Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 08, 2023

Original Research Article

A COMPARATIVE STUDY OF ORAL CLONIDINE AND ORAL MIDAZOLAM AS PREMEDICATION IN PEDIATRIC AGE GROUPS UNDERGOING TONSILLECTOMY

[1]Dr. Akshay Margutti, [2]Dr. Priyanka Kanni, [3]Dr. Prema Bangonda, [4]Dr. Yuvaraj Shashidhar

[1,3] Senior Resident, Dept. of Anaesthesiology, ESIC Medical College and Hospital Kalaburagi
[2,4]Assistant professor, Dept. of Anaesthesiology, ESIC Medical College and Hospital Kalaburagi

Corresponding Author: Dr. Yuvaraj Shashidhar

Article History: **Received:** 11.07.2023 **Revised:**20.07.2023 **Accepted:1**0.08.2023

Abstract

The concept of premedication was introduced in early 1900s.The administration of drugs before the induction and maintenance of anaesthesia is reffered to as Preanaesthetic medication

Materials and Methods: This study done at Dept of Anaesthesiology, Esic medical college and hospital Kalaburagi. A study group of 100 patients of age group 4 -12 yrs undergoing tonsillectomy undergeneral anaesthesia were selected.

Results: Significance of T Test for age 0.853, insignificant Significance of Chi square Test for Sex 0.812, insignificantSignificance of T Test for Weight 0.837, insignificant

Conclusion: We concluded from our study that oral clonidine and midazolam can be used as better premedicants to produce optimal sedation and emotional state .

Keywords: Tonsillrctomy, Childrens, Medications

Introduction

A need exist for an efficient premedicant drug especially in paediatric age group undergoing elective surgical procedures. Anxiety and fear of operation, injections, physicians, operation theater environment, and parental separation are all traumatizing experiences in young children resulting in postoperative maladaptive behavioral changes .Premedication[1] should yield a patient who is calm, free ofanxiety and pain, sedated, but easily arousable and fully co-operative. The concept of premedication was introduced in early 1900s.The administration of drugs before the induction and maintenance of anaesthesia is reffered to as Preanaesthetic medication

The term premedication was first used in the 1920s..One of the ,commonly used premedicant in paediatric anaesthesia drug worldwide is midazolam[2]. Clonidine ,an alpha 2 agonist ,central sympatholytic agent used as antihypertensive agent is a new trial in this category[3.4]. Inspite of all existing premedicants anaesthetic practitioners are still in search for an ideal premedication agent with better efficacy and minimal side effects .So I decided to compare the efficacy of midazolam and clonidine as oral premedication in children undergoing elective tonsillectomy.

Materials and Methods

The PH of both drugs were more than 2.5 and therefore chance of chemicalpneumonitis in case of aspiration is not there.

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 08, 2023

Table 1: Demographic profiles of the patients

Criteria	Clonidine (GroupI)	Midazolam (GroupII)	Test of significance (PValue)
Age	6.92	7	0.853
Sex(Male/Female)	39/11	38/12	0.812
Weight(Kg)	23.44	23.7	0.837

Significance of T Test for age 0.853, insignificant Significance of Chi square Test for Sex 0.812, insignificantSignificance of T Test for Weight 0.837, insignificant

- **Setting**: The study was conducted in a single centre, in a Teritiary teachingHospital.
- **Study Design**: Prospective randomized double blinded study of 100 patients.

A study group of 100 patients of age group 4 -12 yrs undergoing tonsillectomy undergeneral anaesthesia were selected. They were divided into 2 groups of 50 patients each by lots taking method. All even numbers were assigned to Group A and all odd numbers were assigned to Group B.

Group A (oral clonidine) received 4 mcg/kg 90 minutes before induction. Group B (oral midazolam) received 0.5 mg/kg 90 minutes before induction

Inclusion Criteria:

Age: 4-12 yearsBoth sexes ASA 1-2
Malampatti 1 & 2 Tonsillectomy under GA

Exclusion Criteria

ASA 3-4
Malampatti 3 & 4
Children with CNS disorder Obesity (weight >95 percentile)

Observation and Results

The PH of the solutions used were measured by using Merck PH indicator paper and confirmed by PH meter.

Table 2: Comparison of PH of Drugs

Group	PH
Clonidine	6.5
Midazolam	3.5

Both our study groups were comparable with respect to age , sex and weight

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 08, 2023

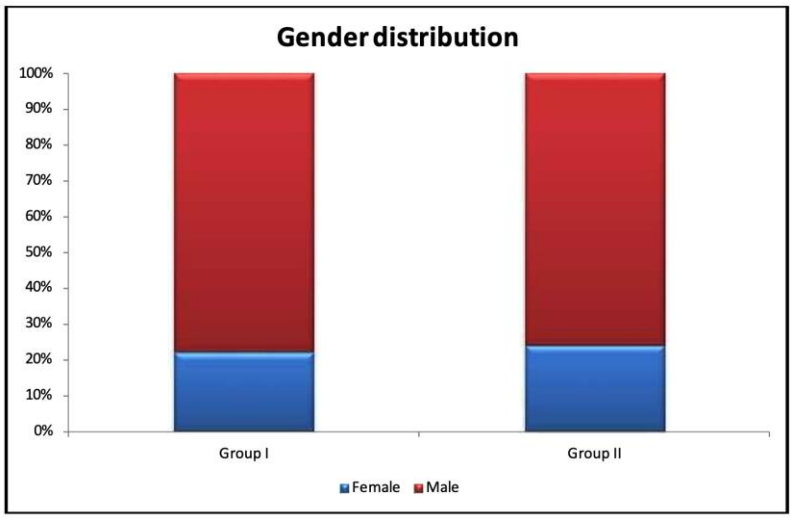

Figure 1:

All the patients were heamodynamically stable through out the proceure and HR,BPand Spo2 were comparable between both the groups.

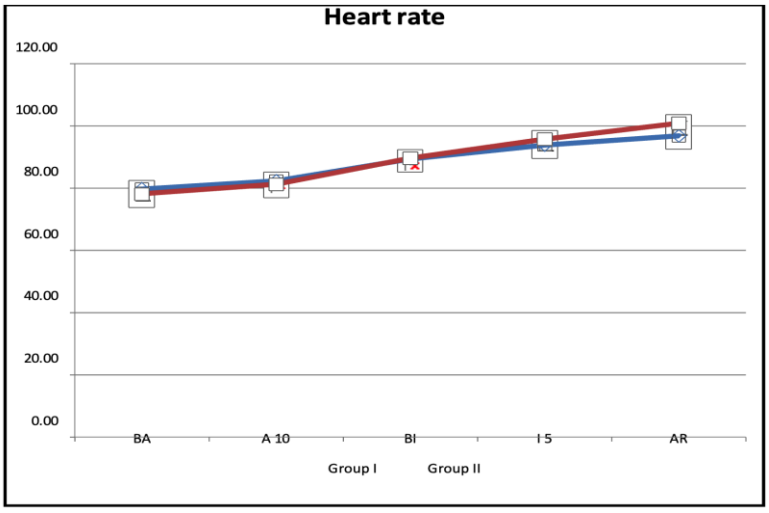

Figure 2:

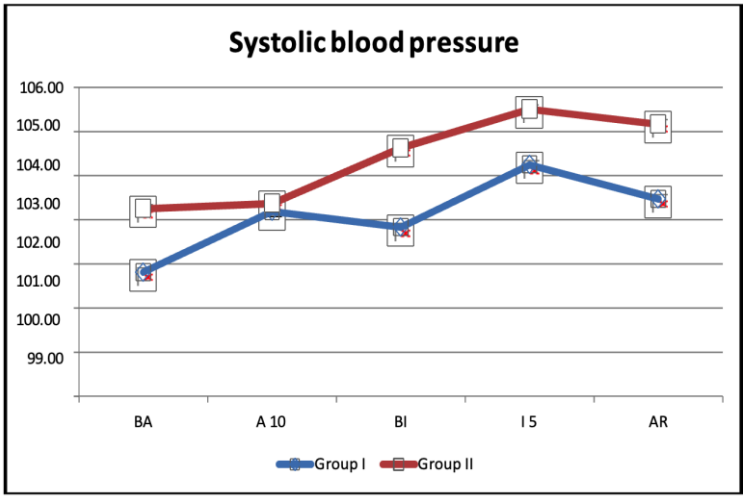

Figure 3:

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 08, 2023

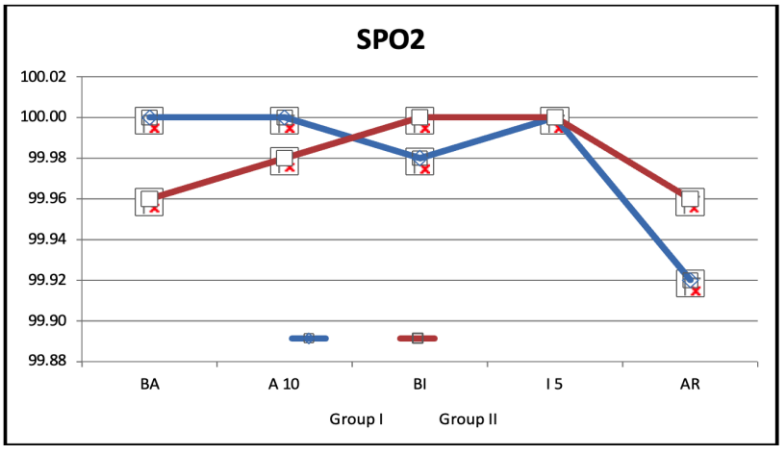

Figure 4:

Table 3: Reaction to Drug Administration

Count		Group		Total
		clonidine	Midazolam	
Reactionto drug	Crying	3	2	4
	Not crying	47	48	95
Total		50	50	100

The number of children crying at the time of administration of drugs werecomparable in both the study groups and was statistically insignificant

Table 4: Intensity of sedation on separation from mother

Score	Grade	Clonidine (Group I)	Midazolam (Group II)	Total
1	Alert	2	2	4
2	Awake	10	31	41
3	Drowsy	27	16	43
4	Sleep	11	1	12

11 children in clonidine group were asleep,27 were drowsy,10 were awake and 2 were alert at time of separation from parents.in midazolam group 1 was asleep,16were drowsy,31 were awake and 2 were alert .the sedation score was found to bebetter in clonidine group with statistical significance of 0.000

Table 5: Level of anxiety on separation from mother

score	Grade	Clonidine (Group I)	Midazolam (Group)	Total
1	Crying	0	4	4
2	Anxious	9	30	39
3	Calm/uncooperative	20	15	35
4	Calm/cooperative/Asleep	21	1	22

In clonidine group no children were crying,21 were calm and cooperative,19 were calm and uncooperative and 9 were anxious at the time of separation .In midazolam group 4 children

were crying,30 were anxious,16 were calm and cooperative and 1 was calm and cooperative at the time of separation from the parents
The sedation score was better in clonidine group with a significance of 0.000

Table 6: Intensity of sedation on Venopuncture

Score	Grade	Clonidine (Group I)	Midazolam (Group II)	Total
1	Alert	10	23	33
2	Awake	19	25	44
3	Drowsy	20	2	22
4	Asleep	1	0	1

In the clonidine group 10 children were alert ,19 were awake at the time of venopuncture In the midazolam group 23 children were alert ,25 were awake at time of venopuncture. The sedation was found to be better in clonidine group than in midazolam with statistical significance of 0.000 which is highly significant.

Discussion

The practice of anesthetic premedication was introduced soon after ether and chloroform were introduced as general anesthetics in the middle of the 19th century[5].By applying opioids benzodiazepines and anticholinergics before surgery, the patients undergoing surgery can achieve a less anxious state, and they would also acquire a smoother course during the tedious and dangerous induction stage. Premedication with opioids and anticholinergics was not a routine practice till the 20th century when intravenous anesthetics were primarily used as induction agents that significantlyshorten the induction time. In the ancient preanaesthetic days even wine and opium were given to lessen the terror of surgery .The current practice of anesthetic premedication incorporates several aspects of patient care such as decreasing anxiety, dampening intraoperative noxious stimulus and its associated neuro endocrinological changes, and reducing postoperative adverse effects of anesthesia and surgery.

The concept of anesthetic premedication was developed in 1850s in order to counteract the side effects of general anesthesia when ether and chloroform were widely used as inhalational anesthetics [5].In 1864 Nussbaum in Germany and Bernard in France, found out simultaneously that subcutaneous morphine can relax patients and intensify chloroform anesthesia. Around the same time, another French scientist named Dastre found that atropine can decrease salivation and antagonize the effects of respiratory depression and vomiting associated with morphine. There after morphine and atropine became popular anesthetic premedication in the late 19th century. It was not popularized until Dudley Buxton published the first paper regarding the use of morphine, atropine, scopolamine, and other similar agents prior toinhalation anesthesia in 1911.

Clonidine an alpha 2 agonist used as antihypertensive agent has been proved to have sedative and analgesic effect, prevents post operative nausea and vomiting. It has been under clinical trial as an efficient premedicant utilizing these properties of the drug.
Midazolam has been proved to be effective in reducing the preoperative anxiety level in many studies [6-16]. It was found that discharge from the recovery room in outpatient surgery was also not delayed in midazolam used patients. Except for midazolam, a2-agonists, antidepressants, and anticonvulsants are all effective in reducing the preoperative anxiety level

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 08, 2023

In our study we compared oral midazolam and oral clonidine as premedication inchildren undergoing tonsillectomy.

Anaesthesia and surgery creates a great psychological stress in most of the patients .The overall frequency of anxiety before anaesthesia was found to be 40
–60% in older children in a study conducted by Norris and Davis 1960) as many as around 80% of patients were found to be anxious in an extensive study conducted by Corman et al in 1958 by using a psychological questionnaire[5] . A greater frequency was found in females than in males.

Premedication was considered essential in children. The pilot study showed that premedicated children had better value of arterial oxygen saturation than unpremedicated anxious and apprehensive children. A positive correlation was reported between anxiolysis and ease of induction of anaesthesia (Lindgren, Saarni Vaara, Himberg 1980)[17] .This supports the importance of the anxiolytic componentsof premedication. The relief of apprehension may reduce excessive hormonal and circulatory responses to anaesthesia and may reduce the minimum effective dose of anaesthetic agents· Sedation was considered an useful property of premedicant $_{drug}$ [18-22].

In our study we used tablet form of clonidine dissolved in sugar syrup and given to thepatient. According to Teebeut et al [23] gastric contents with PH less than 2.5 is notorious to cause aspiration pneumonitis. The pH of the prepared clonidine solution is 6.5 and that of midazolam was 3.5 which is more than conservative pH limit of 2.5 thought to promote lung damage after aspiration of gastric contents.We noted a better profile with clonidine when compared to midazolam with respect to PH.

Conclusion

We concluded from our study that oral clonidine and midazolam can be used as better premedicants to produce optimal sedation and emotional state .Clonidine 4 μg / kg hasbeen shown to be a more effective premedication for children undergoing elective tonsillectomy than midazolam 0.5mg/kg.

References:

1. Cote C, Lerman J, Todres I. A Practice of Anesthesia for Infants and Children. Philadelphia, PA: Saunders/Elsevier; 2009 page 39-55
2. JN Cashman; Davies N.J.H; Lee Synopsis of anaesthesia 13th edition Pages 21- 23, 618-6192
3. Ronald . D Miller, Anaesthesia, eighth edition, P229-237,261,554
4. Stoeltings Pharmacology and physiology in anaesthetic practice 5th edition, pages 257-259
5. Anesthetic premedication: New horizons of an old practiceMichael J. Sheen , Fang-Lin Chang , Shung-Tai Ho
6. Efficacy oral midazolam premedication in children Anesthesiology 1990 nov 73(5) Feld, Lawrence H,Negus,Jean B,White ,Paul F.
7. Premedication of children with oral midazolam .Can journal of anesthesia 1992 jan 29,39(6),545-550 Co Mc millan, IAspahr-Schopfer N Sikick E Hartiey
8. Oral midazolam is an effective premedication for children having day stay anaesthesia NCBI , Pub med Gov..Anesthesia intensive care 1992 feb ,20(1) ,9- 14Parnis SJ,foote JA,Vander walt JH,short T,crowe CE

9. Oral midazolam in children :effect of time and adjunctive therapy. Anesthesia analgesia 1992 , 75, 51-55B craig Weldon MD, mehernoor F watha MD,paul Fwhite Phd,MD
10. Midazolam and Lorazepam as premedication.A Randomised Double blind study Ncbi ,pubmed.gov 1994 june 27;156(26) 3897-900 Bredhl C,KnudsenL,stjernholm PH, mandoe H,Grevy C,KirkengardL,Jensen S
11. Oral premedication with midazolam in paediatric anaesthesia :effects on sedation and gastric contents. Ncbi ;pubmed .gov paediatric anesthesia 1997;7(3) 191-6 Riva j, Lejbusiewicz G, papa M,Lauber C,Kohn W,dafonte M
12. Parental presence during induction of anesthesia versus sedative premedication: which intervention is more effective? Kain ZN1, Mayes LC, Wang SM, Caramico LA, Hofstadter MB Pubmed 1998 Nov;89(5):1147-56
13. Evaluation of Oral or Rectal Midazolam as conscious sedation for paediatric patients in oral surgery Military Medicine, Apr 2004 by Okcu, Kemal Murat, Guner, Aydintug, Yavuz Sinan, Gunaydin, Sencimen, Metin
14. Paediatric day case anaesthesia and pain control Lonnqvist, Per-Arne; Morton, Neil S, Dec 2006 Research gate scientific work ,current opinion anaethesiolgy 01/01/2007;19(6) 617-21.
15. Oral midazolam premedication for paediatric day care patients Pediatric anesthesia 2007,jan 30 ,6(4),265-270SH cray ,JL Dixon ,C M B Heard ,SELSBY
16. Effects of dexmedetomidine versus midazolam for premedication in paediatric anaesthesia with sevoflurane: A meta-analysis JiFeng Feng, Xiao-Xia Wang,
17. Yan-Yan Lu, Deng-ge Pang, Wei Peng, Jian-lan Mo
18. Martindale 33rd surgery – The complete drug reference 670- 672,710-712,2170- 1273
19. Effects of oral clonidine premedication on plasma glucose and lipid homeostasis associated with exogenous glucose infusion in children.Nishina, K Mikawa, K : Maekawa, N : Shiga, M : Obara, H Anesthesiology. 1998 Apr; 88(4): 922-7
20. Oral clonidine premedication reduces minimum alveolar concentration of sevoflurane for laryngeal mask airway insertion in children. Cat.inist pediatric anesthesia ISSN 1155-5645 2006 VOL 16,834-839 Kahoru nishina MD
21. Katsuya Mikawa MD,Takanobu uesugi MD, Hidefumi obara MD Clonidine in paediatric anaesthesia: review of the literature and comparison with benzodiazepines for premedication . H. Bergendahl , P-A. Lönnqvist et al, Efficacy oral midazolam premedication in children Anesthesiology 1990 nov 73(5)
22. Feld ,Lawrence H,Negus,Jean B,White ,Paul F Satosker; Pharmacology & Pharmacotherapeutics, 18th edition Page113