INTRODUCTION

The safety of general anesthetics and the potential for long term neurological dysfunction in young children is an active area of current research. We previously reported that 2hrs of anesthesia prior to 2yrs of age lead to a deficit in recognition memory in children tested at 6-11yrs of age. We hypothesized that both age at the time of exposure and duration of exposure are important variables leading to deficits in recognition memory. Our current study hopes to help elucidate whether the length of anesthetic or the age at the time of exposure correlate with later neurocognitive dysfunction.

METHODS

Potential subjects at 3 institutions were identified based on age at time of service, current age, procedure, and anesthetic duration. Records were then obtained for further review of inclusion and exclusion criteria. Inclusion: patient meets one of 3 group parameters listed below in addition to volatile based anesthetic and current age 6-11.

- ASA 3 or greater
- Emergency Cases
- Prematurity
- Pre-existing Neurological Disease
- Cancer
- Known Genetic Syndromes
- Intraoperative Physiologic Derangements
- Anesthetics Outside of Study Window

Exclusion criteria are listed below.

- ASA 3 or greater
- Emergency Cases
- Prematurity
- Pre-existing Neurological Disease
- Cancer
- Known Genetic Syndromes
- Intraoperative Physiologic Derangements
- Anesthetics Outside of Study Window

RESULTS

The anesthetic records for 5868 patients have been reviewed. 1719 met inclusion criteria. 103 eligible patients and controls have been tested to date. Of the 103 eligible participants, 14 had early, short exposures (<30 MAC minutes), 33 had early, long exposures (>120 MAC minutes), 32 had late, long exposures (>120 MAC minutes), and 24 are controls. ENT cases (including dental work) were the most common surgical type in our sample (46%) followed by general surgery cases (18%) and urological procedures (16%). Initial analysis of WASI scores reveals a significant difference in verbal comprehension (VCI) and functional IQ scores of English learners compared to native English speakers regardless of anesthetic exposure. There was no statistically significant difference in perceptual reasoning scores. (PRI)

CONCLUSIONS

This project has identified and tested 103 6-11yr old otherwise healthy subjects divided among controls, early short exposure, early long exposure and later long exposure. As further patients are enrolled and evaluated, sub group analysis can be performed, in hopes of better understanding the age and duration effect of anesthesia on recognition memory and IQ. This interim analysis identified lower verbal comprehension and functional IQ scores among English learners as a potentially confounding variable when attempting to find associations between anesthetic exposure and learning deficits in our sample.