

Assessment of Effect of Midazolam on Anxiety in Children Undergoing Surgical Procedures

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Abstract

Background: To assess effect of midazolam on anxiety in children undergoing surgical procedures. **Methods:** Fifty- four children age ranged 6-14 years scheduled for surgery were divided into group 1 containing those who were undergoing surgery for the first time and group 2 had patients with a history of previous surgery within the last 2 years. Baseline anxiety of children was measured using the modified Yale Preoperative Anxiety Scale (mYPAS). **Results:** Time from premedication to second assessment (min) was 23.4 in group 1 and 23.7 in group 2, time from premedication to parental separation (min) was 28.4 in group 1 and 28.3 in group 2, time from premedication to mask induction (min) was 30.5 in group 1 and 31.7 in group 2, anxiety score at baseline was 33.4 in group 1 and 42.5 in group 2, after 20 minutes was 31.6 in group 1 and 34.8 in group 2. Incidence of high anxiety (mYPAS >30) at baseline was 20 in group 1 and 26 in group 2, after 20 minutes was 19 in group 1 and 20 in group 2. A non-significant difference was observed ($P > 0.05$). **Conclusion:** No difference was seen in anxiety scores after premedication with midazolam as in children with history of previous anaesthesia exposure and those experiencing anaesthesia for the first time.

Key words: Anxiety, Anesthesia, Midazolam, Surgery.

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Introduction

Child anxiety during medical procedures is a growing trend and dental treatment is not an exception.^[1] In today's dentistry, parents and caregivers may not be contented with some non-pharmacological behavior management techniques such as voice control, hand over mouth, and intimidation.^[2,3] When treating a child with limited cooperation margin due to fear or anxiety, the use of physical restraining might not result in a satisfactory outcome, especially if the child is in need of comprehensive dental treatment which may necessitate the use of general anesthesia.^[4] Physical restraining in the dental office affects the image of the pediatric dentist and may harm the self-respect of the child at a very young stage of psychological development not to mention the legal implications of harming a vulnerable human being.^[5] Previous history of surgery has been found to be one of the risk factors for increased preoperative anxiety in some studies.^[6,7] However, these findings have not been confirmed by other investigators.^[8] In our clinical practice, we have observed that children who

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have undergone surgery in recent past exhibit increased levels of anxiety when rescheduled for surgery and remain anxious even after premedication. Midazolam is an approved sedative medication used for medical procedures.^[9] The present study was undertaken with the aim to assess effect of midazolam on anxiety in children undergoing surgical procedures.

Materials and Methods

Fifty- four children age ranged 6-14 years scheduled for surgery belonging to American Society of Anesthesiologists' physical status I or II under general anaesthesia. Consent from their parents were obtained before initiating the study. Approval for the study was obtained from ethical clearance and review committee.

Case history proforma was made which contains data related to each patient such as name, age, gender etc. Grouping of patients into group 1 containing those who were undergoing surgery for the first time and group 2 had patients with a history of previous surgery within the last 2 years.

Baseline anxiety of children was measured in the preoperative holding room using the modified Yale Preoperative Anxiety Scale (mYPAS). Patients were premedicated with 0.5 mg kg⁻¹ of oral midazolam syrup about 20–30 min prior to induction of general anaesthesia. Anxiety was reassessed 20 min after premedication on a 4-point scale (1 = crying, very anxious; 2 = anxious, not crying; 3 = calm, but not cooperative; 4 = calm, cooperative or asleep). Anaesthesia was induced with sevoflurane (8%) in oxygen using a transparent mask. Mask acceptance during induction of anaesthesia was graded on a 4-point scale (1 = combative, crying; 2 = moderate fear of the mask, not easily calmed; 3 = cooperative with reassurance; 4 = calm, cooperative or asleep). Parental separation and mask acceptance scores of 1 or 2 were considered unsatisfactory, while scores of 3 or 4 were considered satisfactory effects of premedication. Results of the present study after recording all relevant data were subjected for

statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05 and highly significant if it is less than 0.01.

Results

Table 1: Distribution of patients

Parameters	Group I	Group II
M:F	15:12	16:11
Weight (Kg)	16.4	17.1
Height (cm)	106.2	108.4

There were 15 males and 12 females and 16 males and 11 females in group I and II respectively [Table 1].

Table 2: Comparison of parameters

Variables	Parameters	Group I	Group II	P value
Time from premedication to second assessment (min)		23.4	23.7	0.81
Time from premedication to parental separation (min)		28.4	28.3	0.90
Time from premedication to mask induction (min)		30.5	31.7	0.73
Anxiety score	Baseline	33.4	42.5	0.12
	After 20 minutes	31.6	34.8	0.80
Incidence of high anxiety (mYPAS >30)	Baseline	20	26	0.15
	After 20 minutes	19	20	0.17

Time from premedication to second assessment (min) was 23.4 in group 1 and 23.7 in group 2, time from premedication to parental separation (min) was 28.4 in group 1 and 28.3 in group 2, time from premedication to mask induction (min) was 30.5 in group 1 and 31.7 in group 2, anxiety score at baseline was 33.4 in group 1 and 42.5 in group 2, after 20 minutes was 31.6 in group 1 and 34.8 in group 2. Incidence of high anxiety (mYPAS >30) at baseline was 20 in group 1 and 26 in group 2, after 20 minutes was 19 in group 1 and 20 in group 2. A non- significant difference was observed (P> 0.05) [Table 2, Figure 1].

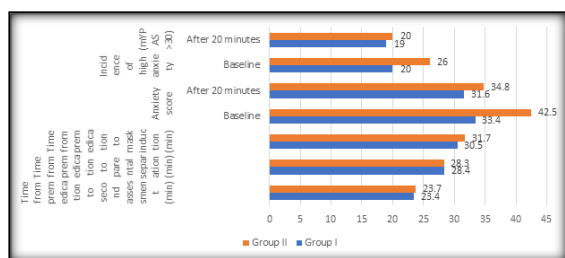


Figure 1: Comparison of parameters

Discussion

Surgery and anaesthesia are stressful events for children. A large proportion, up to 40%–60%, experience high levels of anxiety in the preoperative period.^[10] Increased preoperative anxiety not only

causes distress to the child and parents but also delays the induction and recovery from anaesthesia, increases the patient’s pain experience and increases the likelihood of emergence delirium and maladaptive behaviour.^[11] Midazolam, an imidazobenzodiazepine, acts on GABAA receptors to reduce anxiety, leading to sedation, anterograde amnesia, anticonvulsant effects, and centrally produced muscle relaxation.^[12] Because it has high lipid solubility at physiological pH, midazolam quickly passes through the blood–brain barrier and has a fast onset of action. In addition, the rapid redistribution of midazolam leads to a rapid recovery. For these reasons, midazolam is the most popular premedication drug used during anesthesia induction before surgery.^[13] However, the effect of midazolam premedication remains controversial and the drugs’ side effects include paradoxical reactions, oversedation, decreased blood pressure, and respiratory depression. In this regard, some clinicians question the clinical benefits of benzodiazepine premedication and argue that non-pharmacological methods alone are sufficient to reduce preoperative patient anxiety.^[14] The present study was undertaken with the aim to assess effect of midazolam on anxiety in children undergoing surgical procedures.

In present study, there were 15 males and 12 females and 16 males and 11 females in group I and II respectively. Mountain et al¹⁵ reported that a dose of 0.5 mg/kg significantly reduces preoperative anxiety and helps in anesthetic mask acceptance by children. They compared Midazolam to Dexmedetomidine as preoperative anxiolytic medications and reported that the latter has an advantage of reducing postoperative ED.

McMillan et al,^[16] reported no beneficial effect using higher doses of 0.75 mg/kg and 1.0 mg/kg compared to 0.5 mg/kg. They also reported more side effects with higher doses, such as prolonged postoperative recovery time and undue over sedation. The potential for adverse effects is a major concern regarding routine preoperative medication. Consequently, before suggesting routine use of Midazolam premedication, more studies on a larger scale are recommended to identify patients who might not benefit from Midazolam preoperative medication.

We found that time from premedication to second assessment (min) was 23.4 in group 1 and 23.7 in group 2, time from premedication to parental separation (min) was 28.4 in group 1 and 28.3 in group 2, time from premedication to mask induction (min) was 30.5 in group 1 and 31.7 in group 2, anxiety score at baseline was 33.4 in group 1 and 42.5 in group 2, after 20 minutes was 31.6 in group 1 and 34.8 in group 2. Incidence of high anxiety (mYPAS >30) at baseline was 20 in group 1 and 26 in group 2, after 20 minutes was 19 in group 1 and 20 in group 2. Batawi et al,^[17] in their study seventy-eight American Society of Anesthesiology (ASA) I children were divided into two groups of 39 each. Children of the first group were premedicated with oral Midazolam 0.5 mg/kg, while children of the control group were

premedicated with a placebo. Scores for parental separation, mask acceptance, postoperative emergence delirium, and time spent in the post-anesthesia care unit were compared statistically. The test group showed significantly lower parental separation scores and high acceptance rate for anesthetic mask. There was no significant difference between the two groups regarding emergence delirium and time spent in post-anesthesia care unit. Davidson et al,^[18] observed that hospital admission via the day-stay ward was associated with less anxiety. This may be due to the fact that day-care patients stay in a familiar environment and with people they know right till the time of surgery as opposed to admitted patients who are exposed to an unfamiliar environment and unknown people the night before surgery.

Conclusion

Authors found no difference in anxiety scores after premedication with midazolam as in children with history of previous anaesthesia exposure and those experiencing anaesthesia for the first time.

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