A Comparison of Intranasal Dexmeditomidine versus Intranasal Midazolam as a pre Anesthetic Medication in Children Undergoing Adenotonsillectomy

Thesis

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Nourhan Mohammed Abd Allah El Zoghby

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List of Abbreviations

Abb.	Full term
ACTH	*Adrenocorticotropic hormone*
ADH	*Antiduretic hormone*
ASA	*American Society of Anesthiologists*
AVPU scale	*Alert, verbal, pain, unresponsive*
BBB	*Blood brain barrier*
BP	*Blood pressure*
CBC	*Complete blood count*
CNS	*Central nervous system*
COPD	*Chronic obstructive pulmonary disease*
CSF	*Cerebrospinal fluid*
CT	*Computerized tomography*
CVS	*Cardiovascular system*
DBP	*Diastolic blood pressure*
FDA	*Food and Drug Administration*
GABA	*Gamma aminobutyric acid*
GIT	*Gastrointestinal tract*
HCl	*Hydrogen chloride*
HR	*Heart rate*
ICP	*Intracranial pressure*
IM	*Intramascular*
IV	*Intravenous*
JCAHO	*Joint Commission on Accreditation of Health Care Organization*
KFT	*Kidney function test*

List of Abbreviations cont...

Abb.	Full term
LFT	*Liver function test*
MAP	*Mean arterial blood pressure*
MRI	*Magnetic Resonance Imaging*
NMDA	*N-methyl-D-aspartate*
OTFC	*Oral transmucosal fentanyl citrate*
PACU	*Post anasthetic care unit*
POSS	*Pasero Opioid-Induced Sedation Scale*
PRN	*Pro Re Nata*
PT	*Pothrombin time*
PTT	*Partial thromboplastin*
RASS	*Richmond Agitation -Sedation Scale*
SBP	*Systolic blood pressure*
SD	*Standard deviation*
Spo2	*Oxygen saturation*

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INTRODUCTION

Adenotonsillectomy is one of the most common surgical procedures performed on pediatric patients. Relieving pre- and post-operative anxiety is an important concern for the pediatric anesthesiologist. Anxiety can produce aggressive reactions, increase distress, and may make the control of postoperative pain difficult. Pre-anesthetic medication in children should aim at relieving this anxiety and psychological trauma and also to facilitate the induction of anesthesia without prolonging the recovery ***(Ghali et al., 2011).***

A pre-medicate drug must have an acceptable, non-traumatic route of administration in order not to add extra stress to the child. Many studies have shown that intranasal route is an effective way to administer premedication and sedation to children. It is a relatively easy non-invasive route with high bioavailability and rapid onset of action comparable to that of IV administration because of the rich blood supply of the airway mucosa and bypassing the first pass hepatic metabolism. Also, this route is not painful and does not require trained personnel ***(Wang and Bu, 2002).***

The benzodiazepine (midazolam) a GABA receptor stimulator is the most commonly used sedative drug for premedication in children. Administered intranasal, midazolam is an effective option for conscious sedation ***(Mostafa and Morsy, 2013).***

Midazolam has a number of beneficial effects when used as premedication in children: sedation, fast onset, and limited duration of action. Despite having a number of beneficial effects, it is far from an ideal pre-medicate having side effects such as restlessness, paradoxical hyperactive reaction, cognitive impairment, amnesia, and respiratory depression ***(Bergendahl et al., 2006).***

Dexmedetomidine is a newer alpha 2-agonist with a more selective action on the alpha adrenoceptor with both sedative and analgesic properties and is devoid of respiratory depressant effect. Its bioavailability is (72.6–92.1%) when administered via the nasal mucosa. These properties render it potentially useful for anesthesia premedication ***(Darshna et al., 2015).***

So considering all these aspects, the present study was planned to evaluate sedation level and ease of child parent separation, the mask tolerance, and postoperative analgesia by comparing intranasal dexmedetomidine with intranasal midazolam as premedication in pediatric patients posted for adenotonsillectomy.

AIM OF THE WORK

The purpose is to compare intranasal dexmedetomidine with midazolam effect on preoperative sedation, the ease of children parent separation, the mask tolerance, intraoperative hemodynamics stability, emergence of anesthesia and postoperative analgesia in pediatric patients posted for adenotonsillectomy.

Chapter 1
PEDIATRIC SEDATION

Premedication: is drug treatment given to a patient usually before medical or surgical procedures. The aim of premedication in children and young people is to produce a relaxed state with reduced anxiety and increased compliance, allowing the patient to tolerate and co-operate with the necessary procedure. This is commonly achieved by appropriate administration of pharmacological agents, typically sedative or analgesic. After effective premedication, patients may exhibit an altered level of consciousness but should retain the ability to independently and continuously maintain a patent airway, follow verbal commands, and respond appropriately to tactile stimulation **(Fortier et al .,2010) .**

American society of anesthiologists (ASA) and Joint Commission on Accreditation of Health Care Organization (JCAHO) divided sedation into 4 levels:

Table (1): Classification of sedation according to ASA and JCAHO

Level	Minimal sedation (Anxiolysis)	Moderate sedation (conscious sedation)	Deep sedation	General sedation
Response	- Responds normally to verbal commands	- Responds Purposefully to verbal commands alone or with light touch	- Responds Purposefully to repeated or painfull stimuli i.e cannot easily be aroused (reflex withdrawal is not considered a purposeful response)	- No response by reflex withdrawal
Airway	- Airway and ventilation are maintained.	- Airway and ventilatory pattern are maintained.	- Airway may be or may not be maintained.	- Airway is lost
CVS	-CVS function is maintained.	- CVS function is maintained.	- CVS function is usually maintained.	- CVS function may be impaired.

Indications:

1- In the emergency departments e.g fractures and lacerations.

2- Diagnostic imaging areas e.g CT scan, MRI, and barium studies.

3- GIT: Endoscopy.

4- Pulmonary: Broncoscopy.

5- CVS: Echocardiography and catheterization.

6- Burn unit: Dressings.

7- In other areas: e.g chest tube removal, bone marrow aspirations..etc.

8- Elective operations

Medications used as premedication:

Benzodiazepines:

The most commonly used sedative premedicant in the preoperative holding area is midazolam.

Lorazepam:

May be administered orally, intravenously, or intramuscularly and is metabolized by the liver to inactive metabolites. The intravenous formulation has been reported to be neurotoxic in neonates ***(Relling et al., 1989).***

Lorazepam has a slow onset and offset of action, and therefore is better used for inpatients. It has good amnestic properties and less tissue irritation than diazepam. The usual dose is 0.05 mg/kg administered orally or intravenously to older children; however a dose of 0.025 mg/kg has been adequate to decrease preoperative anxiety ***(McCall et al., 1999).***