



INTRAMUSCULAR MIDAZOLAM AND ORAL CLONIDINE AS A PREMEDICATION IN GENERAL ANAESTHESIA: A COMPARATIVE STUDY

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Conflicts of Interest: Nil

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Abstract:

Introduction: For anesthesiologists one of the challenges is to minimize psychological scaring and upset in the operating room environment and to facilitate a smooth induction of anesthesia. Anxiety and fear of operation, physicians, injections, parental separation and operation theater environment are all traumatizing experiences in postoperative maladaptive behavioral changes. During induction midazolam used as premedication showed significant reduction in dose, less airway irritability, low maintenance requirements of anesthetics and blood pressure (BP) increase. Preoperative use of clonidine has been shown to potentiate the effects of anesthetics. Midazolam is a benzodiazepine with complete absorption pattern after intramuscular (i.m.) injection and short elimination half-life. Midazolam has property to produce amnesia and Clonidine impaired sympathoadrenal responses to painful stimuli at the time of tracheal intubation or surgery and other stimuli.

Aim: The main aim is to compare the effects of Intramuscular Midazolam and Oral clonidine as premedication.

Material and Method: The present study was carried out in the department of anesthesia at Prakash Institute of Medical Science and Research. Total 50 patients were included in this study with the age range from 15 years to 60 years. Preoperative assessment was carried out of patients one day before operation. Complete history of the patients was taken and systemic examination was performed to rule out any major systemic dysfunction. Total patients were divided in two groups in which Group I Inj. Midazolam 0.07 mg/kg i.m. was used before surgery whereas in group II 2 hours before surgery orally Tab. Clonidine 4µg/kg was used. At the time of giving premedication blood pressure, Pulse rate, state of excitement, apprehension and sedation were also noted.

Result: In both the cases age group of 16-30 years (56%) have majority. According to gender wise 40% cases were males and 60% were females. Sedation score, apprehension score and excitement score before and after induction was statistically significant ($p < 0.001$). Both midazolam and clonidine caused significant reduction in propofol dose required to induce anesthesia.

Conclusion: In sedative and anxiolytic effects midazolam was found to be superior to clonidine & had better amnesia than clonidine. Dose reduction of propofol was more in clonidine group.

Keywords: Midazolam, Clonidine, Premedication, Sedative

Introduction

For anesthesiologists one of the challenges is to minimize psychological scaring and upset in the operating room environment and to facilitate a smooth induction of anesthesiaⁱ. Anxiety and fear

of operation, physicians, injections, parental separation and operation theater environment are all traumatizing experiences in postoperative maladaptive behavioral changesⁱⁱ. Premedication should make patient calm, free of anxiety and pain, sedated but it should be easily and fully co-

operative. Oral premedication is widely used in anesthesia to reduce preoperative anxiety. The prospects of sedation and analgesia provided by drug in single oral dose and excellent oral bioavailability to study its efficacy as premedication in patients and compare it with oral midazolam, a gold standard premedication in patientsⁱⁱⁱ. During induction midazolam used as premedicant showed significant reduction in dose, less airway irritability, low maintenance requirements of anesthetics and blood pressure (BP) increase^{iv}. Preoperative use of clonidine has been shown to potentiate the effects of anesthetics^v. Many anesthesiologists agree on the need for efficient premedication. Midazolam is a benzodiazepine with complete absorption pattern after intramuscular (i.m.) injection and short elimination half-life^{vi}. There are many studies among which one study shows anxiolysis without side effects after midazolam premedication as other studies reported as an effective dose of oral midazolam prolonged recovery times^{vii,viii}. Midazolam has property to produce amnesia and Clonidine impaired sympathoadrenal responses to painful stimuli at the time of tracheal intubation or surgery and other stimuli^{ix}. Therefore the mechanism of the reduction of the anesthetic requirements is unknown. It is however assumed that decrease is caused by actions on both pre- and postsynaptic α_2 -adrenoceptors in the central

nervous system^x. The main aim is to compare the effects of Intramuscular Midazolam and Oral clonidine as premedication.

MATERIAL AND METHOD:

This study was done in the department of anesthesia Prakash Institute of Medical Science and Research. Total 50 patients were included in this study with the age range from 15 years to 60 years. Preoperative assessment was carried out for patients one day prior to operation. Complete history of the patients was taken and systemic examination was performed to rule out any major systemic dysfunction. Routine investigations like urine analysis for albumin and sugar, hemoglobin estimation and X-ray chest were done. The night before operation No sedation was given. Total patients were divided in two groups in which Group I Inj. Midazolam 0.07 mg/kg i.m. was used 30 minutes before surgery whereas in group II 2 hours before surgery orally Tab.Clonidine 4 μ g/kg was used. At the time of giving premedication blood pressure, Pulse rate, state of excitement, apprehension and sedation were also noted.

RESULT:

In both the cases major age group of 16-30 years (56%) have majority. According to gender wise 40% cases were males and 60% were females as shown in table no 1 below.

Table 1: Distribution of cases with age and gender wise

Age group (years)	Midazolam			Clonidine		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
15-29	8(32)	6(24)	14(56)	8(32)	6(24)	14(56)
30-44	3(12)	5(20)	8(32)	2(8)	6(24)	8(32)
45-59	2(8)	1(4)	3(12)	2(8)	1(4)	3(12)

In both the groups showing sedation score, apprehension score and excitement score before and after induction was statistically significant (p<0.001) as shown in table 2 below.

Table 2: showing score of Sedation, apprehension and excitement score in both groups

Variables		Midazolam	Clonidine	p value
Sedation score	Before Premedication	0	0	p<0.001
	Before Induction	1.8 \pm 0.8	1.1 \pm 0.7	
Apprehension score	Before Premedication	-0.5 \pm 0.3	-0.5 \pm 0.2	p<0.005
	Before Induction	-0.1 \pm 0.3	-0.3 \pm 0.3	
Excitement score	Before Premedication	-0.5 \pm 0.3	-0.5 \pm 0.2	p<0.001
	Before Induction	-0.1 \pm 0.2	-0.3 \pm 0.3	

Both midazolam and clonidine caused significant reduction in propofol dose required to induce anesthesia. In dose requirement of propofol for induction between midazolam and clonidine group shows no significant difference as shown in table 3 below.

Table 3: Propofol dose reduction

Group	Required dose of Propofol	Given dose of Propofol	% reduction	P value
Midazolam	335.8 ± 46.8	280.0 ± 40.6	17.7 ± 3.1	<0.001
Clonidine	345.5 ± 38.4	277.8 ± 35.2	19.6 ± 4.3	<0.001

In clonidine group, in systolic blood pressure and heart rate there is statistically significant difference between before pre-medication and induction where as there is no statistically significant difference between before induction and during laryngoscopy. In Midazolam group, before pre-medication and induction no statistically significant difference between blood pressure & heart rate whereas there is significant difference in blood pressure and heart rate between before induction and during laryngoscopy.

DISCUSSION:

There are many studies demonstrated the beneficial effects of good pre-anesthetic medication and both midazolam and clonidine are effective premedications before anesthesia. Sedation and anxiolysis are the essential components of anesthesia before surgery in patients. This study observed that midazolam produced rapid and better sedation as compared to clonidine which was maintained in post-operative period. According to the study of H.Ronald et al^{xi} midazolam produced significantly better sedation than placebo. Hydroxyzine had given intramuscularly 60-90 min. before anesthesia. Another study as McAtteer et al^{xii} midazolam compared to papaveretum produced similar degree of sedation which was similar to this study. As the study conducted by J.Hargreaves at al^{xiii} and T.G. Short et al^{xiv} both the drugs midazolam and temazepam of benzodiazepam group provided similar degree of sedation similar to this study which shows midazolam had better anxiolytic effect as compared to clonidine. Midazolam was satisfactory agent for pre-medication producing

adequate anxiolysis was observed by McAteer and Dixon J. et al¹².

In this study, there was 17.7% reduction in induction dose of propofol in Midazolam group and 19.6% reduction in clonidine group which is correlated with F. Bonnet et al^{xv} which shows that clonidine does not delay recovery from anesthesia. According to the study of R. Aantaa et al Dexmedetomidine caused dose dependent decrease in recovery time after anesthesia in which this study shows to regain consciousness time needed which increased significantly after midazolam 0.08mg/kg and not after clonidine.

CONCLUSION:

In sedative and anxiolytic effects midazolam was found to be superior to clonidine & had better amnesia than clonidine. Dose reduction of propofol was more in clonidine group. Considering dosing, different route, combinations and time interval between premedication and intubation might affect the efficacy of drugs. There was no attenuation in hemodynamic response to laryngoscopy and intubation in midazolam group and there was no prolongation in recovery time in clonidine group. So it was concluded that midazolam was more potent in sedative and anxiolytic effect, however more multicenter studies are required to confirm the findings.

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