



## PROPOFOL – KETAMINE VERSUS PROPOFOL – FENTANYL FOR OUT PATIENT LAPAROSCOPY AND COMPARISON OF POST OPERATIVE NAUSEA, EMESIS ANALGESIA AND RECOVERY.

**DR.R.KONDA REDDY**

ASSOCIATE PROFESSOR OF ANAESTHESIA, KURNOOL MEDICAL COLLEGE, KURNOOL

**DR.K.ANITHA**

ASSISTANT PROFESSOR OF ANAESTHESIA, KURNOOL MEDICAL COLLEGE, KURNOOL

**ABSTRACT**

**Aims:** To compare post operative nausea, emesis, analgesia and recovery between propofol – ketamine versus propofol – fentanyl for out patient laparoscopy tubal ligation. **Study:** Prospective randomized blinded study. **Methods:** Measurable variables included total dose of Ketamine, Fentanyl, Propofol and operating time. Vital signs, pain, visual analog scale scores (VAS), presence of emesis, treatment for nausea & vomiting, pruritis, sedation & presence of dreaming were recorded on post anaesthetic care unit (PACU) admission, PACU discharge, Stepdown unit admission and Hospital discharge. Results are expressed as means  $\pm$  SD on Medians & analysed using t-test, chi square test. **Results:** No difference was noted with respect to propofol dose, operating time, pain or nausea VAS scores, Emesis, treatment for nausea & vomiting pre & sedation on PACU admission, PACU discharge, stepdown unit admission and Hospital discharge. The Ketamine group had a higher heart rate, required more pain medication and had a higher frequency of dreaming on PACU admission than the Fentanyl group. These differences became insignificant on PACU discharge. **Conclusions:** For out patient Laparoscopic tubal ligation Propofol – Ketamine does not improve post operative nausea, emesis, analgesia or recovery compared with the Propofol – Fentanyl combination.

**KEYWORDS**

Intravenous sedation, Ketamine, Propofol, Fentanyl, Laparoscopic sterilization.

**INTRODUCTION**

Laparoscopic sterilization in females offers many advantages such as reduced postoperative pain and

Shortened hospital stay, and is being increasingly performed on an ambulatory basis. In this era of health care cost containment, it is important that anesthetic drugs used for out-patient ambulatory surgery have rapid emergence, less post-operative nausea vomiting (PONV), adequate analgesia, and quick recovery. Drugs used should provide an adequate level of sedation while minimizing pain, anxiety, and the potential for adverse drug-related events, maximizing amnesia, and maintaining a stable cardiovascular and respiratory status. Unfortunately, at present, no single agent exists that has

all of the aforementioned qualities, so physicians must use combinations of different drugs at varying doses to achieve as many of the desired goals as possible. The present study was planned to comparatively evaluate postoperative recovery characteristics, duration of hospital stay, patient comfort and acceptability between ketamine-propofol and fentanyl-propofol for PSA in patients undergoing laparoscopic tubal ligation.

**METHODS:**

The present study was approved by Hospital Ethical Committee and a written informed consent was obtained from patients. A total of 50 patients of ASA grade 1 who were undergoing laparoscopic tubal ligation of duration varying from 30 – 40 minutes are included in the study. Patients of age group 24 – 30 years and weight ranging from 45 – 55 kgs at Government General Hospital Kurnool. The Modified Pomeroy procedure was used for tubal ligation. No local anaesthetics were injected into the operative site during the procedure. Patients were randomized into 2 groups. Group A received Propofol 2mg/kg and Ketamine 1.0mg/kg and Group B received Propofol 2mg/kg and Fentanyl 2ug/kg. Intraoperatively heart rate, NIBP, SPO<sub>2</sub>, ETCO<sub>2</sub> and ECG monitored till the end of the procedure. Patient was put on 4l/mt O<sub>2</sub> via Hudson mask and was transferred to the PACU for further

observation after the surgery. In the PACU the patient is observed for any pain with visual analog score, nausea & vomiting by visual analog score (VAS 100mm sliding scale), sedation graded by rousable, not fully awake & alert. Post operative medications used for treatment of Pain & PONV were recorded when given in 0 – 1 hr, 1 – 2 hr, 2 – 3 hr, 3 – 4 hr, study criteria used for administration of post operative analgesics in presence of moderate to severe pain, study criteria used for administration of post operative antiemetics in the presence of mild to severe nausea and/or emesis.

**OBSERVATIONS:**

There were no statistically significant difference between the groups with respect to patients characteristics, type of surgery and duration of surgery. No differences between groups were noted with respect to age, weight and propofol dose.

Both the groups were observed for differences in pulse rate, blood pressure & respiratory rate pre-operatively and intra-operatively. There was statistically significant increase in pulse rate & mean arterial pressure in propofol – ketamine group compared to propofol – fentanyl group. Mean arterial pressure  $P = (t = 2.668, df = 45.773, p = 0.01)(p < 0.05)$  and Pulse rate  $p = 0.001(p < 0.05)$  ( $t = 5.909$  degree of freedom 47.646,  $p + 0.001$ ).

The ETCO<sub>2</sub> was monitored throughout the procedure and was within the normal limits.

The incidence of postoperative pain, nausea, emesis, sedation, dreaming & medication given for pain, nausea, emesis during the first 4 hours periods were noted along with mean arterial pressure, pulse rate & respiratory rate.

The mean arterial pressure is increased in 0 – 1 hrs  $t = 3.551$ , degree of freedom = 41.243  $P = 0.001 (< 0.05)$  and Pulse rate in 0 – 1 hr  $t = 4.996$  degree of freedom = 42.761  $P = 0.001 (< 0.05)$  in propofol – ketamine group compared to propofol – fentanyl group.

The incidence of pain in first 4 hours in postoperative period is not statistically significant in both the propofol – ketamine & propofol – fentanyl group.

The pain relief by medication given in propofol- ketamine group in 0 – 1 hr ( Chi square test = 3.571 ,degree of freedom =1 ,P= 0.049 (p , 0.05) is increased than in propofol – fentanyl group .

The incidence of nausea is 8% , 12%, 4% and 4% in first 4 hrs in propofol – ketamine group than in propofol – fentanyl group 4%, 16%, 4.2% and 0% which shows increased emesis in first hour in propofol –ketamine group but is statistically insignificant P=0.552(P> 0.05).

The incidence of emesis is 0%,12%,8%,0% in 0-1hr, 1-2hr, 2-3hr, 3-4 hrs respectively in propofol-ketamine group and 4%, 8%, 4.2%, 0% in propofol – fentanyl group and is statistically insignificant(P> 0.05).

**Table – 1 NAUSEA**

	NAUSEA				
	Group A		Group B		P value
	No	%	No	%	
0 – 1 hr	2	8%	1	4%	0.552
1 – 2 hr	3	12%	4	16%	0.684
2 – 3 hr	1	4%	1	4.2%	0.976
3 – 4 hr	1	4%	0	0%	0.312

**Table - 2 EMESIS**

	EMESIS				
	Group A		Group B		P value
	No	%	No	%	
0 – 1 hr	0	0%	1	4%	0.149
1 – 2 hr	3	12%	2	8%	0.637
2 – 3 hr	2	8%	1	4.2%	0.576
3 – 4 hr	0	0%	0	0%	

**Table – 3 SEDATION**

	SEDATION				
	Group A		Group B		P value
	No	%	No	%	
0 – 1 hr	10	40%	9	36%	0.771
1 – 2 hr	1	4%	0	0	0.312
2 – 3 hr	0	0	0	.0	-
3 – 4 hr	0	0	0	0	-

The treatment given for nausea & emesis is 28%, 24%, 12%, 0% in propofol –ketamine group than in propofol – fentanyl group 16%, 20%, 16.7% 0% in 0-1hr, 1-2hr, 2-3hr, 3-4 hrs , comparatively more in propofol –ketamine group but is statistically insignificant (P. 0.05).

The incidence of Sedation in propofol – ketamine is 40%,4%, 0% and 0% and is 36% ,0%, 0% ,and 0% in propofol – fentanyl group in 0-1hr, 1-2hr, 2-3hr, 3-4 hrs , comparatively more in propofol –ketamine group but is statistically insignificant .

The incidence of Dreaming in propofol – ketamine is 20%,12%, 4% and 0% and in propofol – fentanyl group 4% ,0%, 0% ,and 0% where there is increased dreaming in propofol – ketamine group compared to propofol – fentanyl group p= 0.08 and there is a trend in between the groups.

Complications like pneumoperitoneum are not seen during and after the procedure. Complaints of pruritis is not observed in both the groups postoperatively.

## DISCUSSION :

Nausea and vomiting following IV general anaesthesia has been a distressing problem for the patients and is frequently

listed among the most important preoperative concerns apart from pain. With the change in emphasis from inpatient to outpatient office based medical/surgical environment , there has been increasing interest in the “ big little problem” of postoperative nausea and vomiting following laparoscopic surgeries.

Inspite of so much advancement in the management of post-operative nausea and vomiting with the invention of new drugs,multimodal approaches of management like administering multiple different antiemetic medications, less emetogenic anaesthetic techniques ,adequate intravenous hydration, adequate pain control etc., the incidence of postoperative nausea and vomiting remains still high ranging from 25% - 55% following inpatient surgery and 8% -47% following outpatient surgery.

The goals of outpatient ambulatory anaesthesia include a rapid and smooth induction, effective intraoperative anaesthesia, and a smooth and prompt recovery with minimal, if any ,post-operative side effects ,leading to a quicker return to “ home readiness ” and an overall shorter outpatient stay.

Most of the major complications of female sterilization result from general anesthesia or from heavy sedation during local anesthesia. Since general anesthesia is known to be responsible for at least one-third of all the deaths associated with sterilization. Goals of IV Sedation include providing an adequate level of sedation while minimizing pain, anxiety, and the potential for adverse drug-related events, maximizing amnesia, and maintaining a stable cardiovascular and respiratory status.

Vallejo *et al.* compared postoperative nausea, emesis ,analgesia, and recovery between the propofol–ketamineand propofol–fentanyl in outpatient laparoscopic tubal ligation done under general anesthesia. The authors observed no differences with respect to operating times,pain, nausea and vomiting or its treatment, Visual Analog Scale scores, pruritis, and sedation on PACU admission,PACU discharge, and hospital discharge between the two groups. The ketamine group had a higher heart rate,required more pain medication, and had a higher frequency of dreaming on PACU admission than the fentanyl group.These differences became insignificant on discharge. The authors concluded that propofol–ketamine did not improve postoperative nausea, emesis, analgesia, or recovery,compared with the propofol–fentanyl combination.

Akin *et al.* compared a combination of propofol and fentanyl with propofol and ketamine, but in 40 adult patients undergoing endometrial biopsy. They observed that there was no difference in the recovery times, but the discharge was delayed in the ketamine group. The longer discharge time with ketamine was caused by the higher frequency of vertigo, nausea, and visual disturbances. With regard to patient satisfaction, the propofol–fentanyl group was superior.

Badrinath *et al.* investigated the combination of propofol with ketamine at various doses in patients undergoing breast biopsy with local anesthesia. They added 2.5 lg of sufentanil depending on the discomfort and pain experienced by the patient. They also observed that the increased frequency of nausea, vomiting, and visual disturbances due to ketamine prolonged the time to discharge.

Jackobson *et al.* used four different drug combinations in patients undergoing termination of pregnancy and reported that propofol–ketamine combination led to the highest frequency of postoperative pain, psychomimetic side effects, and emesis. Although ketamine did not delay discharge, they concluded that propofol–fentanyl was the most suitable combination.

Daabiss *et al.* conducted a study to evaluate the effectiveness of different concentrations of propofol–ketamine in children scheduled for procedural operations. They found delayed

recovery and discharge time in patients with higher doses of ketamine due to incidence of clinically significant psychomimetic effects and delayed cognitive function recovery.

### Conclusion :

The present study aimed at the beneficial affects of propofol fentanyl combination to propofol ketamine group. Group A received of propofol ketamine and Group B received of propofol fentanyl. There was more stable haemodynamic picture in Group B when compared to that of Group A . There is no much difference in the respiratory rates in between the groups. Postoperatively there was more pain, sedation , dreaming in Group A in 0 – 1 hr compared to Group B and there is no much difference in postoperative nausea and vomiting in both the groups. In conclusion for outpatient laparoscopic tubal ligations intravenous propofol fentanyl combination proved to be better than propofol ketamine group in relation to postoperative analgesia, nausea, emesis and recovery.

### REFERENCES

1. Arora S. Combining ketamine and propofol (ketofol) for emergency department procedural sedation and analgesia: A review. *West J Emerg Med* 2008;9:20-3. | 2. Aldrete JA. The post-anesthesia recovery score revisited. *J Clin Anesth* 1995;7:89-91. | 3. Chung F. Recovery pattern and home readiness after ambulatory surgery. *Anesth Analg* 1995;80:896-902. | 4. Akin A, Guler G, Esmaglu A, Bedirli N, Boyaci A. A comparison of fentanyl-propofol with a ketamine-propofol combination for sedation during endometrial biopsy. *J Clin Anesth* 2005;17:187-90. | 5. Vallejo MC, Romeo RC, Davis DJ, Ramanathan S. Propofol-ketamine versus propofol-fentanyl for outpatient laparoscopy: Comparison of postoperative nausea, emesis, analgesia, and recovery. *J Clin Anesth* 1993;5:64-8. | 6. Badrinath S, Avramov MN, Shadrack M, Witt TR, Ivankovich AD. The use of a ketamine-propofol combination during monitored anesthesia care. *Anesth Analg* 2000;90:858-62. | 7. Jacobson J, Oddby E, Rane K. Patients evaluation of four different combinations of intravenous anesthetics for short outpatient procedures. *Anesthesia* 1993;48:1005-7. | 8. Daabiss M, Elsherbiny M, AlOthibi R. Assessment of different concentration of ketofol in procedural operation. *Br J Med Pract* 2009;2:2731. | 9. Anaesthetist 1990 dec 39 (12) 609-616 ; the effect of propofol – ketamine anaesthesia on haemodynamics & analgesia in comparison with propofol – fentanyl. Mayer M, Ochmann D , Doerike A, Angiter R, Sultmann H. | 10. Dae –Voo Kim et al, Comparison of sedation quality, side effects and recovery profiles of propofol alone, propofol – fentanyl and propofol –ketamine for monitored anaesthesia care. | 11. J. Clin. Anaesthesia 2002 sep 14 (6) 426 – 431 :- Propofol ketamine versus propofol fentanyl for outpatient laparoscopy comparison of postoperative nausea, emesis, analgesia & recovery. VallejoMC,Romeo RC, Davis DJ, Ramanath S. | 12. Zeynep Toswur, Recep Aksu, Gulen Gulen: propofol ketamine versus propofol fentanyl for sedation during pediatric upper GI endoscopy. | 13. Ravindra v Prasad et al University of North Carolina " Ketamine and Propofol in combination for sedation during laparoscopic tubal ligation", concluded that combination of ketamine and propofol reduced requirements as well the need for supplementation with Nitrous oxide. | 14. *Acta anaesthesiol Scand* 2005 March 49 (3) 305-311 ,less postoperative nausea and vomiting after propofol and remifentanyl versus propofol – fentanyl anaesthesia during plastic surgery. | 15. Hui T et al anaesthesia volume 82 (3) 1995 ,Additive interactions between propofol and ketamine when used for anaesthesia induction in female patients. |