures remains unclear.

Professor Andrew Davidson, Head of Anaesthesia Research and Medical Director of the Melbourne Children's Trials Centre, at the Murdoch Children's Research Institute and Royal Children's Hospital led an international group of paediatric anaesthetists and other specialists for the study which is the first randomised trial to examine whether exposure to general anaesthesia in infancy affects the growing brain.

The Australian and New Zealand College of Anaesthetists (ANZCA) jointly funded the GAS trial with the Australian National Health and Medical Research Council (NHMRC), the Murdoch Children's Research Institute and leading international bodies and research groups including the Health Technologies Assessment-National Institute for Health Research UK and the Canadian Institutes of Health Research.

The trial involved researchers and doctors at 28 hospitals in Australia, New Zealand, the US, Canada and Europe between February 2007 and January 2013. The trial tested the neurobehavioural and cognitive development of more than 700 infants who underwent hernia surgery (one of the most common operations of early childhood) at two years of age and then at five years. The children were allocated either a general anaesthetic or a regional (local) anaesthetic.

"The trial provides the strongest evidence to date that one hour exposure to anaesthesia is safe in young children," Professor Davidson said.

"Nearly half the general anaesthetics given to infants are used for less than one hour, therefore our findings should reassure health professionals and the millions of parents whose young children undergo surgical or diagnostic procedures with anaesthetic drugs worldwide every year.

Professor Davidson said the findings meant children no longer needed to be subjected to the potential medical and developmental risks of delaying surgery, and anaesthetists did not have to avoid general anaesthetics in favour of less well established anaesthetic techniques.

The Lancet 2019 paper reports the final results of the GAS trial at five years of age after child psychologists assessed children's IQ scores and other cognitive measures such as memory and attention.

It follows interim 2016 GAS results which found that neurodevelopmental outcomes at 2 years of age did not significantly differ between the children who were given general anaesthesia and regional anaesthesia.

Millions of young children have an anaesthetic around the world each year for a range of surgical, medical and diagnostic procedures. In Australia alone, more than 70,000 children under four years of age have an anaesthetic each year.

The Lancet paper reports that the results showed no significant difference in IQ scores between the children exposed to general anaesthesia (average IQ score 98.87) and regional anaesthesia (99.08), after adjusting for age at birth and country, and accounting missing data. There were also no differences in a range of other tests of neurobehavioural and cognitive function.

The report's authors noted that 84 per cent of the study participants were male and said more research was needed to confirm the findings in girls and children with prolonged exposure to anaesthesia.

For more information or to request interviews please contact ANZCA Media Manager Carolyn Jones on +61 408 259 369 or cjones@anzca.edu.au. Follow us on twitter @ANZCA.