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Original Research Article

Comparative Study on Hemodynamic Profile of Intraperitoneal Instillation of Ropivacaine versus Bupivacaine in Laparoscopic Surgeries

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Abstract:

Background: Inadequate pain relief in the postoperative phase is a well-known problem world-wide. A side from the suffering caused by insufficient pain relief, this is an issue with potential adverse physiological and psychological consequences for patients in addition to financial draw backs for caregivers. Poorly managed pain may interfere with postoperative complications, cause patient suffering and prolong recovery. Patients may anticipate future medical interventions with greater anxiety if pain has not been managed effectively in the past. Aim of this study to assess postoperative hemodynamics of intra peritoneal instillation of Ropivacaine and Bupivacaine in Laparoscopic surgeries.

Methods: The present study was conducted in the Department of Anaesthesiology at Darbhanga Medical College and Hospital, Laheriasarai, Bihar. The double blinded randomized experimental study was conducted from March 2023 to August 2023. The sample size of 50 study subjects was selected using the mean pain score at 3.6 with 80% power and 95% confidence interval. In each of the group 25 study subjects were allotted based on randomization. All patients were instilled with 30 ml of solution in a standardized manner by the operating surgeon under vision before removal of trocar at the end of the surgical procedure. Group R received 30 ml (0.2%) ropivacaine and group B received 30 ml (0.25%) bupivacaine. The drugs were prepared and given to the investigator who was blind to the identity of drugs.

Results: The heart rate was found to be comparable between two groups at 10 min, 30 Min, 60 Min, 120 Min, 4 Hrs, 8 Hrs, 12 Hrs and at 24 hrs and the p value was found to be non-significant. The Systolic Blood pressure was found to be statistically significant between the two groups at 10 Min, 30 Min, 60 Min, 120 Min, 4 hrs, 8 Hrs and 12 hrs. Whereas at 24 hrs the difference of Systolic Blood Pressure was found to be non-significant.

Conclusion: Heart rate was similar in both the study groups at various time intervals. Systolic blood pressure and diastolic blood pressure was significantly high among patients in Bupivacaine group measures in most of the time intervals, while mean blood pressure differences were inconsistent over the follow up period.

Keywords: Haemodynamic, Laproscopic, Blood pressure, Heart Rate.

Introduction

"The pain of surgery was torturous" said by Celsus in the pre anesthetic era. Pain is a Greek word derived from the name POINE, the Greek Goddess of revenge.

The International Association for the Study of Pain (IASP) defines Pain as ”an unpleasant sensory and emotional/affective and cognitive experience that is associated with actual or potential tissue damage or is described in terms of such damage”. [1] McCaffery defined pain as “what the patient says it is, and exists whenever the patient says it does”. International Association for the Study of pain has defined pain as an “unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain is always underestimated and under treated. Pain relief is an important goal of Anesthesia.

Any degree of pain is significant to a patient. It is argued that any amount of reduction in the pain is beneficial, when the treatment is not associated with any adverse effect. It makes a difference in duration of hospital stay and time of ambulation.

The highest achievable standard of health is enshrined in the 1948 Universal Declaration of Human Rights as a fundamental right of every human being (WHO, 2002). Post-operative Pain relief is part of that basic human right to health. [2]

Inadequate pain relief in the postoperative phase is a well-known problem world-wide. Aside from the suffering caused by insufficient pain relief, this is an issue with potential adverse physiological and psychological consequences for patients in addition to financial draw backs for caregivers. [3,4] Poorly managed pain may interfere with postoperative complications, cause patient suffering and prolong recovery. [3,4] Patients may anticipate future medical interventions with greater anxiety if pain has not been managed effectively in the past. [5] There are a number of risk factors for chronic pain after surgery and one of the most striking predictor is indeed the severity of acute postoperative pain. [6,7]

Material and Methods

A double blinded randomized experimental study was conducted in Department of Anaesthesiology at Darbhanga Medical College and Hospital, Laheriasarai, Bihar from March 2023 to August 2023.

A total of 100 Study subjects aged between 20 to 65 years of age of either sex, ASA risk I and II, undergoing laparoscopic surgeries under general anaesthesia comprised the study population.

Sample size was calculated to be 50 (25 in each group) using Open Epi software version 3.03, taking into consideration mean pain score of 3.6 with SD 2.5 in one group and mean 2.0 with SD 2.5 based on previous study with 80% power and 95% confidence interval.

All patients posted for surgery during the study period fulfilling the eligibility criteria were included. Patients were divided into two groups of 25 each, irrespective of age and gender for the proposed surgery by Randomization chart.

Patients whose age 18 to 60 years, ASA grade I and II (both male & female) and laparoscopic surgeries (with incision to closure time > 30 Mins) were included in this study.

Patients with age group < 18yrs, ASA III and IV, known allergy to drugs to be used, renal dysfunction and unable to comprehend VAS Score were excluded in this study.

All patients were instilled with 30 ml of solution in a standardized manner by the operating surgeon under vision before removal of trocar at the end of the surgical procedure.

Group R received 30 ml (0.2%) ropivacaine and group B received 30 ml (0.25%) bupivacaine. The drugs were prepared and given to the investigator who was blind to the identity of drugs.

Means and proportions were calculated for continuous and categorical data respectively. Difference in proportions was tested using chi square test. Tests of normality were carried out for continuous variables and Mann Whitney U test was carried out to test statistical difference in means between the study groups. A p value <0.05 was considered statistically significant. Data entry was done using MS Excel 2013 and data analysis was carried out using SPSS version 23.0

Results

A total of 50 study subjects were selected and 25 subjects were selected in each group by random allocating.

Both the study groups were comparable in terms of Age, Gender, BMI and ASA with no significant difference was observed between the groups.

Table1:Profileofstudysubjects

	Study group		p-value
	Ropivacainen(%)	Bupivacainen(%)	
Age group (in yrs.) • 18-30 • 31-45 • 46-65	 13(52.0) 7(28.0) 5(20.0)	 9(36.0) 8(32.0) 8(32.0)	0.476
Gender • Male • Female	 4(16.0) 21(84.0)	 6(24.0) 19(76.0)	0.480
ASA grade • I • II	 19(76.0) 6(24.0)	 21(84.0) 4(16.0)	0.480
BMI • Normal • Overweight and Obese	 22(88.0) 3(12.0)	 17(68.0) 8(32.0)	0.088

The heart rate was found to be comparable between two groups at 10 min, 30 Min, 60 Min, 120 Min, 4 Hrs, 8 Hrs, 12 Hrs and at 24 hrs and the p value was found to be non-significant with p value more than 0.05 at all the time intervals.

Table 2: Distribution of study groups based on Heart Rate at various intervals

Heart Rate	Ropivacaine (n = 25)		Bupivacaine (n = 25)		p-value*
	Median	IQR	Median	IQR	
10Min	78	72-82	78	75-80	0.775
30Min	76	72-81.5	76	72-80	0.822
60Min	74	69.5-82.5	74	72-79.5	0.719
120Min	76	70.5-82.5	78	73-83	0.312
4Hrs.	76	74-87	78	76-82	0.364
8Hrs.	79	72-85.5	80	76-86	0.412
12Hrs.	80	71.5-84.5	79	76-82	0.756
24Hrs.	79	75-83	78	76-81	0.718

***Mann Whitneyu test was applied for comparison of means**

The Systolic Blood pressure was found to be statistically significant between the two groups at 10 Min, 30 Min, 60 Min, 120 Min, 4 hrs, 8 Hrs and 12 hrs. Whereas at 24 hrs the difference of Systolic Blood Pressure was found to be non-significant.

Table 3: Distribution of study groups based on SBP at various intervals

SBP	Ropivacaine (n = 25)		Bupivacaine (n = 25)		p-value*
	Median	IQR	Median	IQR	
10Min	120	110-126	128	120-130	0.014
30Min	118	114-124	124	117.5-129	0.048
60Min	118	110-124	126	120-130	0.003
120Min	120	114-127	128	124-130	0.002
4Hrs.	124	118-128	130	124-135	0.002
8Hrs.	124	120-130	128	124-138	0.062
12Hrs.	124	119-128	130	124-134	0.005
24Hrs.	126	122-134	128	124-130	0.859

***Mann Whitneyu test was applied for comparison of means**

The Diastolic Blood pressure was found to be statistically significant between the two groups at 10 Min, 30 Min, 60 Min, 120 Min, 4 hrs and 12 hrs, whereas at 8 hrs and 24 hrs the difference of Diastolic Blood Pressure was found to be non-significant.

Table 4: Distribution of study groups based on DBP at various intervals

DBP	Ropivacaine (n = 25)		Bupivacaine (n = 25)		p-value*
	Median	IQR	Median	IQR	
10Min	70	70-77	76	70-79	0.032
30Min	72	68-77	76	72-80	0.093
60Min	74	69-78	76	73-80	0.034
120Min	74	69-78	78	74-80	0.010
4Hrs.	74	70-80	80	77-82	0.005
8Hrs.	78	71-80	80	76-80	0.175
12Hrs.	78	72-80	80	78-82	0.023
24Hrs.	80	78-82	80	78-80	0.612

Discussion

The present study was carried out as an attempt to compare the postoperative analgesic effects of intraperitoneal instillation of Ropivacaine and Bupivacaine in laparoscopic surgeries. The study was carried out as a double blind randomised control experiment among 50 Adult patients (20–65 years) of either sex, ASA risk I and II, undergoing laparoscopic surgeries under general anaesthesia. The study groups were comparable in terms of baseline characteristics like age, gender, MMS, ASA, BMI classification and duration of surgery. Heart rate was similar in both the study groups at various time intervals.

However, systolic blood pressure and diastolic blood pressure was significantly high among

patients in Bupivacaine group measures in most of the time intervals. Meena RK et al. [8] noted in the study that HR, SBP and DBP were comparatively lower in Group-R than in Group-B. The VAS score was significantly lower in Group-R from postoperative 5th hr. to 12th hr. Rescue analgesia was given when VAS was > 40. VRS score was significantly lower in Group-R from postoperative 7th hr., showing longer duration of analgesia in this group. The rescue analgesia requirement was also less in Group-R. A comparable result was noted in the present study also, where lower VAS scores were noted from 8 hours and after, in patients who received Ropivacaine. Babu R et al. [9] study reported revealed that the age and sex distribution of both the groups was similar. The heart rate, systolic & diastolic blood pressure, mean blood pressure and mean trend of SpO2 in both groups remained similar over the periods.

Porika S et al. [10] study findings reported that there was no significant difference in age and weight between the two groups. Intraoperatively statistically significant differences were observed SBP - At 15 and 30 min post nebulization and at extubation. No significant differences were observed with respect to DBP and HR. Postoperatively DBP and HR differences were found to be statistically significant at 4th post-operative hour. There were no statistically significant differences in SBP and MAP between both the groups.

Conclusion

The study groups were comparable in terms of baseline characteristics like age, gender, MMS, ASA, BMI classification and duration of surgery. Heart rate was similar in both the study groups at various time intervals. Systolic blood pressure and diastolic blood pressure was significantly high among patients in Bupivacaine group measures in most of the time intervals, while mean blood pressure differences were inconsistent over the follow up period.

References

1. Goldstein A, Grimault P, Henique A, Keller M, Fortin A, Darai E. Preventing postoperative pain by local anesthetic instillation after laparoscopic gynecologic surgery: a placebo-co ntrolled comparison of bupivacaine and ropivacaine. AnesthAnalg. 1994;91(2):403–7.
2. Brennan F, Cousins MJ. Pain relief as a human right. Pain Clin Updates. 1994;12(5):1–4.
3. Bardiau FM, Taviaux NF, Albert A, Boogaerts JG, Stadler M. An intervention study to enhance postoperative pain management. AnesthAnalg. 1996;96(1):179–85.
4. Bedard D, Purden MA, Sauve-Larose N, Certosini C, Schein C. The pain experience of post-surgical patients following the implementation of an evidence-based approach. Pain ManagNurs. 1996;7(3):80–92.
5. Twycross A. Educating nurses about pain management: the way forward. J ClinNurs. 1997;11(6):705–14.
6. Kehlet H, Jensen TS, Woolf CJ. Persistent postsurgical pain: risk factors and prevention. Lancet. 1997;367(9522):1618–25.
7. Perkins FM, Kehlet H. Chronic pain as an outcome of surgery. A review of predictive factors. Anesthesiol. 1998;93(4):1123–33.
8. Meena R, Meena K, Loha S, Prakash S. A comparative study of intraperitoneal ropivacaine and bupivacaine for postoperative analgesia in laparoscopic cholecystectomy: a randomized controlled trial. Anaesth Pain Intensive Care. 2017;20(3):295–30.
9. Babu R, Jain P, Sherif L. Intraperitoneal instillation: ropivacaine vs bupivacaine for postoperative pain relief in laparoscopic cholecystectomy. Int J Health Sci Res. 2017;3(12):42–7.
10. Porika TS. Intraperitoneal nebulization of ropivacaine 0.75% vs intraperitoneal nebulization of bupivacaine 0.5% for post-operative analgesia in laparoscopic surgeries: Prospective double blinded randomised controlled trial. Int Arch Integrated Med. 2018;5(9):105–17.