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Original Research Paper

Anaesthesiology

PROPOFOL DEXMEDETOMIDINE VERSUS PROPOFOL KETAMINE FOR ANESTHESIA OF ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY (ERCP)

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ABSTRACT

Background: The aim of this study was to compare the effects of propofol/dexmedetomidine and propofol/ketamine combinations for anesthesia in patients undergoing ERCP regarding hemodynamic changes, propofol requirements and the recovery criteria. **Methods:** The study was conducted at Sri Aurobindo Institute of Medical Sciences Hospital, Indore,MP. Patient planned for ERCP were categorized into two groups. Group A (Propofol+dexmedetomidine) Group B (Propofol+Ketamine). Assessment of heart rate and mean arterial blood pressure changes pre procedure and for one hour post-procedure.

- Total propofol consumption by both groups recorded at the end of the procedure,
- Recovery time
- Level of postoperative pain assessed by visual analogue scale
- Incidence of side effects(nausea and vomiting, postoperative cognitive dysfunction)

Any respiratory complications were observed.

Results:

- The mean pre operative heart rate was significantly higher in Group A compared to Group B, While at all other post operative time points mean heart rate was significantly lower in Group A compared to Group B.
- The mean recovery time was significantly lower in Group A compared to Group B.
- The mean pain score was significantly higher in Group A compared to Group B.
- The prevalence of post operative cognitive dysfunction was significantly higher in Group B compared to Group A.
- There were no significant difference between the two groups for - Patient demographic data, Mean MAP post operative SPO2 level, Mean propofol requirement at the end of procedure,Post operative nausea vomiting, respiratory complication.

Conclusion: Both drug combination are effective,(Propofol+dexmedetomidine) combination have advantage of no post procedure delirium/cognitive dysfunction and hence early recovery time. Total propofol consumption has no clinical significant difference between the two groups.

KEYWORDS : ERCP, Propofol, dexmedetomidine, Ketamine.

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is commonly used in the management of many pancreatobiliary disorders. ERCP is the ideal method for extraction of common bile duct stones; it reduced the need for the more invasive surgical procedures associated with high morbidity particularly in old age patients. ERCP with stent placement can be very effective for the palliation of obstructive jaundice In pancreatic cancer patients 1,2.

The introduction and availability of different pharmaceutical agents such as propofol, ketamine and dexmedetomidine allow rapid induction of anesthesia while enabling rapid recovery.

Dexmedetomidine is a stereoisomer of medetomidine. It is a highly selective α2-agonist. It has a perioperative sedative, analgesic and anxiolytic properties similar to benzodiazepines but being α2 adrenoceptor agonist it has less side effects.

Co-administration of dexmedetomidine with other anesthetic agents, sedatives, hypnotics, or opioids is likely to cause additive effects, it attenuates but not completely abolishes stress-induced sympatho-adrenal responses protecting the patients from noxious sympathetic stimulation and hemodynamic changes and that is one of the main anesthetic goals 8, 9, 10, 11.

Propofol is a non barbiturate sedative hypnotic; it has a favorable pharmacokinetic profile as the lipid solubility confers a quick onset and short recovery time. It has also an anti-emetic, anticonvulsant, antipruritic and amnestic effects. Although it is extremely effective and potent, propofol use is limited by a relatively high incidence of dose-dependent hypotension and respiratory depression [12].

Ketamine is a phencyclidine derivative. It provides excellent amnesia and analgesia, preserves muscle tone with maintaining airway reflexes and spontaneous respiration. Despite its obvious advantages over other agents, it has significant adverse effects including; sympathomimetic effects, vomiting and excessive salivation even when administered in sedating doses [13].

We hypothesized that the combination of propofol with either dexmedetomidine or ketamine will improve the analgesic and anesthetic effects of these drugs with lower doses and less side effects. This will later help in providing adequate anesthesia and analgesia in ERCP procedures requiring general anesthesia.

MATERIAL AND METHOD

After Ethical committee clearance, a total of 50 patients age 18-70years scheduled for Endoscopic retrograde cholangio-pancreatography (ERCP) were selected randomly. An informed written consent was taken from all the patients relatives in groups

All patients underwent pre-anaesthetic evaluation before surgery.

- Routine investigations was done.

- Written informed consent were obtained.

Inclusion Criteria
- Patient undergoing Endoscopic retrograde cholangio-pancreatography (ERCP)
- Age 18-70 years

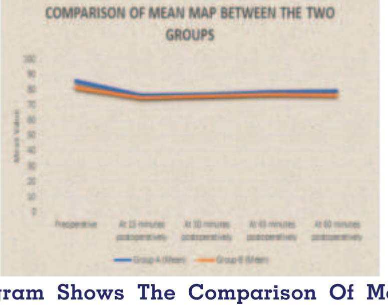
ASA GRADE 1 and 2

Exclusion Criteria
- Patient refusal.
- ASA GRADE 3 and 4.
- Patients with allergy to study drugs.
- Patients with cardiovascular disease (hypertension, congestive heart failure, and coronary artery disease).
- Cerebrovascular insufficiency, increased intracranial tension.
- Personality disorders or suspected pregnancy in addition to those receiving antipsychotic or sedative medication

RESULTS
- The mean pre operative heart rate was significantly higher in Group A compared to Group B, While at all other post operative time points mean heart rate was significantly lower in Group A compared to Group B.
- The mean recovery time was significantly lower in Group A compared to Group B.
- The mean pain score was significantly higher in Group A compared to Group B.
- The prevalence of post operative cognitive dysfunction was significantly higher in Group B compared to Group A.
- There were no significant difference between the two groups for - Patient demographic data, Mean MAP post operative SPO2 level, Mean propofol requirement at the end of procedure,Post operative nausea vomiting, respiratory complication.

Comparison Of MAP Between The Two Groups
Unpaired 't' Test Applied. P Value <0.05 Was Considered As Statistically Significant

Time Point	Group-A [Mean±SD]	Group-B [Mean±SD]	't' value, df	P value
Preoperative	86.07 ± 6.48	81.47 ± 6.83	2.683, df=58	0.009*
At 15 minutes postoperatively	76.40 ± 7.25	74.90 ± 5.33	0.913, df=58	0.365, NS
At 30 minutes postoperatively	77.47 ± 7.18	76.03 ± 5.89	0.845, df=58	0.402, NS
At 45 minutes postoperatively	79.07 ± 6.94	77.43 ± 6.36	0.950, df=58	0.346, NS
At 60 minutes postoperatively	79.23 ± 6.91	76.50 ± 6.84	1.541, df=58	0.129, NS

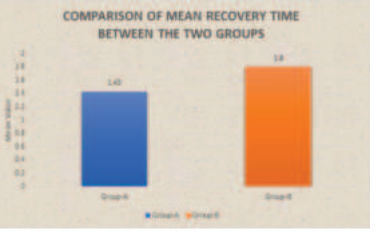


Line Diagram Shows The Comparison Of Mean MAP Between The Two Groups

Comparison Of Recovery Time Between The Two Groups

Group	Recovery time [Mean±SD]	't' value, df	P value
Group-A	1.43 ± 0.56	-2.348, df=58	0.022*
Group-B	1.80 ± 0.66		

Unpaired 't' Test Applied. P Value <0.05 Was Considered As Statistically Significant

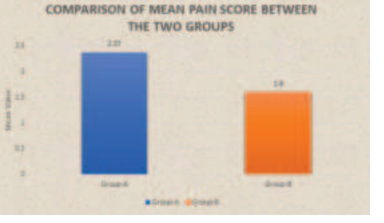


Bar Diagram Shows The Comparison Of Mean Recovery Time Between The Two Groups At The End Of The Procedure

Comparison Of Pain Score Between The Two Groups

Group	Pain score [Mean±SD]	't' value, df	P value
Group-A	2.37 ± 0.93	3.869, df=58	0.001*
Group-B	1.60 ± 0.56		

Unpaired 't' Test Applied. P Value <0.05 Was Considered As Statistically Significant

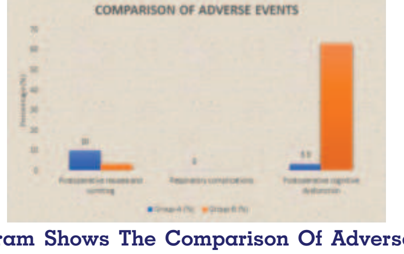


Bar Diagram Shows The Comparison Of Mean Pain Score Between The Two Groups At The End Of The Procedure

Comparison Of Adverse Events

Adverse Events	Group-A	Group-B	Z test value	P value
Postoperative nausea and vomiting	3 10.0%	1 3.3%	1.035	0.298, NS
Respiratory complications	0 0.0%	0 0.0%	-	-
Postoperative cognitive dysfunction	1 3.3%	19 63.3%	-4.929	0.001*

Z Test For Two Sample Proportion Applied. P Value <0.05 Was Considered As Statistically Significant



Bar Diagram Shows The Comparison Of Adverse Events Between The Two Groups

DISCUSSIONS

Previous Research	Previous Research Result	My Study Result
Mai W. Abdalla et al.	Dexmedetomidine propofol combination as TIVA during ERCP showed better intra and postprocedural hemodynamic stability, less PONV, less postoperative cognitive dysfunctions and shorter recovery time when compared with ketamine-propofol combination.	Both combinations of drugs demonstrate efficacy, with the Propofol and dexmedetomidine combination providing the advantage of minimizing postprocedure delirium and cognitive dysfunction, which contributes to a quicker recovery. Furthermore, there is no notable difference in the total amount of propofol used between the two groups.

Mohamed Sidky Mahmoud Zaki et al.	Dexmedetomidine-propofol combination was better than ketamine-propofol combination as regard; hemodynamic parameters (intra- and post-procedural), PONV, cognitive functions and recovery time. Incidence of pain had no clinical significant value between both groups. Total propofol consumption had no clinical significant difference between both groups.	Both drug combinations are effective, with the Propofol and dexmedetomidine combination offering the added benefit of reducing post-procedure delirium and cognitive dysfunction, leading to faster recovery. Additionally, there is no clinically significant difference in total propofol consumption between the two groups. Propofol + dexmedetomidine exhibited a significantly higher mean pain score compared to Propofol + Ketamine

CONCLUSION

Both drug combination are effective, (Propofol+ dexmedetomidine) combination have advantage of no post procedure delirium/cognitive dysfunction and hence early recovery time. Total propofol consumption has no clinical significant difference between the two groups.

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