An Audit of Patterns of Inhalational Anesthetic Use During Pediatric Anesthesia.

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The significant environmental impact of healthcare is now well recognised. The global warming potential of inhalational anesthetic agents is a small but significant part of this footprint. Our department has a long interest in rationalising inhalational anaesthetic agent use. We have previously observed that short pediatric cases with inhalational induction can use more than 2.5 times the amount of sevoflurane used in long complex adult cases utilising intravenous induction (1). In 2019 we collected data on volatile anesthetic use in paediatric practice in our hospital (2). The aims of the current audit were to look at agent use, including N_2O, during induction and maintenance and explore the effect on consumption of using a separate machine in the anesthetic bay for induction.

Methods: Study approved by the New Zealand Ethics Committee. We recorded patient demographics, and the consumption of inhaled anaesthetics from anesthetic machine logs, during induction and maintenance in patients aged under 13 yr. This was an opportunistic sample based on the days one of us (AM) was available for this task during Jan-Mar 2021. Christchurch Hospital is a 600 bed tertiary hospital with 3 (of 30) OR dedicated to pediatric procedures. All our OR machines are GE Aysis with end-tidal control. Anesthetic bays of the paediatric OR have GE Avance machines.

Results: 205 cases were available for analysis. 167 (81%) had inhalational inductions, 130 (63% of the total) of these were maintained on sevoflurane while 37 (18%) were transitioned onto TIVA for maintenance which was used for 55 (27%) patients. Volatile anaesthetics used a median of 20mLs sevoflurane (IQR 16-29.25) and 12.41 L of N_2O (IQR 8.3-19.9). If the patient was transitioned onto IV maintenance after inhalational induction, sevoflurane consumption was 10mLs (IQR 8-13). There was no difference between the amount of sevoflurane or N_2O used when the patient was induced in the anaesthetic room, compared to induction in theatre. N_2O was not used for maintenance in any cases.

Conclusions: This study reiterates that about half of agent consumption occurs during induction. Induction and maintenance each account for an average of about 10ml of sevoflurane, similar to our data from 2019. Surprisingly we found that use of a separate machine for induction in the anesthetic bay did not increase total consumption. We speculate that automated low flow anesthesia was initiated as soon as the patient was connected to the OR Aysis. At the time of this audit our TIVA rate across all patent groups was 50% compared to 27% TIVA maintenance in this group.
Our data further quantifies sevoflurane and N_2O use during paediatric anaesthesia in our hospital and has helped identify strategies for decreasing inhalational use in this group.

REFERENCES:
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