**Original article:**

# Evaluation of Effect of Propofol-Ketamine and Propofolin Patients Undergoing Ambulatory Surgery: A Comparative Study

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## ABSTRACT

**Background:** Ketamine and propofol are the routinely used analgesic drugs in patients undergoing surgical procedures. Several studies have been shown that ketamine seem to be acceptable drugs for use during assisted reproduction.Hence; we planned the present study to assess and compare the effect of Propofol-Ketamine and Propofol in patients undergoing Ambulatory Surgery.

**Materials & Methods:** The present study included assessment and comparison of efficacy of Propofol-Ketamine and Propofol in patients undergoing Ambulatory Surgery. A total of 50 patients were included in the present study.All the patients were broadly divided into two study groups; Group I included subjects who were given admixture of propofol and 0.5% ketamine, while Group II included subjects who were given admixture containing propofol and lignocaine. All the results were analyzed by SPSS software.

**Results:** Significant results were obtained while comparing the mean induction dose in subjects of both the study groups. Mean induction dose required was significantly in subjects of group II.

**Conclusion:**Combination of propofol-ketamine when compared to the use of propofol alone gives better efficacy.

**Key words:**Ambulatory Surgery, Ketamine, Propofol.

## INTRODUCTION

Ketamine is a unique agent in procedural sedation and analgesia (PSA) in that it is a “dissociative” anesthetic that functions by blocking communication between the thalamic and limbic regions of the brain, thereby preventing the brain from processing external stimuli.[1-4] Propofol is a non-barbiturate sedative hypnotic developed in Europe in the 1970s and was gradually utilized by anesthesiologists in the United States over the next two decades. Relatively recently its use has spread into the Emergency Department (ED) as a part of PSA. Its popularity as a PSA agent is growing rapidly due mainly to its favorable pharmacokinetic profile as the lipid solubility confers a quick onset and short recovery time.[5-7] It also has the advantages of functioning as an antiemetic, an anticonvulsant, and an amnestic agent. Although extremely effective and potent, propofol use is limited by a relatively high incidence of dose-dependant hypotension and respiratory depression.[8] Literature quotes paucity of data comparing the pharmacological effect of admixtures of these drugs with individual drugs. Hence; we planned the present study to assess and compare the effect of Propofol-Ketamine and Propofol in patients undergoing Ambulatory Surgery.

**MATERIALS & METHODS**

The present study was conducted in the department of pharmacology and anaesthesia of the ChalmedaAnandRao Institute of Medical Sciences, Karimnagar, Andhra Pradesh (India) and included assessment and comparison of efficacy of Propofol-Ketamine and Propofol in patients undergoing Ambulatory Surgery. A total of 50 patients were included in the present study. Only those patients were included in the present study who were planned to undergo urogynaecological procedures on a day case basis. Ethical approval was taken from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Exclusion criteria for the present study included:Patients with history of any systemic illness,Patients less than 18 years of age,Patients on any form of psychotropic or opioid medication in the preceding 48 hours,Patients with any known drug allergy All the patients were broadly divided into two study groups; Group I included subjects who were given admixture of propofol and 0.5% ketamine, while Group II included subjects who were given admixture containing propofol and lignocaine. Injection of the admixture drugs was given at the rate of 0.4ml/ second. All the patients were closely monitored for alteration of any hemodynamic parameter. Discontinuation of the drug was done at the end of the procedure. Calculation of recovery time and side-effect, if present, was done. All the results were analyzed by SPSS software. Chi- square test and student t were used for assessment of level of significance. P- value of less than was taken as significant.

**RESULTS**

Mean age of subjects of Group I and Group II was 40.55 and 39.25 years respectively as shown in Table 1. Mean weight of subjects of group I and Group II was 51.2 and 50.6 kg respectively. Mean duration of procedure of group I and Group II included 19.5 minutes and 20.1 minutes respectively. Significant results were obtained while comparing the mean induction dose in subjects of both the study groups (P- value < 0.05).

**DISCUSSION**

In the present study, we observed that mean induction dose required in the anaesthetic procedure was significantly higher in subjects of group II in comparison to subjects of group I (P-value < 0.05) (Table 2).Willman EV evaluated the effectiveness and consider the safety of intravenous ketamine/propofol combination ("ketofol") in the same syringe for procedural sedation and analgesia in the emergency department (ED). They studied a case series of consecutive ketofol procedural sedation and analgesia events in the ED of a trauma-receiving community teaching hospital. Patients of all ages, with any comorbid conditions, were included. Ketofol (1:1 mixture of ketamine 10 mg/mL and propofol 10 mg/mL) was administered intravenously at the discretion of the treating physician by using titrated aliquots. The presence or absence of adverse events was documented, as were procedural success, recovery time, and physician, nurse, and patient satisfaction. Physiologic data were recorded with established hospital procedural sedation and analgesia guidelines. One hundred fourteen procedural sedation and analgesia events using ketofol were performed for primarily orthopedic procedures. The median dose of medication administered was ketamine at 0.75 mg/kg and propofol at 0.75 mg/kg (range 0.2 to 2.05 mg/kg each of propofol and ketamine; interquartile range [IQR] 0.6 to 1.0 mg/kg). Procedures were successfully performed without adjunctive sedatives in 110 (96.5%) patients. Three patients (2.6%; 95% confidence interval [CI] 0.6% to 7.5%) had transient hypoxia; of these, 1 (0.9%; 95% CI 0.02% to 4.8%) required

bag-valve-mask ventilation. Four patients (3.5%; 95% CI 1.0% to 8.7%) required repositioning for airway malalignment, 4 patients (3.5%; 95% CI 1.0% to 8.7%) required adjunctive medication for sedation, and 3 patients (2.6%; 95% CI 0.6% to 7.5%) had mild unpleasant emergence, of whom 1 (0.9%; 95% CI 0.02% to 4.8%) received midazolam. No patient had hypotension or vomiting or received endotracheal intubation. Median recovery time was 15 minutes (range 5 to 45 minutes; IQR 12 to 19 minutes). Median physician, nurse, and patient satisfaction scores were 10 on a 1-to-10 scale. Ketofol procedural sedation and analgesia is effective and appears to be safe for painful procedures in the ED. Few adverse events occurred and were either self-limited or responded to minimal interventions. Recoveries were rapid, and staff and patients were highly satisfied.[9]Slavik VC et al examined the current evidence for the efficacy and safety of ketamine and propofol in combination for procedural sedation and analgesia, we searched the MEDLINE (1966-March 2007), EMBASE (1980-March 2007), and Cochrane Database of Systematic Reviews (through the first quarter of 2007) databases for reports describing the use of ketamine and propofol in combination for procedural sedation and analgesia. Additional published reports were identified through a manual search of references from retrieved articles. Prospective, comparative, full-text reports of studies performed in humans that were published in English were reviewed for inclusion. Both authors independently evaluated all studies. Studies in adult and pediatric patients were included if they evaluated efficacy or safety end points. Eight clinical trials were included, seven of which compared a combination of propofol and ketamine with propofol monotherapy. In these trials, variable milligram:milligram ratios of propofol and ketamine were used, ranging from 10:1-2:1, and the optimum dose of these agents in combination is unclear. Combination propofol and ketamine has not demonstrated superior clinical efficacy compared with propofol alone for procedural sedation and analgesia. Conflicting data exist regarding reduced hemodynamic and respiratory complications in patients receiving the combination compared with propofol monotherapy. At higher doses, the addition of ketamine to propofol may incur more adverse effects. Compatibility data for the two agents combined in a syringe are limited. The available evidence does not support the use of a fixed-dose ketamine-propofol combination for procedural sedation and analgesia.[10] Tosun Z et al compared the clinical efficacy and safety of propofol-ketamine with propofol-fentanyl in pediatric patients undergoing diagnostic upper gastrointestinal endoscopy (UGIE). Ninety ASA I-II, aged 1 to 16-year-old patients were included in the study. Heart rate (HR), systolic arterial pressure, peripheral oxygen saturation, respiratory rate (RR) and Ramsey sedation scores of all patients were recorded perioperatively. Patients were randomly assigned to receive either propofol-ketamine (PK; n = 46) or propofol-fentanyl (PF; n = 44). PK group received 1 mg x kg(-1) ketamine + 1.2 mg x kg(-1) propofol, and PF group received 1 microg x kg(-1) fentanyl + 1.2 mg x kg(-1) propofol for sedation induction. Additional propofol (0.5-1 mg x kg(-1)) was administered when a patient showed discomfort in either group. The number of patients who needed additional propofol in the first minute after sedation induction was eight in Group PK (17%), and 22 in Group PF (50%) ($P < 0.01$) and those who did not need additional propofol throughout the endoscopy were 14 in Group PK (30%) and three in Group PF (7%) ($P < 0.01$). HR and RR values after induction in Group PF were significantly lower than Group PK

(P < 0.01). Both PK and PF combinations provided effective sedation in pediatric patients undergoing UGIE, but the PK combination resulted in stable hemodynamics and deeper sedation though more side effects.[11]

**CONCLUSION**

From the above results, the authors concluded that use of combination of propofol-ketamine when compared to the use of propofol alone gives better efficacy. However; future research is recommended.

**Table 1: Comparison of demographic details of subjects of both the study groups**

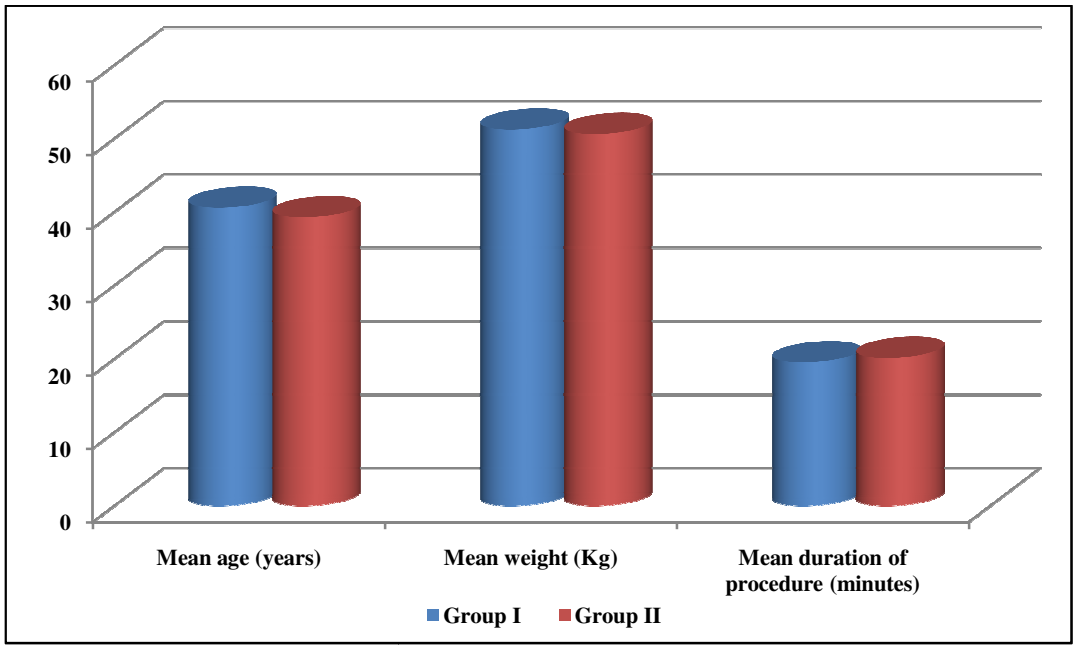
| Parameter | Group I | Group II |
|---|---|---|
| **Mean age (years)** | 40.55 | 39.25 |
| **Mean weight (Kg)** | 51.2 | 50.6 |
| **Mean duration of procedure (minutes)** | 19.5 | 20.1 |

**Table 2: Comparison of induction dose in subjects of both the study groups**

| Group | Bolus dose (ml) | Total top up dose | P- value |
|---|---|---|---|
| **I** | 14.1 | 12.1 | 0.02* |
| **II** | 16.2 | 15.9 | |

*: Significant

**Graph 1: Comparison of demographic details of subjects of both the study groups**

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