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EFFECT OF CAUDAL ANALGESIA ON AROUSAL IN CHILDREN AFTER ANESTHESIA WITH SEVOFLURANE AND HALOTHANE

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Abstract:

These risk factors for terminal renal failure in patients suffering from hypertension were studied. In patients before the development of end-stage renal failure, the content of urea and creatinine was studied. When examining the outpatient card of patients before the development of terminal renal failure, it was found that in some patients, starting from 7 years after suffering hypertension, an increase in the content of urea from 9.2 to 12.1 mmol / l and creatinine from 0.189-0.237 mmol / l in the blood was observed sick.

Keywords: Hypertension, end-stage renal failure, urea, creatinine, indican, cystatin

INTRODUCTION:

Sevoflurane is often used to induce anesthesia in pediatric patients due to mask induction with sevoflurane it is faster [1-5] and produces fewer cardiovascular depressions [1,3-8] and fewer arrhythmias [1,3, 5,9] than halothane. sevoflurane, also provides an effect when used as a maintenance anesthetic aspect faster than halothane [2, 3, 8, 10-14]. It appears that in young children recovering from sevoflurane anesthesia, the incidence of arousal is greater than with halothane [2, 8, 15-19]. This unfavorable property has been attributed to speed aspect [2,8,15], intrinsic stimulating property of the drug [20, 21] and inadequate postoperative analgesia [10, 22-23]. Postoperative use pain at the onset of restlessness after inhalation anesthesia is unclear, as many studies may have failed to ensure adequate postoperative pain control. Pain, is one has been identified as a cause of postoperative stress and anxiety in children and may complicate assessment Eastern Hustle. That's why we designed the studio to compare post-climb hit rates Anesthesia with halothane and sevoflurane in children Consequently, they were known to have complete analgesia Tail block. We also assessed preoperative behavior to determine the impact of preoperative anxiety about post-surgery restlessness

METHODS

Eighty physical ASA stage I children underwent surgery for an inguinal hernia in Al Karama Teaching Hospital and in medical city, Baghdad Iraq from May 2021 to December 2021. people were registered and parental informed consent was obtained. The exclusion criteria included urgency treatments, medical contraindications for accommodation caudal lock, intellectual disability, developmental delay, attention deficit, hyperactivity disorder, mental illness, history of paradoxical agitation with Sedatives or a previous Ascension episode of delirium. Children received premedication with oral midazolam 0.5 mg/kg mixed with an ibuprofen suspension (10 mg/kg). Twenty to 30 minutes after receipt of tranquilizers, were separated from their parents and were taken to the operating room. Children were assigned to mask induction with halothane or sevoflurane in a mixture of 70% nitrous oxide and 30% oxygen with a fresh-gas flow of 10 L/min. After Anesthesia induction, IV cannula, tail block, a laryngeal mask (LMA) airways were inserted. The caudal block was done using sterile technology to administer 1mL/kg equal volumes of 0.25% bupivacaine with adrenaline 1:200,000 and lidocaine 1% with adrenaline 1:200,000. Was allowed to breathe spontaneously while under anesthesia. After entering the LMA, the nitrous oxide concentration in the oxygen concentration dropped to 60% and the total fresh gas flow was reduced to 5 L/min. Standard general anesthesia was administered in both groups, with inhaled end-tidal concentrations adjusted to ensure a minimum alveolar anesthetic (MAC) concentration of 1. Effects of Age and Nitrous Oxide MAC of halothane and sevoflurane in various degrees [24,25]; then adjusted for age/nitrogen, each child received a MAC level of anesthesia before the surgical incision and throughout the procedure. The skin incision served as a test for the analgesic suitability of the caudal lock. The block was considered insufficient when the child's heart rate increased by 20%. Within 60 seconds of skin incision. Only children were judged with continued function block study. They do not receive intraoperative analgesics or other sedatives, and her

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age/nitrogen-adjusted inhaled anesthetic MAC rapidly reduced by 50%. Children who had a pulse response to the skin incision received intravenous opioid analgesia and were not evaluated for restlessness or low back pain Post Anesthetic Care Unit (USPA).

At the beginning of the surgical closure (simultaneously with the closure of the bilateral hernias), the inhalation anesthesia was terminated. nitrous oxide and oxygen abandoned the flow rate of the has been increased to 10 l/min after winding the closure is completed, the LMA was abolished OR if two of the following conditions occur In the following occurred: eye-opening, vocalization, grimacing, swallowing, biting, coughing, gagging, spontaneously turning the head or raising the hands to the face. The babies were then transported to the rehabilitation center and tested to ensure they had a working caudal Block. Children with lower extremity weakness, e.g. The subjects who did not respond to toe clipping, were assumed to be suffering from toe clipping working block

Behavior was assessed at this point during the Ambulatory Surgical Unit (ASU) admissions process on the separation of parents, at the implementation of anesthesia mask and in the recovery room by a trained observer blind to the inhalation anesthesia group. The following point systems were used: 1. Yale Preoperative Anxiety Scale (YPAS) [(26)] was used for all subjects. YPA extension measures anxiety-related behavior in 5 domains, giving an overall raw score of 5 (least afraid) to 21 (most afraid). The YPAS score was been assigned as preoperative nurse vital signs of a child. 2. The Separation Scale [(27)] was used to assess parental separation behavior 1=Perfect [separates easily]; 2= good [don't make a fuss, moan, calm down]; only 3= [does not flail, does not cry, does not calm down, does not calm down]; and 4= poor [crying, clinging to a relative]). Separation points 1 or 2 were rated as satisfactory, considering a score of 3 or 4 unsatisfactory. 3. The induction scale [(27)] was used to rate the acceptability of the anesthesia mask ,1= excellent [do not fear, cooperate, accepts the mask readily]; 2= good [slight masked anxiety, calms easily]; only 3= [moderate anxiety not relieved by sedatives]; 4 =poor [anxious, crying, excited]). induction points 1 or 2 were rated as satisfactory, considering a score of 3 or 4 unsatisfactory. 4. An ascending stimulation scale was measured Entry PACU, then every 5 minutes, and after the parent's arrival at PACU 1= attentive and calm, willing to cooperate; 2= crying, needs comforting; 3= irritable/anxious, screaming, heartbroken; 4= militant, confused, rounds.

Children with an arousal score of 3 or 4 were classified as restless. Albeit surprising, mixing at 5-minute intervals may not be ideal, e.g. The busy environment of our pediatric intensive care unit was the fastest and most convenient way. Parents met with their children, USPA after initial hospitalization and stabilization stage. However, the children were considered very restless, had an excitement rating that stayed at 3 to 5 minutes after arrival of parents. Very agitated children were treated with morphine at a dose of 0.05 mg/kg Midazolam 0.05 mg/kg IV All children were examined to agitation 30 minutes after transfer from the recovery ward an ASU and shortly before release by ASU. On the second day after the intervention, parents received a short questionnaire to fill out the Child's Recovery and Parents' Satisfaction with perioperative experiences. Parents who have not returned of their questionnaires were contacted in one week by Telephone.

The duration of anesthesia was defined as time from the introduction of the masks to their abolition of inhalation anesthetic. The recovery time is specified as the time between discontinuation of the volatile anesthetic and removal of the AML. The engraving time was defined as the time from mask application to skin incision. Set the time to set queue lock as the time between the end of the block and the skin incision. The sample size for this study was designed accordingly spawn rate difference score Restlessness during the stay in the recovery room in the case of admitted children in Anesthesia with sevoflurane or halothane. Aono et al. (15) reported that the episodes of delirium in recovery in

preschool children after sevoflurane anesthesia were 40% but it was 10% in those anesthetized with halothane. We compute that a sample size of 36 patient per group would have at least an 80% power to detect a difference of 30% in the incidence of agitation during recovery. A P value of 0.05 was used for statistical significance.

We have estimated that 10% of children may have unclear caudal analgesia at skin incision, i.e. 80 children, were included in this study. Unless otherwise specified, data is presented as follows: mean +/-SD. Continuous data were analyzed with t-test for unpaired student. Nominal data were analyzed using Fisher's test. Maximum hit points each for two studies groups were compared using the Wilcoxon Ordered Sum Test (Mann-Whitney) for two samples. All statistical tests were bilateral

RESULTS:

Informed parents' obtained consent, 80 children were assigned to anesthetized with halothane, sevoflurane randomly, but only 68 were included in the study. No children were excluded because of a history of emergence agitation. However, 12 children (6 in the halothane group and 6 in the sevoflurane group) who were excluded from the study demonstrated a heart rate response to skin incision. Nine of the 12 were found to have functioning caudal blocks when they were examined later in the PACU. These children had similar PACU and ASU times compared with the children with

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functioning blocks who were kept in the study and did not require pharmacologic treatment for agitation. Two of the nine (both in the halothane group) were given morphine by the PACU nurses for apparent pain. (Table 1). To facilitate separation from parents e The induction quality of the mask was also similar in groups (Table 2). The total duration of the anesthesia, e.g. percent of the time it took to build the caudal block and emergence time between groups, was no different (Table 2). There were also no differences between the groups with regard to the elapsed time. before parents bring their children to PACU (May 14 +/- 6 minutes for the halothane group versus 12 +/-5 minutes for sevoflurane group; P =0.14). There was no difference in the rate of arousal between sevoflurane (24%) and halothane (12%) (p=0.2) upon admission to the PACU (Fig.1). Five minutes later children under sevoflurane the group experienced more agitation (27%) than the those with halothane group (5%) (P=0.05) (Fig. 1). THE maximum arousal points for the sevoflurane group were higher than those of the halothane group before arrivals of parents in the recovery ward (P < 0.03), but there were similar after parents arrived in intensive care unit. Agitated children in PACU were younger than calm children (27 +/-16 months versus 44 +/-20 months ;P 0.009). Six children (18%) in the sevoflurane group developed severe agitation requiring drug treatment compared to one child (3%) in the halothane group (P 0.11). Administration Midazolam and morphine were effective for termination of agitation immediately, but caused an extended stays at PACU for these children (41 +\-12 mins)VS (24+/-7 minutes; P0.001).

children with a history of surgery YPAS points are similar to those that children achieve interventions for the first time (8.6+/- 2.9)in the previous Operation vs(9.0 +/-3.4) without prior surgery; (P=0.68). The preoperative YPAS scores were highest in

1).children who had an unsatisfactory mask induction(11.1+/-4) versus (8.6+/-3); (P =0,047);

2)Agitated children at the time of admission to the ICU(10.8+/-4) versus (8.4+/-3); (p=0.02); and

3) children who developed the strong excitement that was needed drug treatments (11.3+/- 4 vs. 8.6 +/-3) (P=0.038). There was also no association between poor induction and strong ascending stimulation .if there was no correlation between the method of induction and postoperative restlessness. There were no differences between the study groups in terms of parental satisfaction ,perioperative experiences or behavioral

Data are mean+ sd unless otherwise stated. YPAS = Yale Preoperative Anxiety Scale.

ketorolac administration decreased excitation rate in halothane groups.

The authors concluded that inadequate analgesia was the main factor in the development of arousal [22] . A changes of the Children within the first 48 hours after surgery .

DISCUSSION

This study shows that sevoflurane is bound with an early and short-lived rise in incidence emergence restlessness against halothane if Reliable postoperative pain control is ensured by: caudal block. This finding supports the idea that Inadequate postoperative pain control may have contributed to the large differences in arousal between the two drugs reported in other studies[2,8,15-18]. Our study also suggests higher values Preoperative anxiety is associated with increased restlessness in young children. Some researchers found no difference in arousal restlessness between the two halothane and sevoflurane [22, 23-28] .

Bennato et al. [28] compared the appearance characteristics of halothane, sevoflurane and desflurane in the population Children aged 1 to 7 years after adenoidectomy and bilateral myringotomy and tubes (BMT). The children were premedicated with oral midazolam and no intraoperative analgesics sevoflurane .and Halothane All groups had significantly less postoperative restlessness compared to desaturate, which was the fastest spawn times [28]. These results suggest, so emergence speed can play a role in an emergence restlessness. Davis et al.(22) compared Halothane Anesthesia with sevoflurane anesthesia for BMT Delivery in Miners children. The researcher Especially address the role of pain in postoperative arousal by intraoperative administration of ketorolac or placebo to both anesthetic groups. All children received preoperative measurements intranasal midazolam. However, there was no difference in recovery from wakefulness between the types of anesthesia In these group

Table 1. Patient Demographics

Variable	Halothane (n =34)	Sevoflurane (n = 34)	P value
Age (mo)	43.8 +/- 21.7	37.6 +/- 18.8	0.21
Weight (kg)	15.1 +/- 4.3	14.7 +/- 4.0	0.69
Sex (M/F)	25/9	30/4	0.12
Previous surgery (%)	18	35	0.09
Preoperative YPAS	8.6+\-3.2	9.0 +/- 3.3	0.63

similar study showed that intranasal intraoperative fentanyl Improvement in restlessness and pain scores in children afterward Placement of BMT [23] . All children received oral midazolam before surgery, and there was no difference in stimulation between halo thane and [23] . In the above studies [22,23,28] it was taken orally Midazolam as a preoperative sedative: This is a factor

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could have contributed to the birth of his subjects. We used oral premedication with midazolam, because that was the standard of care in our hospital at times of our study and because we believed it will reduce children's fears over time separation and induction. Our goal was to avoid stormy induction that has been proven to contribute to arousal restlessness (29, 30). There are conflicting data on the effect of midazolam premedication on behavior in young children after surgery. Latino et al. (17) found that premedication with midazolam significantly reduced the incidence of Restlessness from sevoflurane but not from halothane anesthesia. This has been demonstrated by other researchers Midazolam slows the development of affected children However, does not appear to affect the occurrence of restlessness (31). We found no difference in spawning rate between the sevoflurane and halothane groups. However, all of our patients were premedicated with midazolam, and it is possible that residual sedation occurs slowed the emergence of the sevoflurane group. The combination of midazolam premedication and effective postoperative analgesia rather than analgesia alone may explain similar rates of arousal Across study groups Although this is a limitation of our study design, we were confident that this was the case It is unethical to refuse preoperative sedation in this case Population patients .

Table 2. Perioperative Anesthetic and Emergence Variables

Variable	Halothane	Sevoflurane	P value
Induction score (% satisfactory)	88%	91%	0.69
Separation score (% satisfactory)	100%	97%	0.99
Incision time (min)	17.3 +/- 2.8	17.0 +/- 1.9	0.68
Caudal block setup time (min)	11.4 +/- 2.1	11.7 +/-1.6	0.55
Anesthetic duration (min)	39.4 +/- 12.0	40.7 2+/- 5.1	0.78
Surgery duration (min)	22.6 +/- 11.3	23.6 +/- 24.7	0.81
Emergence time (min)	9.2 +/- 2.8	8.3 +/- 2.5	0.18

Previous studies have shown that restlessness is more common during recovery on sevoflurane than on halothane [2, 8, 15, 19]. These studies are difficult to compare due to different methods. Children undergoing various procedures [2.16] Myringotomy needle placement [17.18] and inguinal or urological surgery [8,15] - reported increased agitation due to sevoflurane. Preoperative sedation has not been widely used. An attempt was made to measure preoperative anxiety,, and the behavior of the subjects during induction was not documented. Postoperative pain was usually controlled were included in these studies, but it was unclear whether the analgesic regimen used was effective of all tested articles. Cravero et al. [19] avoided the problem of inadequate postoperative pain control screens children who require anesthesia for painless neuroimaging studies. The authors concluded that sevoflurane was associated with more frequent events of Awakening of Halothane. However, the study design did not include preoperative sedation [19]. We have chosen a remedy for severe and incessant restlessness to minimize child injury and reduce parent anxiety and general disruption of the PACU environment. It was needed with more children in the sevoflurane group and may shorten the duration of action in their restlessness. There was no midazolam or morphine served (15-20) minutes in PACU persisted and would therefore have no impact on incidence of awakening before parents go to bed. Sedatives can afflict the most troubled children has helped reduce the occurrence of restlessness in the sevoflurane group 10 minutes after the parent arrival time (Fig. 1). The agitation value was has been addressed in different ways by previous researchers. This was determined by the fact that there are no universally accepted scales of stress, agitation, or delirium in children. For the use of subjective evaluation methods [2,8,17] and various arousal rating systems [15, 16, 18, 19]. We created an arousal scale based on our stretch Observations of children waking up from anesthesia and over the works of others [32:33]. Our restlessness the scale is that of Aono et al. used very similar. [15]. We tried to ensure that the children in the two study groups had similar baseline levels of anxiety, to measure their YPAS score before serving midazolam. The fact that both study groups had similar baseline YPAS levels may also help explain this because we found fewer differences in arousal between groups. Worrisome behavior in children without premedication during induction may be a predictor of postoperative arousal [29, 30]. We found no differences in separation or

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induction results among the study groups, but higher before surgery YPAS points were associated with a difficult mask Induction, regardless of the inhalation anesthetic used.

A possible limitation of our study was our use of the original YPAS instrument for ages 12 months and 2 years in preoperative breeding Field . YPAS has not been validated in children of 24 months and was originally developed as a measure Anxiety in children undergoing anesthesia induction [(26)].

Kaina et al. [(34)] Subsequently modified YPAS (mYPAS) and showed that it can serve as a practical measure of children's fear of separation from their parents and the induction of anesthesia. At that time we did not have access to mYPAS at time of designed and built the study, then we used it original YPAS to measure fear before surgery. That is it's worth noting that we found higher values (higher anxiety levels) were on the original YPAS related to difficult mask induction, increased cases of restlessness on intensive care admission and more severe episodes of sudden agitation. Then following mYPAS study measuring baseline anxiety as predictor of emerging behavior in young children seems reasonable.

CONCLUSION:

our results suggest that sevoflurane is associated with a short period of wakefulness in young children. These results also indicate this the combination of premedication with midazolam and effective postoperative analgesia minimizes occurrence of restlessness after sevoflurane anesthesia. Over and beyond, YPAS scores in the early preoperative period can be helpful in identifying at-risk children to develop postoperative restlessness.

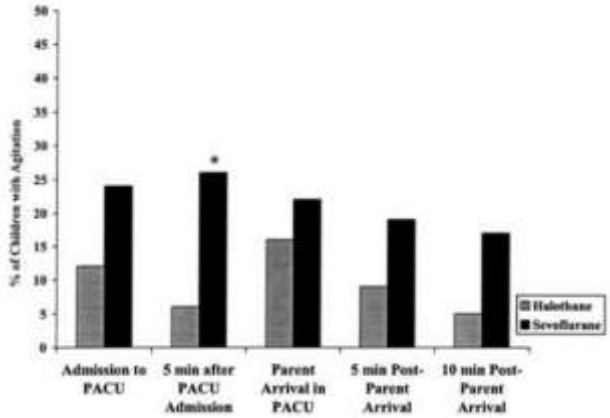

Figure 1. Percentage of children with agitation on admission to the
Post anesthesia care unit (PACU), 5 min after PACU admission, on
parent arrival in the PACU, 5 min after parent arrival, and 10 min
after parent arrival. *P 005

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