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TO EVALUATE AND COMPARE THE EFFECTS OF PERIOPERATIVE INFUSION OF 2% LIGNOCAINE VERSUS DEXMEDETOMIDINE ON POSTOPERATIVE PAIN AND QUALITY OF RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERIES UNDER GENERAL ANESTHESIA

Anaesthesiology

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ABSTRACT

Background: It is important to have good postoperative pain control and early recovery after laparoscopic surgeries. Intravenous 2% lidocaine has anti-hyperalgesic, anti inflammatory and analgesic effects while dexmedetomidine provides anti-nociception, analgesic, sedative and sympatholytic effects. This study aims to compare the effects of both these drugs in terms of postoperative pain and quality of recovery after laparoscopic surgeries. **Method:** After obtaining approval of the hospital ethical committee and informed consent, 80 patients were randomly allocated into two group of 40 each, In group L (Lidocaine group), patients received intravenous 2% lidocaine (preservative free) 1.5mg/kg bolus followed by an infusion of 2mg/kg/hr and in group D (dexmedetomidine group), patients were given 1mcg/kg dexmedetomidine bolus followed by an infusion of 0.5mcg/kg/hr. The postoperative, pain scores, time for first request of rescue analgesia, total analgesic consumption and quality of recovery were recorded in both the groups. **Results:** The mean VAS score over 24 hours, Time for first request of rescue analgesia, Total Postoperative Analgesic Consumption was similar in both the groups. The Quality of Recovery Score –the combined QoR score was higher in group D 196.60±1.22 compared to group L 195.58±1.44 which was statistically highly significant (p=0.001) **Conclusion:** Perioperative infusions of dexmedetomidine and lidocaine were found to have a similar analgesic sparing effect. However, dexmedetomidine proved superior to lidocaine in the Quality of Recovery.

KEYWORDS

dexmedetomidine, lidocaine, postoperative pain, quality of recovery.

INTRODUCTION

Post operative recovery is a complex process consisting of various outcomes such as pain, adverse events, changes in psychological status. Multimodal analgesia has been proposed for pain relief and to obviate opioid related side effects. Systemic lidocaine is an effective adjuvant to reduce postoperative pain, nausea and vomiting, duration of ileus and hospital stay.[1,2,3] It is suggested that, lidocaine improves the quality of postoperative recovery and offers a true preventive analgesia by preventing the induction of central hyperalgesia. A highly selective α2 adrenoceptor agonist, dexmedetomidine induces analgesia, sedation and sympatholysis. An earlier postoperative recovery is made possible by perioperative administration, which enhances hemodynamic stability and reduces the need for postoperative analgesics, nausea, vomiting, and respiratory depression.[4]

The QoR (Quality of Recovery).has been assessd using the Global QoR-40 questionnaire.[5] The aim of this study is to evaluate and campare the effects of perioperative infusion of lidocaine versus dexmedetomidine in patients undergoing laparoscopic surgeries with regards to outcome parameters like, postoperative pain scores, analgesic consumption and recovery profile.

METHODS

This prospective randomized double- blind study was conducted in GGH Vijayawada from January 2022 to August 2022 on 80 adult patients. After obtaining approval of hospital ethical committee and informed consent, 80 patients were randomized into two groups of 40 each.

Inclusion Criteria

- Age between 18 to 60 years.
- Either sex
- ASA physical status I and II
- Undergoing laparoscopic cholecystectomy under general Anaesthesia in our institution

Exclusion Criteria

- History of allergy to study drugs
- chronic use of analgesics or any chronic drug therapy
- Patients with alcohol abuse, obesity, decreased autonomic control, renal or hepatic insufficiency.
- Pregnant patients

Sample size was estimated based on the findings of pilot study where the primary outcome being mean Quality of recovery score using α=0.05, β=0.20 and power of 80% the calculated sample size was 40 patients per group.

Group L(n=40) received intravenous 2% lidocaine (preservative free) 1.5mg/kg bolus followed by an infusion of 2 mg/kg/hr.

Group D (n=40) received dexmedetomidine 1 mcg/kg bolus followed by an infusion of 0.5mcg/kg/hr.

In both groups, bolus dose of study drug was prepared in a volume of 20 ml and infused over 10 minutes and hourly infusion rate was prepared in a volume of 50 ml to be infused over 1 hour and drug solutions were prepared by anaesthesia resident who is unaware of the study protocol to ensure Double blinding.

During the pre-operative visit, patients were familiarized with the use of a 10-point visual analogue score (VAS) where 0 corresponds to no pain and 10 corresponds to worst pain and the QoR questionnaire. General Anaesthesia was administered according to standard protocol in both the groups. Bolus doses were administered 10 minutes before the start of anesthesia followed by infusion until trocars were removed. After recovery the patients were shifted to the post anesthetic care unit (PACU).

All the patients were observed in the PACU for 24 hours. Immediately on arrival in PACU, sedation was assessed by sedation score. Pain was assessed at 15 min, 30min, 1hr, 2hr, 4hr, 8hr, 12hr, and 24hr postoperatively using the VAS score. When the VAS score >3 or when the patient requested analgesia, intravenous diclofenac 1.5mg/kg was administered. 24 hours later, patients were asked questions as per quality of recovery – 40 (QoR-40) questionnaire which contains 40 questions that examine 5 domains of patient recovery and QoR score was recorded. 1. Emotional state, 2. Physical comfort 3.Psychological support 4. Physical independence, 5.Pain.

Data collected was subjected to statistical analysis. Students t test was used to assess mean VAS score and QoR-40. For qualitative variables.

Fischer's exact test or the chi square test was used. A p value<0.05 was used to define statistical significance.

RESULTS

There was no significant difference between the two groups with respect to demographic data like age, weight, height, sex, and duration of surgery. (p value > 0.05) The mean VAS score over 24 hours in group D was 0.55±0.90 Vs 0.67±1.14 in groupL (p=0.602), Time for first request of rescue analgesia was 281.12±33.78 minutes in group D versus 276.37±39.95 min in group L (p=0.567).

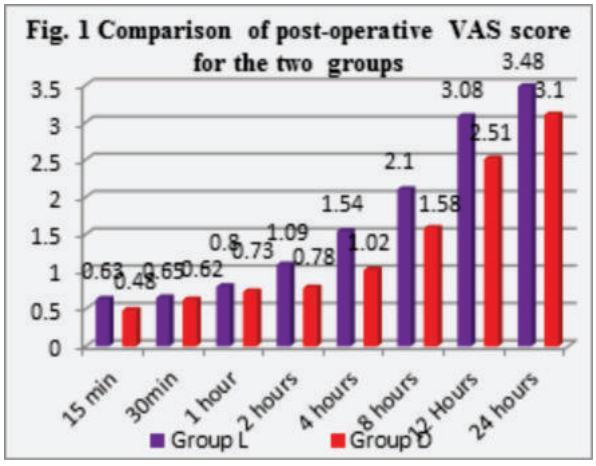

Table 1: The Quality of Recovery Score in Group L and Group D.			
QoR domain	Group L (Mean ± SD)	Group D (Mean ±SD)	p value
Emotional State	44.30 ± 0.66	44.75 ± 0.44	0.01
Physical Comfort	58.55 ± 1.43	59.40 ± 0.50	0.01
Psychological Support	34.70 ± 0.47	35.00 ± 0.00	0.007
Physical *Independence	24.65 ± 0.59	24.95 ± 0.22	0.03
Pain	34.55 ± 0.60	34.90 ± 0.31	0.02

All domains were significantly higher in Group D as compared to Group L p =<0.05

Total Postoperative Analgesic Consumption in group D was 16.29± 30.66 Vs 16.87± 31.71 (mg) in group L(p=0.933) and were comparable with no significant difference in between the groups.

Similar Postoperative sedation scores were observed in both the groups.

Table 2: Total Postoperative Analgesics Consumption			
	Group L (Mean ± SD)	Group D (Mean ±SD)	p value
Injections diclofenac	16.87± 31.71	16.29± 30.66	0.933 (NS)

similar in both the groups p=>0.05 (NS)

The Quality of Recovery Score – combined score and all domains - the combined QoR score was higher in group D 196.60±1.22 compared to group L 196.58±1.44 which was statistically highly significant (p=0.001)

DISCUSSION

Lidocaine infusions are beneficial in attenuating intraoperative hemodynamic response, shortens hospital stay, reduces postoperative pain and opioid consumption. Dexmedetomidine shows dose-dependent hemodynamic effects and is effective in attenuating stress response during surgery. It has opioid sparing effect and provides hemodynamic stability and a superior quality of overall recovery.

Gildasio S De Oliveira Jr et al.,[6] Systemic lidocaine at a dose of 1.5mg/kg bolus followed by an infusion of 2 mg/kg/hr improved postoperative quality of recovery after ambulatory laparoscopic surgery. We used same dose with similar effect in our study. Shirish Kumar G Chavan et al.,[7] concluded that Dexmedetomidine maintains the hemodynamic stability when used as an adjuvant in general anesthesia and does not del--ay recovery. Our study findings correlate with this study. Kwangrae Cho et al.,[8] in their study on Effect of perioperative infusion of lidocaine vs. Dexmedetomidine after laparoscopic cholecystectomy showed reduced consumption of postoperative analgesics and higher recovery score with Dexmedetomidine group. Our study findings are similar to their study. The QoR Score was first used by Myles P and colleagues[5] and has been validated as a tool for assessing overall recovery. We used the same score in our study for assessing quality of recovery.

CONCLUSION

Our Study concludes that, perioperative infusions of lidocaine and dexmedetomidine were found to have a similar effect on postoperative pain relief and reduction in analgesic consumption in patients undergoing laparoscopic surgeries. However, the use of perioperative dexmedetomidine proved to be superior to lidocaine in the quality of recovery resulting in earlier and better postoperative recovery.

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