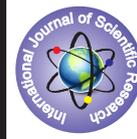


Comparative Study Of Postoperative Agitations And Ease Of Venipuncture After Intranasal Dexmedetomidine and Midazolam as Premedication In Children Of Age Group Of 2-7 Years



Anaesthesiology

KEYWORDS: Premedication, anxiety, Dexmedetomidine, Midazolam

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ABSTRACT

Background : Agitation is seen in children and most commonly post operative. There is increase sympathetic drive due to this. Post operative complications are seen in many children and it increases anxiety and concern of

the parents also. The purpose of this study is to compare postoperative agitations and ease of venipuncture after Intranasal Dexmedetomidine and Midazolam of age group between 2-7 years. **Methods:** This study was conducted as a randomized clinical trial among 60 children who undergone elective surgery. The patients were randomly allocated into two groups. Group D - children received dexmedetomidine, 1 µg/kg intranasally 40 - 45 min prior to anaesthesia induction. Group M - children received midazolam 0.2 mg/kg intranasally 40 - 45 min prior to anaesthesia induction. **Results :** About 53.3% of the study subjects had a score of 5-6, 33.3% had a score of 3-4 and 13.3% had a score of 0 - 2. In the Midazolam group, 46.7% had score of 3 - 4, 33.3% had a score of 0 - 2 and 20% had a score of 5 - 6. This difference was statistically significant. **Conclusion:** Dexmedetomidine had better ease of venipuncture than midazolam i.e more analgesic effect. Dexmedetomidine had shown lesser incidence of post operative agitation than midazolam.

INTRODUCTION

Premedication is commonly used to reduce the preoperative anxiety, to facilitate the separation from parents and to promote acceptance of mask induction. Among the different goals that can be achieved with premedication, the primary objective in children is anxiolysis. Premedication that effectively calms the child also minimizes the parental anxiety.^{1,2}

Anesthesia and surgery represent an enormous time of stress for the child. The reasons for the stress can include separation from the parents, strange surroundings, painful procedures, frightening procedures and survival.³ Hence, premedication plays an important role for pediatric patients who are posted for surgery. Pediatric patients are more uncooperative during securing IV line, IV/IM drug administration, separation from parents and induction of anesthesia.^{4,5}

The studies available has shown that about 50 -75% of the children shows signs of significant preoperative fear and anxiety.⁶ It has also been reported that there are correlations between the heart rate, blood pressure and behavioral ratings of anxiety.⁷ In order to alleviate physiological and psychological effects of preoperative anxiety in children, most anesthesiologists use either parental presence or sedative premedication, since separation from parents and induction of anesthesia are considered the most perioperative stress inducing phases. Both approaches are considered appropriate choice of interventions. Anesthesiologists who allow parental presence during induction of anesthesia, use sedative premedication least frequently, and vice versa.^{8,9}

The drugs which are commonly used for sedation and anxiolysis are midazolam, ketamine, clonidine and dexmedetomidine. Route of administration of these drugs is mainly parenteral, which make it more invasive and painful^{10,11,12}

The ideal premedication in children should be readily acceptable and

should have a rapid and reliable onset with minimal side effects. The drugs which have been tried as premedication is ketamine, it is an easily administered parenteral anesthetic that produces profound analgesia in subanaesthetic doses and lacks the cardio-respiratory depression seen with most other general anesthetics, but it produces excessive salivation and hallucination.¹³

Midazolam is a water soluble benzodiazepine and most commonly used sedative premedicant in children. The advantages of midazolam include rapid onset, effective sedation, anterograde amnesia, anxiolysis and reduction in post operative vomiting. However, the undesirable effect such as restlessness, hiccups and paradoxical hyperactive reaction, that accompany the use of midazolam render this drug a less than ideal sedative.¹⁴

Dexmedetomidine is a highly selective alpha - 2 agonist with both analgesic and sedative effects. It produces a type of sedation recognised as cooperative or arousable which is different from the clouding of consciousness sedation included by drugs acting on the GABA system. These characteristics make it potentially useful for anesthesia premedication in children.¹⁵

This topic had been chosen for study, due to difficulty in securing IV line, excessive cry and apprehension, intranasal (Dexmedetomidine and Midazolam) help us to get rid of apprehension, several unwanted pricks to secure IV line, excessive crying and achieve the goal, i.e. pediatric patients free from anxiety, inapprehensive about separation from parents and uncooperative during induction of anesthesia.

AIM AND OBJECTIVE

- To compare and evaluate the efficacy of intranasal dexmedetomidine and midazolam on reduction in postoperative agitations
- To compare ease of venipuncture than midazolam i.e analgesic effect

after intranasal dexmedetomidine and midazolam.

MATERIALS AND METHODS

About 60 children belonging American Society of Anesthesiologists (ASA) Grades I and II of both sexes, aged between 2 and 7 years who posted for general surgery and pediatric surgery in Rajendra Institute of Medical sciences, Ranchi, Jharkhand, were included as study sample in this study. They were randomly allocated to two groups Group D and Group M, using closed envelope method and each comprising of 30 children. An informed consent, written and bilingual consent was obtained from the parents of the children before they were included in to study. Ethical clearance was obtained from the institutional ethical committee.

- Group **D** - children received dexmedetomidine, 1 µg/kg intranasally 40 – 45 min prior to anaesthesia induction.
- Group **M** - children received midazolam 0.2 mg/kg intranasally 40 – 45 min prior to anesthesia induction.

Premedication were given to children in the preoperative holding area in the presence of parents. Intranasal drug was given into both nostrils using a 1 ml insulin syringe with the child in the recumbent position. To avoid from trickling to pharynx 3-4 drops were given in each nostril and then repeated the remaining dose after 2 minutes. Baseline parameters like heart rate (HR), noninvasive blood pressure (NIBP) and SpO₂ recorded in both groups at 10 minutes interval.

Pre anesthetic assessment:

All patients were visited and evaluated for fitness for the intended procedure and anesthesia on the day prior to the surgery. During this visit, the procedure of the study planned was explained to the parents. An attempt was made to alleviate the anxiety of the patients. Patients were nil per oral by guidelines. General clinical examination of the patients was performed including a general physical and systemic examination.

A thorough laboratory examination was performed on all the subjects of the study including complete blood picture, HIV and HBsAg. Routine urine examination and chest x – ray if required. No oral liquids up to 3 hours before the procedure and avoidance of milk/ solids for 6 prior to the procedure.

Premedication

Midazolam 0.2 mg/kg body weight intranasal 40-45 minutes prior to induction in group **M**

Dexmedetomidine 1 microgram/kg body weight intranasal 40-45 min prior to induction in group **D**

- Inj. Glycopyrrolate 10 microgram/kg body weight IV, was given 5-10 minutes prior to inductions.
- Inj. Ondansetron 0.1 mg/kg body weight IV, was given 5-10 minutes prior to inductions.
- Inj. Fentanyl 2 microgram/kg body weight IV, was given 5-10 minutes prior to inductions.

Anaesthesia will be induced with :

- Pre oxygenation done for 3-5 minutes with 100% oxygen.
- Inj. Thiopentone 5 mg/kg body weight IV
- Inj. Atracurium 0.5 mg/kg body weight IV given and IPPV done for 3-4 minutes with bag and mask.
- Appropriate size ETT placed and position secured.

Anesthesia was maintained with :

- N₂O:O₂ 40-60%
- Sevoflurane 1-1.5%
- Incremental dose of atracurium
- Reversal was done by inj. Neostigmine 50-70 microgram/kg plus Inj. Glycopyrrolate 10 microgram/kg IV.

MONITORING

- Continuous monitoring of heart rate, blood pressure, ECG
- Respiratory rate, tidal volume, ETCO₂.

Assessment of post operative agitation was assessed using modified objective pain scale¹⁶

Criteria	Character	Score
Tear	Absent	0
	Present but child can be consoled	1
	Present but child cannot be consoled	2
Movement	Absent	0
	Moderate agitation	1
	Intense agitation	2
Behaviour	Sleeping of calm	0
	Grimacing, trembling voice can be calmed down	1
	Frightened, sticks to parents cannot be calmed down	2

Agitation was defined by a total modified objective pain scale of >3 or equal to 3 for these three criteria.

Ease of Venipuncture was Graded as follows:

Description	Score
Poor	1
Fair	2
Good	3
Excellent	4

Statistical analysis

P < 0.001 was considered as highly significant

OBSERVATIONS & RESULTS

Table 1. Distribution of patients according to ease of venipuncture

Ease of Venipuncture	Group	
	Group D N=30 (%)	Group M N=30 (%)
Excellent	13 (43.3)	4 (13.3)
Good	14 (46.7)	11 (36.7)
Fair	3 (10.0)	12 (40.0)
Poor	0	3 (10.0)
Total	30 (100)	30 (100)

P value=0.004, Sig- Significant

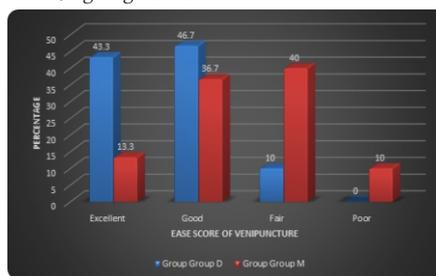


Figure 1. Distribution of patients according to ease of venipuncture

The ease of venipuncture scale had shown that, 43.3% of the children in dexmedetomidine group and 13.3% in midazolam group had shown excellent venipuncture, 46.7% in dexmedetomidine group and 36.7% in midazolam group had shown good results, 10% in dexmedetomidine group and 40% in midazolam group had shown fair results and 10% in midazolam group had shown poor result. This difference in ease of venipuncture was statistically significant between the dexmedetomidine and midazolam groups.

Table 2. Distribution of patients according to modified objective pain score

Modified objective pain score	Group	
	Group D N=30 (%)	Group M N=30 (%)
0 – 2	4 (13.3)	10 (33.3)
3 – 4	10 (33.3)	14 (46.7)
5 – 6	16 (53.3)	6 (20.0)
Total	30 (100)	30 (100)

P value=0.02, Sig:- Significant

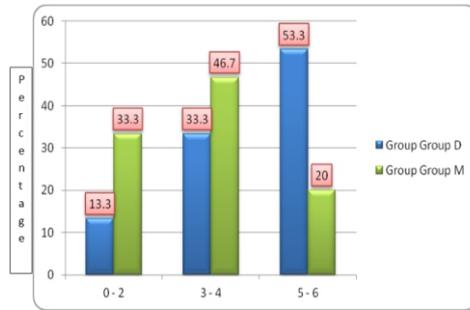


Figure 2. Distribution of patients according to modified objective pain score

The table and Figure no 2 shows the distribution of study groups according to Modified objective pain score. About 53.3% of the study subjects had a score of 5-6, 33.3% had a score of 3-4 and 13.3% had a score of 0 – 2. In the Midazolam group, 46.7% had score of 3 – 4, 33.3% had a score of 0 – 2 and 20% had a score of 5 – 6. This difference was statistically significant

Conclusion

- Dexmedetomidine had better ease of venipuncture than midazolam i.e more analgesic effect.
- Dexmedetomidine had shown lesser incidence of post operative agitation than midazolam.

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