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Original Article

Comparison of Patient Satisfaction using ASSIST Score following Intraperitoneal Instillation of Ropivacaine Alone versus with Adjuncts for Postoperative Analgesia in Laparoscopic Cholecystectomy

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ABSTRACT

Background: Evaluation of patient satisfaction score and to assess quality of pain relief following intraperitoneal instillation of Ropivacaine with adjuncts Dexmedetomidine vs Ketamine using modified version of revised APS-POQ in patients undergoing laparoscopic cholecystectomy.

Methods: Sixty patients undergoing laparoscopic cholecystectomy were randomised into three groups of 20 each and received Ropivacaine 0.2 % (group R), Ropivacaine 0.2 % with Dexmedetomidine 0.7µg/ kg (group RD) and Ropivacaine with Ketamine 0.5 mg/kg (group RK) in a total volume of 40 ml. Pain severity, subjective pain complaints, pain interference in physical activity, and patient's and caregiver's satisfaction were evaluated using a modified version of the revised APS-POQ at 24 hours postoperatively.

Result: Mean pain scores for worst pain were observed to be least in Group RD, with mean values being 1.75±1.743, followed by 5.45±1.701 in Group R and mean value of 5.60±0.754 in Group RK. Mean patient satisfaction scores were found to be highest in Group RD (94.00±8.826), followed by Group R (80.00±15.218), and least in Group RK (78.50±12.258). This difference was observed to be statistically significant ($p<0.05$) in all groups. Primary care physicians caring for the RD group had higher satisfaction scores (9.40±0.883) compared to Group RK (7.85±1.226) and Group R (8.05±1.468)

Conclusion: Quality of pain relief improved the best with Dexmedetomidine followed by Ketamine and least when Ropivacaine used alone for intraperitoneal instillation. The overall patients' satisfaction was found to be more with Ropivacaine with Dexmedetomidine when compared to Ropivacaine alone or with Ketamine

Keywords: laparoscopic cholecystectomy, dexmedetomidine, ropivacaine, ketamine, intraperitoneal, pain assessment

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INTRODUCTION

Pain is a multifaceted experience personalized to each patient and is influenced by the biological, social, and psychological state. The greater the intensity and duration of pain a patient experiences, the higher the chances of them developing chronic persistent post-surgical pain.; therefore, assessment of postoperative pain and its proper management would help in recovery and efficient delivery of health care services.[1] Effective pain management is determined by assessment and timely response wherein the self-reporting of pain is often subjective; thus arises the need for pain scores for an objective assessment of acute postoperative pain.

Pain following laparoscopic cholecystectomy during the initial post-operative hours is usually felt during mobilization, coughing, and deep respiration.[2] This pain is essentially multifactorial; shoulder tip pain is attributed to phrenic nerve stimulation as a result of residual carbon dioxide in the peritoneal cavity, visceral nociception due to stretching of the abdomen, localized inflammation due to dissection[3], and minimal somatic pain as a result of small surgical incisions.

Pain scores such as the Numeric Rating scale, Visual Analogue scale, and Verbal rating scale are valid and demonstrably reliable scales for patients who can self-report acute postoperative pain.[4] Restoration of daily function by

allowing the patient to turn around in bed, cough, and ambulate enhances recovery, and thus, assessment of the functional aspect of pain is essential to expedite recovery.[4]

Multidimensional pain assessment using cumbersome, long questionnaires often leads to assessor fatigue; thus, the assessment results show less clinical correlation. Therefore, patients' postoperative pain must be assessed continuously to determine their comfort and satisfaction. Hence, a satisfaction score in addition to the pain assessment score is crucial so that patient discomfort does not go unnoticed.[5] Efficacious postoperative pain management remains a challenge for anesthesiologists.[6]

The present study has been evaluated using the Revised American Pain Society Patient Outcome Questionnaire (R-APS-POQ) to assess the quality of pain, which had been developed to assist institutes in improving the quality of pain management. It was initially published in 1991, after which it underwent a few alterations and regional modifications according to the subset of populations it dealt with.[7,8] This simple and objective questionnaire is used to assess postoperative pain.[8]

Intraperitoneal administration of local anesthetics offers an effective alternative to the use of systemic opioids, avoiding side effects such as nausea, vomiting, and sedation and thus promoting Enhanced Recovery After Surgery.[9,10] However, since this mode of pain relief is said to be associated with unpredictable duration of analgesia[9], therefore in our study, we have compared adjuncts Dexmedetomidine versus Ketamine along with Ropivacaine. This study was designed to compare the overall satisfaction of patients after the instillation of Ropivacaine alone, with Ketamine vs. with Dexmedetomidine following laparoscopic cholecystectomy using the ASSIST questionnaire, which is a modified version of the R-APS-POQ.[11] This questionnaire has been used satisfactorily and found to be an effective tool for assessing acute pain.[11] Therefore, this study assessed the quality of pain relief and compared patient satisfaction in the patients who received intraperitoneal Ropivacaine alone versus Ketamine or Dexmedetomidine, the combination of adjuncts that have not been compared formerly.

METHODS

Following approval from the institutional ethics committee (IEC-HR/2019/41/20R), this randomized, double-blind study was carried out at a tertiary care hospital. Additionally, it was registered with the Clinical Trials Registry of India (CTRI/2019/11/022129). Between November 2019 and October 2021, this study enrolled sixty patients, both male and female, aged 20 to 55 years, with American Society of Anesthesiologists (ASA) grade I and II, undergoing laparoscopic cholecystectomy under general anesthesia. The objective was to evaluate patient satisfaction and the effectiveness of postoperative pain relief through intraperitoneal instillation of the local anesthetic Ropivacaine alone or in combination with adjuncts. Quality of pain assessment was done using a modified version of the Revised American Pain Society Patient Outcome Questionnaire, one of our study's secondary objectives.

Patients who had associated comorbidities such as cardiovascular, pulmonary, psychological, or neurological diseases, or had a history of epilepsy, increased intracranial tension, known allergy to the study drugs, and heart rhythm abnormalities like heart block, left bundle branch block were excluded from the study. Patients with obesity (BMI>30), those whose procedure was converted to open cholecystectomy, and individuals who had a drain inserted in the subhepatic region post-cholecystectomy were excluded from the study.

Sixty patients meeting the aforementioned selection criteria were chosen and randomly assigned to three groups on the day of surgery using a computer-generated random number chart. In the Control Group (n=20), 20 patients were administered 0.2% plain Ropivacaine in a 40 ml instilled solution. Patients in Group RD (n=20) received a mixture of 0.7µg/kg Dexmedetomidine with 0.2% Ropivacaine in a 40 ml instilled solution. Patients in Group RK (n=20) were given a combination of 0.5 mg/kg Ketamine with 0.2% Ropivacaine in a 40 ml instilled solution.

The study drug solution was prepared by an anesthesiologist who was not part of the study team. Both the anesthesiologist observing the patient and the surgeon involved remained unaware of the study group until the study's conclusion. A comprehensive pre-anesthetic assessment and necessary investigations were conducted for all enrolled patients. Detailed explanation of the procedure was provided to each patient one day before surgery, and written informed consent for anesthesia was obtained from all participants. The anesthetic management and intraperitoneal drug instillation following laparoscopic cholecystectomy was carried out as per the methodology described in the previous study by Kapoor et al.[12]

In both groups, intravenous ondansetron 0.1mg/kg was administered. After the surgery, any residual neuromuscular blockade was reversed using Neostigmine 0.05 mg/kg and Glycopyrrolate 0.01 mg/kg. Post extubation, the patient was shifted to the post-anesthesia care unit.

After 24 hours post-surgery, patients were requested to fill out a questionnaire modified from the Revised APS-POQ designed to assess the quality of pain management among hospitalized patients. The primary clinician in charge of the patient care performing the assessment was not directly involved in our study and was blinded to the treatment modalities for pain management. The pain intensity during the 24 postoperative hours was assessed towards the following lines: preventing activities such as turning, sitting up, repositioning, walking, sitting in a chair, falling, and staying asleep. Patients were also asked to report whether the pain caused them to feel anxious, depressed, frightened, or helpless and whether it was associated with side effects such as nausea, drowsiness, itching, and dizziness. The patients were also inquired about the overall satisfaction they gained from all the pain modalities combined and whether or not they suffered from any adverse drug reaction during the observation period. All patients received Paracetamol 20 mg/kg body weight IV every 6 hours and Diclofenac Sodium 1 mg/kg IV every 12 hours for the subsequent 24 hours to maintain satisfactory analgesia and manage breakthrough pain in the postoperative period. The surgical team was instructed not to give other analgesics postoperatively.

The three study groups were compared using one-way ANOVA followed by Tukey's test. However, due to the non-Gaussian distribution and skewness observed in many variables of our data, nonparametric tests, namely the Kruskal-Wallis Test followed by the Mann-Whitney U test, were applied for these parameters. The analysis was conducted using SPSS version 20.0, and a p-value <0.05 was considered significant.

RESULT

Seventy participants were assessed for eligibility for the trial, seven of whom were excluded and 63 enrolled, as shown in the CONSORT diagram (**Figure 1**).

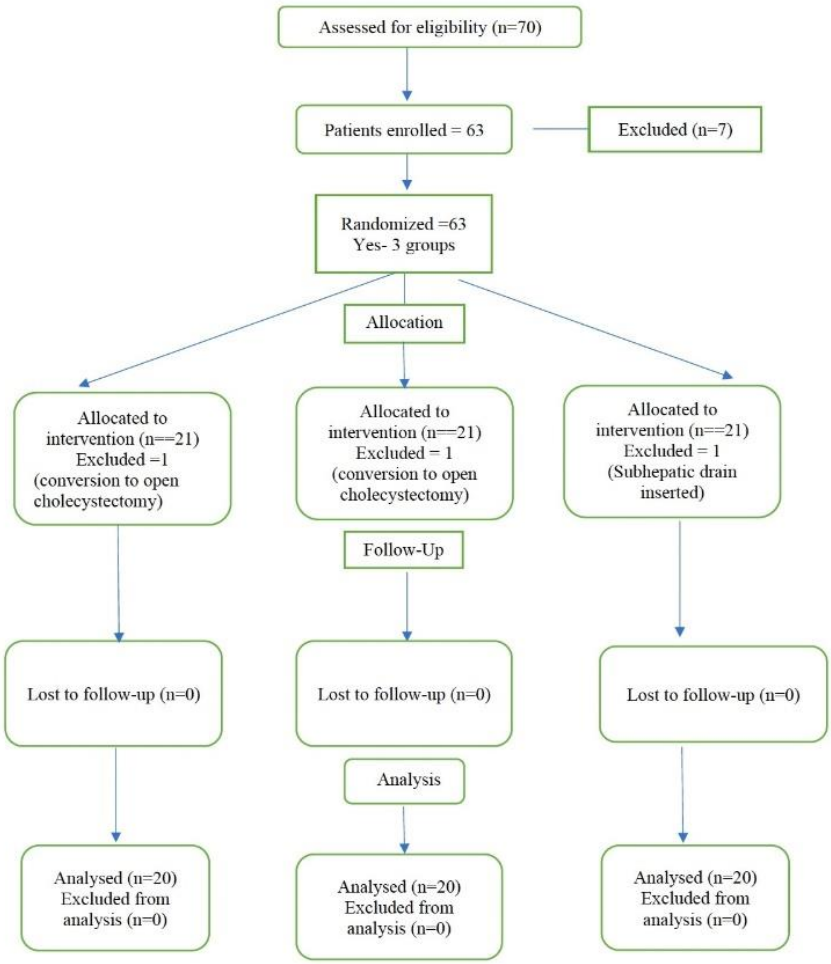

Figure 1. Consort Flow Diagram

Out of the total 60 patients enrolled in this study, there were only 4 male patients: 1 in Group R, 2 in Group RD, and 1 in Group RK. The difference in sex distribution among the three groups was found to be comparable. The age of the patients in Group R ranged from 20 to 56, with a mean of 42.15±9.516 years. In group RD, the age of the patients ranged from 23 to 55, with the mean being 35.55±9.271 years. In group RK, age ranged from 22 to 55 with a mean of 36.55±9.133 years. The mean weight of the patients was 62.15±7.073, 57.65±10.017, and 58.25±7.025 kilograms in Group R, RD, and RK, respectively.

The quality of post-operative pain was assessed at 24 hours using the modified version of the Revised American Pain Society Patient Outcome Questionnaire; the responses were noted and analyzed. Each questionnaire question was given a number from 1 to 17 for statistical analysis. Q1-Q4 deals with Pain Scales, Q6-Q12 deals with patient satisfaction scores, Q13 is the caregiver's satisfaction score, and Q14-17 is the remaining questions. Further, the components of Q9 and Q10 were labeled as Q9 A-D and Q10 A-D.

Q1: Patients were asked whether they experienced pain in the past 24 hours. The response "yes" was designated 1 and "no" as 0 for analysis. The difference was statistically insignificant since all groups had some degree of post-operative pain in the first 24 hours.

Q2 to 8 were analyzed using the Kruskal Wallis test and the Mann-Whitney U test (**Table 1**). Q2: On a scale of 0 to 10, the patients were asked to circle the least pain they experienced during the past 24 hours, 0 being no pain and 10 being the "worst pain possible. The mean pain scores were the lowest in Group RD, with values of 0.20±0.410, followed by 1.15±0.587 in Group RK, and 1.65±0.933 in Group R.

Q3: On a scale of 0 to 10, the patients were asked to circle the worst pain they experienced during the past 24 hours, 0 being no pain and 10 being the "worst pain possible." The mean pain scores were observed to be the lowest in Group RD, with mean values being 1.75±1.743, followed by 5.45±1.701 in Group R and the mean value of 5.60±0.754 in Group RK, being the highest in the three groups.

Q4: Patients were asked to indicate the percentage of time they were in severe pain the past 24 hours, 0% being "never in severe pain" and 100% being "always in severe pain." The mean responses were lowest in Group RD (4.00±5.026%), followed by Group RK (11.00±6.407%), and then maximum in Group R (14.50±10.501%).

Q5: Patients were asked to indicate how much their pain interfered with or prevented them from doing activities such as turning, sitting up, and repositioning on a scale of 0 to 10, 0 being "does not interfere at all" and 10 being "completely interferes with above." Group RD reported little to no interference while doing the above movements, the mean of responses being 0.90±0.912. Groups R and RK reported some interference of pain during this movement, slightly higher in Group RK (3.00±1.026) compared to Group R (2.95±1.317).

Q6: Patients were asked to indicate how much their pain interfered with or prevented them from doing activities such as walking, sitting in a chair, or other activities on a scale of 0 to 10, 0 being "does not interfere at all" and 10 being "completely

interferes with above." The mean value of responses was least in Group RD (1.75±1.773), followed by Group R (4.60±1.231), and highest in Group RK (5.05±0.826).

Q7: The patients were asked to indicate how much their pain interfered or prevented them from falling asleep on a scale of 0 to 10: 0 being "does not interfere at all" and 10 being

Table 1. Showing Q 2 to 10 from the modified APS-POQ-R

Questions	Group R (n=20) (Mean±SD)	Group RD (n=20) (Mean±SD)	Group RK (n=20) (Mean±SD)	Significance (KW test)	p-value (Multiple comparison by Mann Whitney U)
Q2: Least pain you had in the first 24 hours	1.65±0.933	0.20±0.410	1.15±0.587	0.000	0.000* 0.000† 0.060‡
Q3: Worst pain you had in the first 24 hours	5.45±1.701	1.75±1.743	5.60±0.754	0.000	0.000* 0.000† 0.931‡
Q4: How often were you in severe pain? (%)	14.50±10.501	4.00±5.026	11.00±6.407	0.000	0.000* 0.001† 0.371‡
Q5 How much pain interfered with or prevented you from doing activities in bed, such as turning, sitting up, and repositioning?	2.95±1.317	0.90±0.912	3.00±1.026	0.000	0.000* 0.000† 0.922‡
Q6 How much pain interfered with or prevented you from doing activities out of bed, such as walking, sitting in a chair, or standing at the sink?	4.60±1.231	1.75±1.773	5.05±0.826	0.000	0.000* 0.000† 0.354‡
Q7: How much pain interfered or prevented you from falling asleep?	1.65±1.268	.00±0.000	1.00±1.170	0.000	0.000* 0.000† 0.091‡
Q8: How much pain interfered with or prevented you from staying asleep?	1.20±1.281	.00±0.000	1.05±1.432	0.002	0.000* 0.002† 0.610‡
Q10.A: How often have you experienced nausea in the past 24 hours	1.25±1.773	0.15±0.489	2.35±1.725	0.000	0.020* 0.000† 0.067‡

*between R and RD, †Between RD and RK, ‡ between R and RK; p-value < 0.05 is significant

Table 2. Showing Q 11 to 13 from the APS-POQ-R

Questions	Group R(n=20) (Mean±SD)	Group RD(n=20) (Mean±SD)	Group RK(n=20) (Mean±SD)	Significance (One-way ANOVA)	p-value (Tukeys's)
Q11: How much pain relief did you receive from all of your pain treatments combined?	80.00±15.218	94.00±8.826	78.50±12.258	0.000	0.002* 0.001† 0.922‡
Q12: How satisfied are you with the results of your pain treatment while in the hospital?	8.05±1.468	9.40±0.883	7.85±1.226	0.000	0.003* 0.000† 0.862‡
Q13: How satisfied you are with the results of your patient's pain relief and recovery while in the hospital?	8.05±1.468	9.40±0.883	7.85±1.226	0.000	0.003* 0.000† 0.862‡

*between R and RD, †Between RD and RK, ‡ between R and RK; p-value < 0.05 is considered significant

Table 3. Showing Q 14 to 16 from the modified APS-POQ-R

Questions	Group R(n=20) (Mean±SD)	Group RD(n=20) (Mean±SD)	Group RK(n=20) (Mean±SD)	Significance (KW test)	p-value (Multiple comparison by Mann Whitney U)
Q14: Indicate the pain you feel while lying in bed without moving:	1.65±1.226	0.35±0.489	1.65±0.745	0.000	0.000* 0.000† 0.763‡
Q15: Indicate the pain you feel while lying in bed without moving:	2.60±1.501	0.50±0.688	2.40±0.503	0.000	0.000* 0.000† 0.686‡
Q16: How many hours in the last 24 hours were you in severe pain?	2.24±2.140 hr	0.27±0.420 hr	1.66±1.872 hr	0.000	0.000* 0.001† 0.400‡

*between R and RD, †Between RD and RK, ‡ between R and RK; p-value < 0.05 is considered significant

"completely interferes with above." None of the patients in the RD group reported any difficulty falling asleep. However, 16 out of 20 patients in the R group complained of pain interfering while falling asleep, with mean values of responses being 1.65±1.268 compared to only 10 patients complaining of the same in Group RK (mean scores 1.00±1.170).

Q8: The patients were asked to indicate how much their pain interfered or prevented them from staying asleep on a scale of 0 to 10: 0 being "does not interfere at all" and 10 being "completely interferes with above." None of the patients in the RD group reported any difficulty while staying asleep, but 10 patients in Group R complained of the pain interfering with their ability to stay asleep (mean scores 1.20±1.281) compared to 8 patients complaining of the same in Group RK (mean scores 1.05±1.432).

Q9 was subdivided into four components, and the patients were asked to indicate on a scale of 0 to 10 whether the pain caused them to feel 9A-anxious, 9B-depressed, 9C-frightened, and 9D-helpless. None of the subjects in this study reported the above complaints, and therefore, the values were found to be insignificant in all groups and have not been included in the results.

Q10 was also subdivided into four parts, and the patients were asked to indicate on a scale of 0 to 10 whether they experienced any of the following side effects in the past 24 hours: 10A-Nausea, 10B- Drowsiness, 10C- Itching, 10D- Dizziness. Although none of the study subjects reported any drowsiness, itching, or dizziness following the surgery, the incidence of nausea in group RK was found to be highest amongst the three groups (2.35±1.725) in comparison to Group R (1.25±1.773), followed by Group RD (0.15±0.489) as shown in Table 1. This difference was found to be statistically significant among the three groups. The responses for Q10B, 10C & 10D were zero; hence, they were not included in the result.

Q11 to Q13 were analyzed using One-way ANOVA followed by Tukey's test (**Table 2**). Q11: The patients were asked to indicate how much pain relief they had received from all their pain treatments combined, with 0% being "No relief" and 100% being "Complete relief." The mean satisfaction scores were found to be highest in Group RD (94.00±8.826), followed by Group R (80.00±15.218), and least in Group RK (78.50±12.258). This difference was statistically significant (p-value < 0.05) in all groups.

Q12: The patients were asked to indicate on a scale of 0 to 10 how satisfied they were following their pain treatment in the hospital, with 0 being "Extremely dissatisfied" and 10 being "Extremely satisfied." Patients in Group RD had higher satisfaction scores (9.40±0.883) compared to Group RK (7.85±1.226) and Group R (8.05±1.468).

Q13: The patients' primary care physician, who was not involved in this study, was asked to encircle on a scale of 0 to 10, indicating how satisfied they were with the patient's pain relief and post-operative recovery, 0 being "extremely dissatisfied" and 10 being "extremely satisfied." The physicians caring for the RD group had higher satisfaction scores (9.40±0.883) compared to Group RK (7.85±1.226) and Group R (8.05±1.468).

Q14 to Q16 were analyzed using the Kruskal-Wallis test and the Mann-Whitney U test (**Table 3**). Q14: Patients were asked to indicate on a scale of 0 to 10 the severity of pain they felt while lying in bed without moving, 0 being "No pain" and 10 being "Worst pain imaginable." The mean score in Group RD was lower (0.35±0.489) compared to Group R (1.65±1.226) and Group RK (1.65±0.745).

Q15: Patients were asked to indicate on a scale of 0 to 10 the severity of pain they felt while trying to move, 0 being "No pain" and 10 being " Worst pain imaginable." The mean scores in Group RD were lower (0.50±0.688) compared to Group R (2.60±1.501) and Group RK (2.40±0.503).

Q16: The patients were asked the approximate number of hours in the past 24 hours that they remained in severe pain. The mean time in Group RD was significantly lower (0.27±0.420) hours in comparison to Group R (2.24±2.140) hours and Group RK (1.66±1.872) hours.

In the questions numbered Q2-16, as a common feature, there was statistical significance between Group R and RD and Group RD and RK, but no statistical significance was observed between Groups R and RK.

Q17: Patients were finally asked whether they suffered any adverse drug reaction related to the use of analgesic(s) during the postoperative period. The response "yes" was designated as 1 and "no" as 0. None of the participants reported any adverse events following intraperitoneal instillation of drugs; therefore, the values were comparable in all three groups and statistically insignificant (p-value < 0.05).

DISCUSSION

Quantifying and measuring post-operative pain is a challenge for the clinician as it is typically subjective and complex. Despite the extensive armamentarium of pain scores and modern tools available in clinical practice, anesthesiologists often cannot accurately assess pain and address it accordingly. To manage pain to the best of our ability, the mechanism of pain needs to be understood, and the fear, anxiety, and helplessness that influence pain must be emphasized.[13] Revised American Pain Society questionnaire is a multidimensional pain assessment score with psychometric properties such as internal consistency. Moreover. being a quick score, its calculation requires 5 to 30 minutes, making it repeatable and convenient.

Though pain is widely acknowledged as the fifth vital sign, it is crucial to not only treat it appropriately but also shift our focus to functional recovery and not mere pain relief.[14,4] Thus, a patient satisfaction score and a pain assessment score are essential so that patient discomfort does not go unnoticed. Similar RCTs have been conducted to compare the efficacy of intraperitoneal local anesthetics used alone or with an adjuvant against placebos. However, most studies have evaluated post-operative pain using mean VAS or NRS scores.[15,3] In the present study, the nature of pain along with various subsets of complaints like feelings of anxiousness, helplessness, drowsiness, pruritis, interference with movement or sleep, as well as satisfaction or lack thereof achieved from the different pain treatment modalities have been compared 24 hours after the completion of surgery. The patients were given a questionnaire, which is a modified version of the Revised American Pain Society Patient Outcome Questionnaire, to assess the quality of pain management among surgical patients.

The American Pain Society published the initial standards for the relief of acute and cancer pain management in the form of APS-POQ in 1991 as a form of quality assurance which was subsequently revised in 1995, 2005, and 2010.[16] The most recent update encompasses five key aspects: (1) Severity of pain, (2) Interference with activities, (3) Affective experiences (emotional), (4) Side effects (safety), and (5) Perceptions of care (satisfaction).The primary rationale of the Revised Version of APS-POQ was easy administration of the individual subscales to detect differences in outcomes in different groups and to judge which patient characteristics affected the quality of pain

management to make appropriate adjustments. The APS-POQ-R has been previously validated in several different populations, including general gynecological/ surgical patients[17,18], general orthopedic patients[19], and patients with acute abdominal pain.

Intraperitoneal instillation of local anesthetics has been widely explored as an alternative to intravenous systemic opioids for postoperative pain relief after laparoscopic procedures. Still, when used alone, variable results have been observed.[20] Due to the conflicting results in these studies when using local anesthetics for peritoneal instillation, we have added and compared adjuvants Dexmedetomidine versus Ketamine with Ropivacaine versus Ropivacaine alone. Also, Ropivacaine offers the distinct advantage of being less cardiotoxic than Bupivacaine and, thus, safe to administer in large doses.[21]

In this study, all patients reported postoperative pain in 24 hours; however, the incidence of the worst pain in 24 hours was least in Ropivacaine with Dexmedetomidine group, followed by Ropivacaine (control) group and highest being in Ropivacaine with Ketamine group. The severity of the worst pain was found to be the least in the RD group, followed by RK, and was highest in the Ropivacaine group. Patients in the RD group had nearly no incidence of pain interfering with activities such as turning, sitting up and repositioning, and doing activities such as walking and sitting in a chair. In contrast, Groups R and RK did report some interference of pain during these movements, slightly higher in the Ketamine group, reflecting the comfortable experience in the recovery room in the RD group. During the inquiry about sleep habits, patients were requested to indicate the extent to which their pain interfered with or hindered their ability to fall asleep and remain asleep. None of the patients in the Dexmedetomidine group reported any difficulty falling or staying asleep; however, 16 out of 20 patients in the Ropivacaine group and 10 patients in the Ketamine group complained of pain interfering while falling asleep. This finding may affect the postoperative recall of unpleasant experiences of pain, which is significantly less in the Dexmedetomidine, leading to increased overall patient satisfaction due to minimal interference with activities and sleep.

None of the patients in our study experienced feelings of anxiety, helplessness, depression, or fear during the postoperative period. However, when asked about other side effects like "nausea, drowsiness, itching or dizziness", many patients in Group RK and R did complain of significant nausea. No patients had any complaints of drowsiness, dizziness, or itchiness.

Mean satisfaction scores with reference to the degree of pain relief from all therapies and satisfaction scores among the primary care physicians not involved in the study were found to be highest in Group RD, followed by Group R and RK. The mean duration of hours that patients spent in severe pain was found to be lower (0.27±0.420) in Group RD in comparison to Group R (2.24±2.140) and RK (1.66±1.872). The endpoint of pain using this pain relief modality directly corresponds to patient satisfaction, which we have demonstrated in this study. None of the patients in the present study had any adverse events in the three groups.

After scrutinizing all the sections of the questionnaire and evaluating the patients' responses, it can be ascertained that patients were more satisfied with Ropivacaine with Dexmedetomidine than with Ropivacaine alone or with Ketamine. However, it must be noted that the mean response in all three groups was above 7 when asked about satisfaction following the pain treatment. Thus, all patients were reasonably satisfied with the pain management despite the increased incidence of nausea in the ketamine group as well as the control group. Recent studies have evaluated the anti-emetic properties of Dexmedetomidine and have proved its usefulness for the prevention of PONV, which may be explained by reduced sympathetic outflow and catecholamine release caused by dexmedetomidine.[22]

We found very few studies that utilized the revised APS-POQ about the Indian subcontinent evaluating different groups of drugs being used intraperitoneally for post-operative pain relief in laparoscopic surgeries as Acute Pain Services are still in the preliminary stage.[11]The primary limitation of this study is that the perception of pain is subjective and cannot be quantified by any objective assessment. Different populations have varying pain thresholds, illustrating an interindividual variability in demand for analgesia for the same surgical procedure. The precise mechanism, dosage duration, and Ropivacaine's systemic absorption alone or when used with Dexmedetomidine and Ketamine is still being studied.

CONCLUSION

The following study can conclude that the quality of pain relief was preferable with Dexmedetomidine with Ropivacaine followed by Ketamine and least when Ropivacaine was used alone for intraperitoneal instillation. Overall patient satisfaction was found to be higher with Dexmedetomidine when compared to Ropivacaine alone or with Ketamine. Thus, APS POQ is a useful tool for pain assessment and can be incorporated to guide pain management and compare different drug combinations or treatment modalities.

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CONFLICT OF INTEREST

The author declares there is no conflict of interest.

REFERENCES

1. Small C, Laycock H. Acute postoperative pain management. *Br J Surg*. 2020;107(2):e70-e80. doi:10.1002/bjs.11477
2. El-Labban GM, Hokkam EN, El-Labban MA, Morsy K, Saadl S, Heissam KS. Intraincisional vs. intraperitoneal infiltration of local anesthetic for controlling early post-laparoscopic cholecystectomy pain. *J Minim Access Surg*. 2011;7(3):173-177. doi:10.4103/0972-9941.83508.
3. Das NT, Deshpande C. Effects of Intraperitoneal Local Anaesthetics Bupivacaine and Ropivacaine versus Placebo on Postoperative Pain after Laparoscopic Cholecystectomy: A Randomised Double Blind Study. *J Clin Diagn Res*. 2017;11(7):UC08-UC12. doi:10.7860/JCDR/2017/26162.10188

4. Baamer RM, Iqbal A, Lobo DN, Knaggs RD, Levy NA, Toh LS. Utility of unidimensional and functional pain assessment tools in adult postoperative patients: a systematic review. *Br J Anaesth*. 2022;128(5):874-888. doi:10.1016/j.bja.2021.11.032.
5. Köse Tamer, L, Sucu Dağ G. The Assessment of Pain and the Quality of Postoperative Pain Management in Surgical Patients. *SAGE Open*. 2020;10(2).
6. Kasahun HG, Agizew TB, Temesgen MM, Ashagrie HE. Assessment of acute postoperative pain management and associated factors after elective surgery among adult surgical patients: a prospective cross-sectional study. *IJS Short Reports*. 2022;7(1):e37
7. Hamid M, Gangwani A, Akhtar M. A quality improvement survey to assess pain management in cardiac surgery patients. *Open Journal of Anesthesiology*. 2015;05(05):105-112. doi:10.4236/ojanes.2015.55020
8. Gordon DB, Polomano RC, Pellino TA, et al. Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R) for quality improvement of pain management in hospitalized adults: preliminary psychometric evaluation. *J Pain*. 2010;11(11):1172-1186. doi:10.1016/j.jpain.2010.02.012
9. Gurusamy KS, Nagendran M, Guerrini GP, Toon CD, Zinnuroglu M, Davidson BR. Intraperitoneal local anaesthetic instillation versus no intraperitoneal local anaesthetic instillation for laparoscopic cholecystectomy. *Cochrane Database Syst Rev*. 2014;(3):CD007337. doi:10.1002/14651858.CD007337.pub3
10. Yong L, Guang B. Intraperitoneal ropivacaine instillation versus no intraperitoneal ropivacaine instillation for laparoscopic cholecystectomy: A systematic review and meta-analysis. *Int J Surg*. 2017;44:229-243. doi:10.1016/j.ijsu.2017.06.043
11. Subramanian B, Shastri N, Aziz L, et al. ASSIST - Patient satisfaction survey in postoperative pain management from Indian subcontinent. *J Anaesthesiol Clin Pharmacol*. 2017;33(1):40-47. doi:10.4103/joacp.JOACP_245_16
12. Kapoor R., Dua S., Saxena A. K., & Narayan S. (2023). Evaluation of the Efficacy of Intraperitoneal Instillation of Ropivacaine with Dexmedetomidine Versus Ropivacaine with Ketamine for Post Operative Pain Relief following Laparoscopic Cholecystectomy: A Randomized Controlled Study. *Archives of Anesthesiology and Critical Care*, *9*(Supplement), 411-417. doi: 10.18502/aacc.v9i5.13960
13. Ramsay MA. Acute postoperative pain management. *Proc (Bayl Univ Med Cent)*. 2000;13(3):244-247. doi:10.1080/08998280.2000.11927683
14. Christ M. Pain - the fifth vital sign. *Swiss Med Wkly*. 2020;150:w20215. doi:10.4414/smw.2020.20215
15. Shawky A, Essa A, Emam A. Effect of Intraperitoneal Ketamine as Postoperative Analgesia in Laparoscopic Cholecystectomy. *The Egyptian Journal of Hospital Medicine*. 201872(3): 4224-4229. doi: 10.21608/ejhm.2018.9142
16. Gordon DB, Dahl JL, Miaskowski C, et al. American pain society recommendations for improving the quality of acute and cancer pain management: American Pain Society Quality of Care Task Force. *Arch Intern Med*. 2005;165(14):1574-1580. doi:10.1001/archinte.165.14.1574
17. Botti M, Khaw D, Jørgensen EB, Rasmussen B, Hunter S, Redley B. Cross-cultural examination of the structure of the Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R). *J Pain*. 2015;16(8):727-740. doi:10.1016/j.jpain.2015.03.016
18. Chaw SH, Lo YL, Lee JY, et al. Evaluate construct validity of the Revised American Pain Society Patient Outcome Questionnaire in gynecological postoperative patients using confirmatory factor analysis. *BMC Anesthesiol*. 2021;21(1):20. doi:10.1186/s12871-020-01229-x
19. Fang H, Liang J, Hong Z, et al. Psychometric evaluation of the Chinese version of the revised American Pain Society Patient Outcome Questionnaire concerning pain management in Chinese orthopedic patients. *PLoS One*. 2017;12(5):e0178268. doi:10.1371/journal.pone.0178268
20. Boddy AP, Mehta S, Rhodes M. The effect of intraperitoneal local anesthesia in laparoscopic cholecystectomy: a systematic review and meta-analysis. *Anesth Analg*. 2006;103(3):682-688. doi:10.1213/01.ane.0000226268.06279.5a.
21. Babu R, Jain P, Sherif L. Intraperitoneal instillation: Ropivacaine vs. bupivacaine for postoperative pain relief in laparoscopic cholecystectomy. *Int J Health Sci Res*. 2013;3(12):42-47.
22. Bakri MH, Ismail EA, Ibrahim A. Comparison of dexmedetomidine and dexamethasone for prevention of postoperative nausea and vomiting after laparoscopic cholecystectomy. *Korean J Anesthesiol*. 2015;68(3):254-260. doi:10.4097/kjae.2015.68.3.254