



VOMITING;

EFFECT OF ORAL KETAMINE MIXTURE WITH DEXAMETHADSONE - CHLORPHENIRAMINE ON INCIDENCE OF VOMITING ASSOCIATED WITH PREMEDICATION AFTER PEDIATRIC DENTAL PROCEDURES

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ABSTRACT... Objectives: To investigate whether the addition of dexamethasone and chlorpheniramine to oral ketamine premedication affects the incidence of postoperative vomiting. **Study Design:** Randomized control trail. **Setting:** Department of Anesthesia and Intensive Care Nishtar Hospital, Multan. **Period:** March 2016 to March 2017. **Methodology:** After obtaining ethical approval ethical and review board of hospital. Data was entered in a computer software SPSS version 23.1 and analyzed for possible variables. Continuous variables were presented as mean and standard deviation like age, weight, sedation time, anesthesia time, admission time and PACU time. Categorical variables were presented as gender, ASA status and postoperative vomiting. Student test and chi square test was applied to see association of outcome variable. P value of 0.05 was taken as significant. **Results:** Overall, 100% (n=80) patients were included in this study, both genders. The study group was further divided into two equal groups, 50% (n=40) in each, i.e. Group K (Ketamine) group and group KD (Ketamine-Dexamethasone). The main outcome variable of this study was postoperative vomiting. In this study, Postoperative vomiting observed in 35% (n=10) and 10% (n=4) patients, for group K and group KD respectively. The difference was statistically significant (p=0.007). **Conclusion:** Addition of dexamethasone and chlorpheniramine with ketamine as premedication reduce the incidence of postoperative vomiting.

Key words: Ketamine, Dexamethasone, Chlorpheniramine, Vomiting, Anesthesia. Dental Surgery.

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INTRODUCTION

In young children smooth and calm premedication and anesthesia is challenge for anesthesiologists because children are afraid of hospital staff (nurses and doctors).¹ Except few one almost all children are resistant to intravenous and intramuscular injections especially when injected forcefully. Some of them are reluctant to inhalational face mask used for oxygen delivery or inhalational anesthesia even in presence of parents.² Another critical situation is that parents don't feel comfortable in this forceful environment and refused to treat their child in this compelling behavior. These both forceful conditions induction of anesthesia and separation from their parents may cause some complications in postoperative period like nightmare.³ In this confused state premedication is best, safe and acceptable method. Among premedication Ketamine is the

drug of choice for safe and effective premedication drug. Premedication with ketamine leads the patients to dissociative state of anesthesia in which patients seems to be awake but actually not due to deep amnesia and good analgesic effect delivered by anesthetic agents given.⁴ Used of oral Ketamine have many advantages over other inhalational and intravenous anesthetics; its safe and easily accepted by the child, secondly it's Onset of action is rapid about 20 to 30 minutes.⁵ Ketamine also have advantages as it is safe for cardiorespiratory system and have no effect on airway maintenance. Nausea and vomiting in postoperative is a common adverse effect of oral Ketamine and its incidence reported 5 to 50% in previous studies.⁶ In a study conducted by Suvillian et al⁷ postoperative incidence was reported 60% when Ketamine was used in doses of 10 mg per kg. Some other side effects of

Ketamine are emergence agitation, extra salivation and laryngospasm. When we consider these side effects and their treatment, a combination of dexamethasone and chlorpheniramine is available in market with name of Vendexine syrup with suitable taste.^{8,9} This syrup available for the treatment of urticaria and bronchial asthma but it's all components are good antiemetics with safe efficacy. Dexamethasone is a glucocorticoid with antiemetic effects and chlorpheniramine is a first generation anti histamine with good antiemetic effects plus sedative.¹⁰ In this study we evaluated the efficacy of combination dexamethasone plus chlorpheniramine mixed with oral Ketamine for management of postoperative vomiting.

METHODOLOGY

This study was a randomized control trial conducted in the department of anesthesia and intensive care Nishtar hospital, Multan from March 2016 to March 2017 after obtaining ethical approval ethical and review board of hospital. Informed consent was obtained from parents of selected subjects. Non probability consecutive sampling technique was adopted study sampling and sample size was calculated from online data source openepi.com by putting the values CI 95% power of study 80% and vomiting ratio was found 9.3% in combination group of ketamine and dexamethasone plus chlorpheniramine. All children were divided into two groups (K group and KD group) by lottery method. Children of group K were given ketamine alone and in group KD were given ketamine with dexamethasone plus chlorpheniramine (Vendexine syrup). Children of age 2-6 years of age, ASA status I and II and who were selected for dental restoration were included in the study. Children with congenital anomalies of heart, mental retardation, autism, developmental problems, with history of epilepsy, organ dysfunction, previous dental surgery and chest infection were excluded from our study. Complete laboratory investigation was done like complete blood count, coagulation profile and patient was kept for NPO (nothing per oral) at least for six hours. Before surgery complete anesthesia assessment was done for all patients.

Dose of Pediatric premedication as 6 mg per kg,

0.1 mg per kg chlorpheniramine and 0.025 mg per kg dexamethasone for group KD. Ketamine HCL 6 mg per kg mixed with apple juice which matches in color with Vendexine preparation. We tested this dose in in our study. Premedication was given by a third anesthetist who was not aware of study groups. For a child having average weight of 20 kg 2.4 ml of ketamine mixed with 5ml of vendexine which give dose as above mentioned .

Data was entered in a computer software SPSS version 23.1 and analyzed for possible variables. Continuous variables were presented as mean and standard deviation like age, weight, sedation time, anesthesia time, admission time and PACU time. Categorical variables were presented as gender, ASA status and postoperative vomiting. T test and chi square test was applied to see difference of outcome variable in both groups. P value of 0.05 was taken as significant.

RESULTS

Overall, 100% (n=80) patients were included in this study, both genders. The study group was further divided into two equal groups, 50% (n=40) in each, i.e. Group K (Ketamine) group and group KD (Ketamine-Dexamethasone). Gender distribution, in group K, was observed as 52.5% (n=21) males and 47.5% (n=19) females. While, in group KD, there were 45% (n=18) males and 55% (n=22) females. The mean age, weight, adequate sedation time, anesthesia time, recovery time and PACU time of the group K patients was 2.88 ± 1.44 years, 13.40 ± 2.35 kg, and 23.40 ± 4.91 minutes, 105.22 ± 5.91 minutes, 9.35 ± 4.53 minutes and 16.58 ± 4.91 minutes respectively. While, the mean age, weight, adequate sedation time, anesthesia time, recovery time and PACU time of the group KD patients was 4.05 ± 1.10 years, 13.00 ± 1.86 kg, 23.60 ± 4.65 minutes, 104.90 ± 5.58 minutes, 8.57 ± 5.19 minutes and 16.12 ± 5.36 minutes respectively. For group K, ASA I and II observed as 87.5% (n=35) and 12.5% (n=5) respectively. While, ASA I and II observed as 97.5% (n=39) and 2.5% (n=1) respectively. Number of procedures with extractions for group k and group KD noted as 27.5% (n= 11) and 47.5% (n=19) respectively. The differences between the demographic characteristics were statistically

insignificant, in groups, except age. (Table-I).

The main outcome variable of this study was postoperative vomiting. In this study,

Postoperative vomiting observed in 35% (n=10) and 10% (n=4) patients, for group K and group KD respectively. The difference was statistically significant ($p=0.007$). (Table-II).

Characteristics	Group K* (n=40)	Group KD* (n=40)	P value
Gender	M=52.5% (n=21), F=47.5% (n=19)	M=45% (n=18), F=55% (n=22)	0.502
Age (years)	2.88±1.44	4.05±1.10	0.000
Weight (kg)	13.40±2.35	13.00±1.86	0.402
Adequate sedation time (min)	23.40±4.91	23.60±4.65	0.852
Anesthesia time (min)	105.22±5.91	104.90±5.58	0.801
Recovery time (min)	9.35±4.53	8.57±5.19	0.479
PACU* time (min)	16.58±4.91	16.12±5.36	0.697
ASA*	I=87.5% (n=35), II=12.5% (n=5)	I=97.5% (n=39), II=2.5% (n=1)	0.90
Number of procedures with extractions	27.5% (n=11)	47.5% (n=19)	0.065

Table-I. Demographic characteristics among the groups

*ASA, American Society of Anesthesiologists; K, ketamine; PACU, post-anesthesia care unit; KD, ketamine-Dexamethasone. $P<0.05$ is considered

Characteristics	Group K* (n=40)	Group KD* (n=40)	Test of Sig.
Postoperative vomiting	35% (n=10)	10% (n=4)	$\chi^2=7.17$, $p=0.007$

Table-II. Emergence of postoperative vomiting in groups

*K, ketamine, KD, ketamine-Dexamethasone

DISCUSSION

Use of oral ketamine for safe anesthesia in children is an effective and favorite premedication but its adverse effect of vomiting in post operative period is an enigma for anesthesiologists.¹¹ In present study we tested a modified premedication in which ketamine was given in combination with dexamethasone and chlorpheniramine to overcome this side effect. After use of this premedication we observe only 10% vomiting in pos operative time mean while in ketamine alone 35% patients face this complication.

Gutstein et al¹² conducted a study in 1992 and compared 6 mg and 3 mg/kg ketamine as premedication in his study and reported that use of 6 mg ketamine as premedication reduce the vomiting and other postoperative complications. After oral anesthetic dose it is easy to separate children from their parents for surgery. Oral ketamine is a drug of choice for anesthesia in children.

Alfonzo-Echeverri EC et al¹³ conducted a

study on oral ketamine use of premedication for anesthesia in children and reported high incidence of vomiting in postoperative period. He reported 20-40% cases of vomiting in this period. Similar study was conducted by Sekerci C et al¹⁴ and reported similar finding as high incidence of nausea and vomiting in postoperative period. In our study we observed 35% vomiting cases in ketamine alone group. Results of our study were almost identical to these to studies.

In our study we compare ketamine alone with ketamine and dexamethasone plus chlorpheniramine as additional drugs to overcome problem of postoperative vomiting. A similar study was conducted by Abdellatif AA et al⁹ in 2016 and reported that dexamethasone and chlorpheniramine are effective medicines when used with ketamine at the time of anesthesia in children for control of vomiting after surgery. He reported 10% vs 37.5% vomiting respectively in ketamine alone vs ketamine with dexamethasone plus chlorpheniramine. Finding of this study are comparable with our study.

Another study conducted by Issabeagloo E et al¹⁵ on use of ketamine and chlorpheniramine through oral and sublingual route and reported that there was not significant incidence of vomiting and salivation. Another aspect of this study was that it was conducted on animal population not in humans. This study is also comparable with our study and favors our findings.

Another study was conducted by Bui T et al¹⁶ on this similar topic but he use another antihistamine in place of chlorpheniramine as adjuvant to ketamine. He used promethazine and reported remarkable decrease (0 to 20%) in incidence of vomiting in postoperative period. Results of this study were also similar to our results and findings favor our study. Half life of ketamine is 8 to 12 hours reported in literature.^{17,18}

Dose of ketamine was reported 3 to 10 mg/kg for sedation and its use vary with increase in doses of ketamine.^{19,20} Adverse effects of its use were also changes with change of its doses. In our study we use its fix dose so this variable is not assessed in our trial.

CONCLUSION

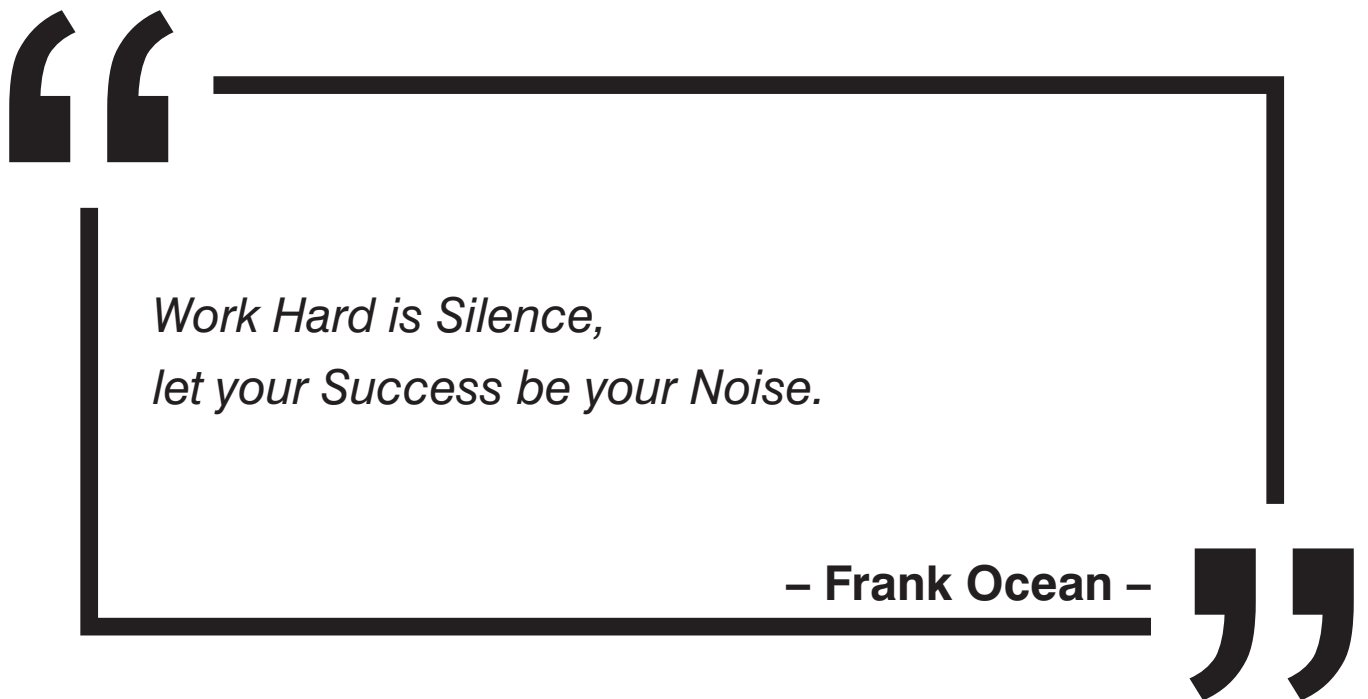
Addition of dexamethasone and chlorpheniramine with ketamine as premedication reduce the incidence of postoperative vomiting after dental surgical procedures.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Malik Jamil Ahmed	Conceived idea, Study design.	
2	Muhammad Nasir	Data collection, Literature review.	
3	Aamir Furqan	Manuscript writing, Data analysis.	