Anaesthesia and Neurotoxicity – PACSA position statement for Parents.

PACSA
PAEDIATRIC ANAESTHESIA COMMUNITY OF SOUTH AFRICA

As paediatric anaesthetists we often get asked, “Will this anaesthetic cause damage to my child’s brain”? Children’s brains are continually developing and changing in response to the environment in which they find themselves; surely it is imperative to know whether the medications we give could alter the way in which children perceive and interact with that environment? Unfortunately there is no simple answer.

The controversy arose when studies showed that giving anaesthesia to baby rats and primates caused damage to some nerve cells in the brain, affecting their development and causing difficulties with learning and memory.

Why can we not extrapolate these results to human babies and children?

First, despite how you may sometimes feel, children are not animals. Their brains don’t grow at the same rate or in comparable stages of development as a rat’s, and the mechanisms they have to repair themselves are different.

Second, the anaesthetics these newborn rats and monkeys received were not comparable with the anaesthetic your child will receive. The doses of medicines used in the studies were far larger and the duration of exposure far longer (by multiples) than those used in clinical practice. The type of monitoring and anaesthetic care was also nowhere near the level of the care your child receives during surgery.

So the animal studies, while raising concern, needed to be taken a little further.

All the human studies done up until now have been what is called “retrospective”, i.e. have looked backwards at patient files and educational records to try to see if there is a link between anaesthesia and learning or emotional difficulties later in life. So far, they have been able to show an ASSOCIATION between receiving anaesthesia, particularly for numerous procedures, and learning or emotional difficulties later on, but no study has been able to show that the anaesthetic CAUSES these problems. This may be because children coming for numerous surgeries are likely to have underlying problems that could predispose them to learning or emotional difficulties, like being born prematurely, having a congenital heart defect, having a longterm illness like cancer or kidney disease, or having poor hearing that requires grommets. (i.e. the anaesthetic may well just be a marker for illness or a problem requiring surgery)

Newer studies have been designed specifically with this question in mind. While they are still underway, their early results show that there is no difference in cognitive ability between a child who has an anaesthetic as a baby and their twin sibling who didn’t. Reassuring indeed!

Where does this leave us, both as parents and as paediatric anaesthetists?

- There is no recommendation to delay surgery unnecessarily, and it may indeed be dangerous to do so. We would not perform surgery and give anaesthesia if it wasn’t absolutely necessary.
- Where more than one procedure is required, it may be worth doing these in one sitting if that is appropriate and feasible.
- Surgery without anaesthesia and pain relief is both unimaginable and unethical.

A well conducted anaesthetic with all the appropriate monitoring, conducted by a well-trained anaesthetist, experienced in paediatric anaesthesia, is the best way to mitigate against these currently unknown risks.

Should you require any further information or have any other questions around this important issue, please feel free to speak to your anaesthetist.

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