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A COMPARATIVE STUDY OF KETOFOL (KETAMINE AND PROPOFOL) WITH PROPOFOL ALONE FOR RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

Dr. Priyanka Thakur[1], Dr. Prteet Negi[2], Prof. Dr. Ajay Sood[3], Dr. Aparna Sharma[4]
[1] MD, Department of Anaesthesia, Indira Gandhi Medical College, Shimla, H.P., India
[2] MS, Department of General Surgery, Dr. Rajender Prasad Medical College Kangra, Tanda H.P., India
[3] MD, Department of Anaesthesia, Indira Gandhi Medical College, Shimla, H.P., India
[4] MD, Department of Anaesthesia, Indira Gandhi Medical College, Shimla, H.P., India

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Corresponding author: Dr. Prteet Negi
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Abstract
Background: To compare the recovery in ketofol (ketamine and propofol) with propofol alone for vas in patients undergoing laparoscopic cholecystectomy
Methods: Prospective, randomized, double blinded controlled trial. After approval by the research ethics committee and written informed valid consent of the patients, the proposed study was carried out for a period of one year in 60 patients , in ASA-I and ASA-II patients, aged between 19 to 60 years of either sex, who were posted for laproscopic cholecystectomy surgery at Indira Gandhi Medical College, Shimla.
Results: Recovery profile was statistically significant for two groups. In group P after stopping infusion ,mean time for eye opening was 8.27 ± 1.28 which was less than group K (12.53 ± 1.48). Mean time of response to verbal command in group P(8.4 ± 1.19) was less than group K (12.5 ± 1.46) and mean time of extubation in group P (9.5 ± 1.25) was also less than group K (14.33 ± 1.52).
Conclusion- Patients of Group P after stopping of infusion took less time for eye opening, obeying verbal command and also less time for extubation in comparison to group K .
Keywords: Recovery, Propofol, Ketamine

Introduction:

Ketamine is an intravenous anaesthetic developed in 1960s from its precursor phencyclidine and its mode of action is causing dissociative anaesthesia rather than generalized depression of CNS, through NMDA receptor antagonism. Several advantages have been attributed to ketamine starting from its analgesic effect, amnesia, maintenance of muscle tone, protecting airway reflexes and spontaneous respiration.[1-3] Its analgesic effect may arise from multiple pathways: decreased connectivity in regions of the pain matrix responsible for the perception of pain and the affective processing of the pain, therefore ketamine provides important postoperative analgesia. The plasma level at which pain thresholds are elevated is 0.1 microgram/ml or greater, this means that a considerable period of postoperative analgesia occur after ketamine general anaesthesia, and subanesthetic doses can consequently be used to produce analgesia. Concomitant administration of benzodiazapines may prolong the effect of ketamine.

Being bronchial muscle relaxant it is drug of choice for induction of anaesthesia in patient with reactive airway disease. As it improve pulmonary compliance it is used in bronchospasm. Ketamine appears to stimulate the sympathetic nervous system leading to increased cardiac output, tachycardia and increased blood pressure. Therefore, it should be used with caution in those with ischaemic heart disease. The exact mechanism of this is not known; however, it is proposed that ketamine may inhibit reuptake of circulating catecholamines. It has been noted in patients with chronic catecholamine depletion, such as the critically ill, that ketamine alone actually produces a negative inotropic effect. In patients with normal autonomic control the direct negative inotropic effect is often overridden by the central sympathetic response[10], producing an overall increase or maintenance of blood pressure[11]. As far as laparoscopic procedures are concerned, ketamine may appear to assure adequate levels of analgesia and overcome the danger of postoperative opioid-related respiratory depression.

Material and methods

Study Design: Prospective, randomized, double blinded controlled trial. After approval by the research ethics committee and written informed valid consent of the patients, the proposed study was carried out for a period of one year in 60 patients, in ASA-I and ASA-II patients, aged between 19 to 60 years of either sex, who were posted for laproscopic cholecystectomy surgery at Indira Gandhi Medical College, Shimla.

Exclusion Criteria: patient's refusal, uncontrolled hypertension, laproscopic cholecystectomies converted to open cholecystectomies, drug allergy.

The patients were randomized into two groups:

Group P: Patients received Propofol for induction and maintenance of anaesthesia

Group KP: Patients received combination of Ketamine and Propofol for induction and maintenance of anaesthesia.

The study drug infusion was prepared by an anaesthesiologist who did not participate in collection of data in that study. Anaesthesiologist who collected data, the operating surgeon and the patient were blinded to drug infusion.

Patient recruitment into the study

All patients underwent a routine pre-anaesthetic check up. During this, thorough history and general physical examination of the patient was carried out. Routine investigations such as haemoglobin, fasting or random blood sugar, blood urea, serum creatinine, serum electrolytes, ECG and chest X-ray were documented.

Study protocol was explained to all the patients during pre-anaesthetic evaluation and informed consent was taken and signed.

The patients were made familiar with visual analogue score, VAS (0 for no pain and 10 for the worst imaginable pain).The patient was instructed for a fasting period of 6 hrs. Tablet Alprazolam was advised to patient as per department protocol.

Study Drug:

For induction of anaesthesia: Study drug was given slowly till loss of verbal response

For maintenance of anaesthesia: Study drug was infused at a rate of 50 mcg/kg/min for 10 min and then 25 mcg/kg/min.

Study Drug Preparation:

In a 50ml syringe- 50 ml study drug was loaded

- Group P: 50 ml of Propofol 1% (10mg/ml). [1ml of study drug was containing Propofol 10mg]
- Group KP: 40 ml of Propofol 1% (10mg/ml) + 10 ml of Ketamine (10mg/ml).

Results

The socio-demographic variable in both groups were comparable.

Table 1: Comparison of Recovery between two groups

Recovery of each parameter with respect to Time of stopping infusion	Group –P (n=30)	Group –K (n=30)	$\|t\|_{cal}$	p-value	Results
	Mean ± S.D (min)	Mean ± S.D (min)			
Time of eye opening	8.27 ± 1.28	12.53 ± 1.48	11.124	<0.0001	significant
Time of response to verbal command	8.4 ± 1.19	12.5 ± 1.46	11.923	<0.0001	significant
Time of extubation	9.5 ± 1.25	14.33 ± 1.52	13.433	<0.0001	significant

Recovery profile was statistically significant for two groups. In group P after stopping infusion ,mean time for eye opening was 8.27 ± 1.28 which was less than group K (12.53 ± 1.48). Mean time of response to verbal command in group P(8.4 ± 1.19) was less than group K (12.5 ± 1.46) and mean time of extubation in group P (9.5 ± 1.25) was also less than group K (14.33 ± 1.52).

Discussion

In our study patients of Group P after stopping of infusion took less time for eye opening (8.27±1.28) as compared to group K (12.53±1.48).Also time of obeying verbal command was early in group P(8.4±1.19) as compared to ketofol (12.5±1.46) and extubation was also early in group P (9.5±1.25) in comparison to group K (14.33±1.52). This recovery time for all parameters was significantly short on group P as compared to group K.

In a study conducted by Bajwa et al.[4], two drug combinations of TIVA using propofol– ketamine and propofol– fentanyl were studied for the induction, maintenance and recovery characteristics in order to find the ideal anaesthetic agent. Similar to our study they found early wakefulness in PF group and no major adverse effects of the drugs.

Ferguson I et al.[5] did a study on 573 adults from three emergency departments where prior to a painful procedure either ketofol (a 1:1 mixture of ketamine and propofol) or propofol was given .It was found that recovery was shorter with propofol, by a median of 9 minutes as compared to ketofol group which was in accordance with our study.

Rabie Soliman et al .[6] did a study which included sixty patients, classified into two groups (n = 30). Group A: Propofol was administered as a bolus dose (1–2 mg/kg) and then a continuous infusion of 50–100 μg/kg/min titrated as needed. Group B: Ketofol was administered 1–2 mg/kg and then infusion of 20–60 μg/kg/min. It was reported that the durations of full recovery and stay in the postanesthesia care unit were longer in Group A (protocol) than Group B(ketofol) (P = 0.013, P < 0.001, respectively)[4] which was in contrast to findings of our study .This fluctuation from results of our study could be because total fentanyl was increased in Group A more than Group B (P = 0.045) in above mentioned study.

Conclusion

Patients of Group P after stopping of infusion took less time for eye opening, obeying verbal command and also less time for extubation in comparison to group K.

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