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REDUCING ANXIETY IN PARENTS BEFORE AND DURING PEDIATRIC ANESTHESIA INDUCTION

Introduction

The operative experience can be frightening, not only for children but also for parents. Many hospitals are implementing programs that include parental presence during the induction and recovery phases of their child's surgery. During induction of anesthesia, a parent's presence may result in a significant decrease in the number of upset or agitated children.¹ Their presence also is effective for relieving anxiety, thereby reducing the need for premedication.¹ Studies suggest that younger children, children previously anesthetized, and children who experience turbulent anesthetic induction are at increased risk for postoperative behavioral disturbances.² However, children who are less anxious during the perioperative period not only exhibit fewer behavioral problems postoperatively, but they also may face subsequent medical care more easily.^{3,4} Traditionally, premedication was prescribed for children undergoing surgery to avoid the disturbance and physical resistance related to parental separation. The increase in outpatient surgical facilities has necessitated a decrease in recovery time spent in the hospital and permits earlier discharge, thereby decreasing the use of long-acting premedications.

Although the presence of a parent in the preoperative holding area eliminates some of the separation anxiety of the child, a child's level of anxiety is correlated positively with the parent's level of anxiety.² The parent's anxiety is then critical to the anxiety the child experiences when entering the operating room for anesthetic induction.^{2,5} Children have more positive outcomes, such as smoother anesthesia induction,

decreased need for preoperative and postoperative analgesia, and decreased recovery time when their family members are present during anesthetic induction, and parental satisfaction is increased as well.^{1,3} Parental temperament may have a role in the benefit to the child of parental presence during induction. Research has shown that children with parents who have a low trait anxiety have significantly lower cortisol levels during induction of anesthesia than those with parents who are more anxious in general.⁶ Whether decreasing the parent's anxiety further would positively affect a child's level of anxiety requires further research. Because many hospitals use parental presence during anesthetic induction and postanesthetic care for children,⁷ and a majority of parents surveyed desire being present at their child's induction,⁸ parental anxiety levels must be addressed.

However, few studies have focused on the reduction of parental anxiety and how this relates to reducing the child's anxiety. The effect of parental presence on parental anxiety during the child's anesthesia induction was examined in an experimental study using the State-Trait Anxiety Inventory (STAI) as a measure of anxiety level.⁹ No significant differences in parental anxiety were observed between parents attending induction and recovery and those not attending. Although parental anxiety at the time of recovery was shown to be similar among the groups, the effect of decreasing the parent's anxiety on the child's outcome was not examined. This implies that regardless of whether a parent is present during induction, anxiety levels remain high for them. Parents may require greater intervention to overcome their anxiety. The effectiveness of viewing a video

Fear and anxiety in a child undergoing surgery are correlated positively with the parent's level of anxiety, and interventions to decrease the parent's anxiety are appropriate. The purpose of this study was to determine whether viewing a video of an actual pediatric inhalation induction would reduce the level of parental anxiety.

Eighty patients requiring an inhalation anesthetic induction were selected and randomized to 2 groups. Parents in the experimental group (group 1; n = 40) viewed a video demonstrating pediatric mask induction. Parents in the control group (group 2; n = 40) received an information pamphlet only. Anxiety was measured perioperatively in the parents and their children.

Mean arterial pressure for children in group 1 was significantly lower during preoperative holding and following induction ($P < .05$). The level of anxiety postoperatively of children and parents in group 1 was significantly lower than that of children and parents in group 2 ($P < .05$).

Viewing a preoperative video seems to be beneficial. Decreasing the parent's level of anxiety preoperatively may have a positive effect on the child's level of anxiety expressed postoperatively.

Key words: Anxiety, child, induction, State-Trait Anxiety Inventory, video.

demonstrating the anesthetic induction process and its relation to the degree of parental anxiety and satisfaction during the process have not been measured simultaneously. The purpose of the present study was to determine whether viewing a video of a pediatric inhalation induction would reduce the level of parental anxiety.

Materials and methods

This was a prospective study using a convenience sample of pediatric patients requiring inhalation anesthetic induction. Parents were selected from those with children undergoing the elective surgeries of myringotomy and tonsillectomy. The parents of each patient were randomized to 2 different interventions, a video and a pamphlet (intervention; group 1) or a pamphlet (control; group 2). The educational pamphlet explained the events expected during the perioperative period. The study was approved by the institutional review board of the hospital, and written informed consent was obtained from all parents. Eighty ASA physical status I or II pediatric patients aged 10 months to 10 years who were scheduled for elective outpatient surgery were included in the study.

All children underwent similar perioperative treatment. Children were randomized to the same groups as their parents. There were 40 children in each group. Parents and children old enough to comply were instructed not to reveal to the raters their method of preparation. Parents in group 1 read the pamphlet and then viewed the 2-minute instructional video demonstrating a pediatric mask induction. Parents in group 2 received the pamphlet only. Children who previously had surgery, children with a pregnant mother, and children whose anesthesiologist or surgeon refused cooperation were excluded from the study.

The blood pressure and pulse rate of parents in both groups were taken on arrival to the ambulatory surgical unit, immediately after reading the pamphlet, following video viewing, before entering the operating room, and immediately after the induction of the patient. Parent and child anxiety were measured by the State portion of the STAI on admission, after reading the pamphlet, and (for children) following the operation. The State portion of the STAI evaluates a respondent's feelings of apprehension, tension, and nervousness related to physical danger and psychological stress and is used extensively to assess anxiety related to unavoidable stressors.⁹

The STAI consists of 20 items indicating how respondents feel at the moment of assessment (ie, I am tense, I am jittery). Scores from the STAI range

between 20 and 80 and correlate highly with other measures of anxiety. The STAI has high reliability and validity for assessing individual differences in the experience of anxiety. Reliability, the degree of consistency with which an instrument measures the intended attribute, for the STAI ranges from 0.92 to 0.94 under stressful conditions.⁹

Each child's behavior was measured by parental assessment using a 5-item scale eliciting responses on activity level such as quiet and cooperative, disturbed and anxious, or turbulent and uncontrollable. Behavior was measured at 4 stages during the perioperative process: (1) in the outpatient surgery room, (2) in the preoperative holding area, (3) immediately before anesthetic induction, and (4) postoperatively in the postanesthesia care unit.

Before discharge, parents in both groups completed an opinion survey about their experience accompanying their child into induction. This in-house instrument used a 5-item Likert scale indicating the level of agreement about the benefit of the presence of a parent during preoperative and induction periods. Items included self-reported level of benefit to the child and to themselves, the level of satisfaction with being prepared and with the video, and the level of support for parental presence during induction. This survey was used for descriptive purposes.

Two weeks after surgery, parents from both groups were contacted, and the child's disposition at home after discharge was obtained based on a 27-item questionnaire. Items measured the level of change in the child's need for comfort measures, level of fear, emotions, attention span, and fussiness after surgery. The instrument's reliability was tested with the Cronbach alpha index and showed good reliability of 0.80. The tool measured posthospital disposition in children with a 5-item Likert scale using 1 for *much less than before*, 3 for *same as before*, and 5 for *much more than before*.¹⁰

Statistical analysis included dependent Student *t* test to determine differences in postinduction anxiety compared with baseline levels. Hemodynamic variables were expressed as the means (\pm 1 SD) and tested for significance by an independent Student *t* test. Differences in anxiety scores between postoperative measures and baseline were compared by using a dependent Student *t* test. Mean differences in anxiety levels (and any change in anxiety from baseline) between groups were tested with an independent Student *t* test, as were mean differences in the child's behavior scores. Results of the posthospital behavior scores also were compared with an independent Student *t* test. Descriptive results are reported as mean (\pm 1 SD) or as percentage frequencies.

Results

A total of 80 parents and their children participated in this study. Demographic data are shown in Table 1. The 2 groups of children did not vary significantly with respect to sex of the accompanying parent, preoperative midazolam use, number of preoperative tours, and anxiety scores on the State portion of the STAI.

Mean arterial pressure (mm Hg), pulse pressure (mm Hg), and heart rate (beats per minute) of the parents did not differ between groups 1 and 2 at baseline (Table 2). Although the mean arterial blood pressure increased in both groups on the outpatient surgical unit after reading the educational pamphlet and/or viewing the video, there was a significant difference ($P < .05$) in mean arterial blood pressure preoperatively and after induction (Figure 1). The mean arterial pressure was 4 mm Hg lower in group 1 compared with group 2 in the preoperative holding area and after anesthetic induction. Heart rate progressively increased perioperatively in both groups from the outpatient surgical unit through anesthetic induction. However, the increase was significant only for group 2 ($P < .05$). Similarly, pulse pressure progressively increased in group 2 and less so in group 1. The differences between groups did not reach significance ($P > .05$).

No statistically significant difference was observed for mean parental anxiety between groups (Figure 2). The mean difference in the anxiety level of the child postoperatively was significantly lower in group 1 ($P = .01$) compared with group 2 (Figure 3).

Posthospital behavior scores of the children were obtained 2 weeks postoperatively. The score for group 1 (mean = 83) was significantly lower than the score for group 2 (mean = 85) ($P = .016$) (Table 2).

Table 1. Demographic data for groups 1 and 2*

Characteristics	Group 1 (n = 40)	Group 2 (n = 40)	P†
Accompanying parent male	8 (25)	7 (21)	.43
Received preoperative midazolam	15 (38)	12 (30)	.54
Mean age (y)	3.7	3.6	.81
Preoperative tour	5 (13)	7 (18)	.44

* See the text for a definition of the groups. Data are given as number (percentage) unless otherwise indicated.

† The level of P for significance was set at $< .05$.

Discussion

Our study suggests that when parents view a video demonstrating an inhalation anesthetic induction, parental and child anxiety decreases. Although one parent thought that the video was too graphic to watch, others thought viewing the video was a positive experience. The decrease in parental anxiety is supported by a decrease in the parent's mean arterial pressure in the preoperative holding area and after anesthetic induction.

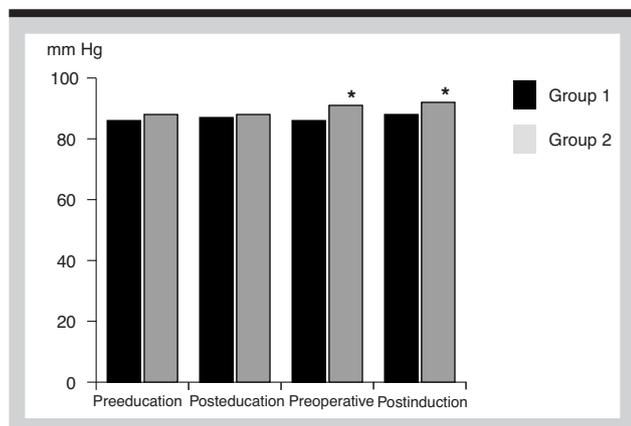
The mechanism for such a decrease is through release of catecholamines (eg, epinephrine, norepi-

Table 2. Parents' mean hemodynamic variables and mean anxiety scores for groups 1 and 2*

Variable	Group 1	Group 2	P
Mean arterial pressure (mm Hg)			
Preeducation	86 (6.0)	88 (8.3)	.08
Posteducation	86 (6.9)	88 (8.5)	.22
Preoperative holding area	86 (7.0)	91 (7.8)	.009
Postinduction	88 (7.2)	92 (7.7)	.019
Pulse pressure (mm Hg)			
Preeducation	43 (10)	45(11)	.31
Posteducation	42 (11)	46(11)	.77
Preoperative holding area	46 (11)	49(11)	.97
Postinduction	50 (12)	54(10)	.77
Heart rate (beats per minute)			
Preeducation	76 (9.5)	76 (8.0)	.47
Posteducation	77 (9.6)	77 (8.5)	.58
Preoperative holding area	78 (10.2)	81 (9.2)	.61
Postinduction	79 (9.4)	82(10.5)	.81
State-Trait Anxiety Index scores			
Preeducation	42 (5.1)	42 (4.2)	.55
Posteducation	42 (6.3)	43 (5.3)	.86
Postinduction	43 (7.2)	42 (5.9)	.56
Child behavior scores			
Preoperative	1.4	1.3	.28
Induction	1.9	2.1	.51
Postanesthesia care unit	1.6	2.2	.013
Posthospital anxiety score	83 (1.8)	85 (7.3)	.016

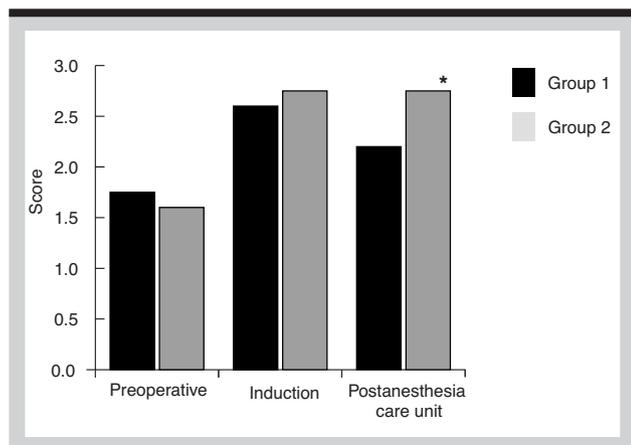
* Data are given as number (SD) unless otherwise indicated.

Figure 1. Comparison of mean parental arterial pressures at 4 assessment intervals: before watching the educational video (preeducation), after watching the video (posteducation), in the preoperative holding area (preoperative), and following induction (postinduction)



* $P < .01$. See the text for a definition of the groups.

Figure 3. Comparison of mean child anxiety scores (State portion of the State-Trait Anxiety Index) among groups at intervals: preoperative, induction, and postanesthesia care unit

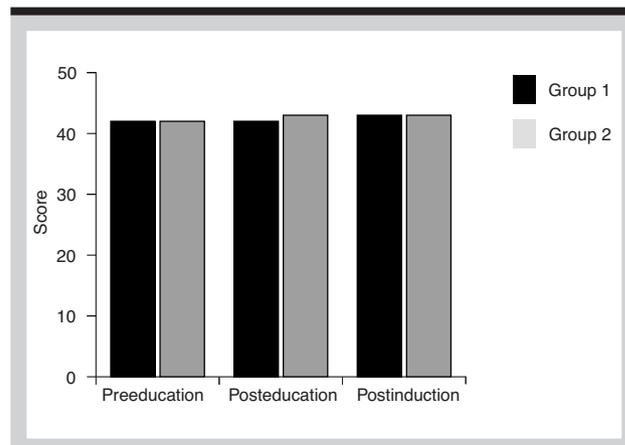


* $P = .01$. See the text for a definition of the groups.

nephrine, and dopamine), which subserve functions related to emotion.⁶ Peripheral adrenergic receptors are located in blood vessels, heart, and lung tissue and respond to adrenergic stimulation. This results in vasoconstriction, increased blood pressure, and increased heart rate. It is clear that the sympathetic nervous system is involved in responding to external stimuli and anxiety.

We observed a significant decrease in postoperative anxiety in children in group 1. However, no significant decrease in parental anxiety occurred as measured by the State portion of the STAI. The lack of an effect on anxiety in the parents supports other find-

Figure 2. Comparison of mean parental anxiety scores (State portion of the State-Trait Anxiety Index) among groups at intervals: preeducation, posteducation, and postinduction



ings. Parents are equally anxious whether they are separated from their child before induction or following induction.⁸ Although the effect on parental anxiety was not significant, the difference may have been enough to affect their children positively. Our findings and those of others^{6,8} show decreased vital signs and a lower anxiety score in the parents who are present during induction, although the differences do not reach statistical significance.

Although the findings of Hannallah and Rosales⁵ suggest that the presence of parents during induction decreases the need for pediatric premedication due to lower anxiety levels, our findings do not support this. Our findings suggest that the children pretreated with oral midazolam did not have a significantly lower anxiety score during induction ($P = .169$) or in the recovery room ($P = .632$) than those not pretreated as a whole. This may be due to the parent's presence, which results in a significant decrease in the number of upset or agitated children during the preinduction and induction periods of anesthesia.⁵

In children in group 1, no significant correlation was noted between their level of anxiety in the recovery room and their postoperative behavior score level ($r = 0.117$; $P = .236$). These findings are in contrast with McGraw's findings, which suggest that children who experience a turbulent anesthetic induction are at particular risk for postoperative behavior disturbance and that children who are less anxious during the perioperative period will experience fewer behavioral disturbances postoperatively.² However, our results for this correlation are temporally problematic as anxiety was measured in the hospital, and the behavioral scores were obtained 2 weeks postoperatively.

There are documented benefits of parental partici-

pation in their child's operative experience. Observations from the present study suggest that decreasing a parent's anxiety about the child's operative experience also benefits the child positively. Implementation of such a program is not resource intense. The equipment and amount of staff time necessary to provide this service to parents is minimal, making this intervention a practical one. A television with a video player is the only equipment necessary. The video could be played for the parent on arrival at the ambulatory surgical unit before going to the preoperative holding area. Since the video is only 2 minutes long, the staffing cost would be minimal, and the nurse liaison (who follows up the family perioperatively) could be present during the viewing to answer questions.

Our results suggest that viewing a short video demonstrating a pediatric inhalation induction is an acceptable adjunct for preparing parents to be with their child during anesthetic induction. The equipment needed is minimal, and the intervention is cost-effective. Minimal time is required to set up the video, show it to parents, and answer questions. Viewing a video seems to be clinically beneficial by decreasing parental blood pressure levels and decreasing child anxiety. The presence of parents who are present *and* calm for induction may result in a very positive experience for children undergoing surgery.

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