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EFFECT OF PREINCISIONAL LEVOBUPIVACAINE INFILTRATION ON POSTOPERATIVE RECOVERY IN PATIENTS UNDERGOING GENERAL ANAESTHESIA

Dr. Rajashree Paul[1], Dr. Mamtaz A[2], Dr. M. Sarath Chandra[3], Dr. Anand G Valu[4*]
[1]Assistant Professor, Department of Anaesthesiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.
[2]Assistant Professor, Department of Anaesthesiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.
[3]Assistant Professor, Department of Anaesthesiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.
[4*]Assistant Professor, Department of Anaesthesiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.
Corresponding Author: Dr. Anand G Valu
Assistant Professor, Department of Anaesthesiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.
E Mail: guruanandvalug@yahoo.co.in

Abstract

Introduction: Pain has been a major concern of humankind since our beginning and it has been the object of ubiquitous efforts to understand and to control it. Providing comfort to the patient by prevention and relief of pain and monitoring and maintenance of normal physiology during the perioperative period is the primary goal of an anaesthetist. Limited literature is available on the use levobupivacaine in appendicectomy patients. We explored the effects of pre incisional levobupivacaine in the peri incisional site in patients undergoing appendicectomy under general anaesthesia on post operative recovery and VAS score.

Materials and Methods: A Prospective clinical study was conducted for one year from July, 2015 to June, 2016. 120 adult patients of ASA I and II scheduled for elective abdominal surgeries under general anaesthesia in Assam Medical College and Hospital, Dibrugarh were selected for the study. Patients were selected after thorough pre-anaesthetic assessment and investigations. 120 patients were divided into two groups, A and B, with 60 cases in each group by matching patient's age, sex, weight, Mallampati and ASA grading. Group A: Preincisional levobupivacaine infiltration along the incision line done**.** Group B: Preincisional infiltration with normal saline along the incision line done.

Results: The age distribution in the group A and group B is shown in TABLE 6.1. The age range is 20-50 years for both the study groups. The mean age and standard deviation of patients in group A was 32.83 and 8.96 and in group B was 34.43 and 8.53 with a p-value of 0.202 (>0.05) suggesting that both the groups had comparable demographic feature i.e. There was no significant difference in age between the two groups. The mean weight and standard deviation in group A was 55.11 and 7.42Kg and in group B was 55.63 and 6.99Kg with p-value of 0.695 (>0.05) which is not significant, suggesting mean weight was also comparable in both the groups. The mean baseline hemodynamic parameters of both groups were comparable as the p-value was greater than 0.05. Readings were taken at baseline, 40 minutes, 60 minutes and 6 hours. All parameters showed an increasing trend at the 40^{th} and 60^{th} minute, but the increase was more prominent in Group B.

Conclusion: Overall, the experience with levobupivacaine was quite satisfactory as compared to the normal saline group. The results of this study clearly indicate the effectiveness of preincisional levobupivacaine infiltration on post operative recovery in patients undergoing general anaesthesia. Levobupivacaine has a definitive edge in providing analgesia in the early post operative period.

Key Words: Pain, VAS score, appendicectomy, general anaesthesia, Levobupivacaine.

INTRODUCTION

Pain has been a major concern of humankind since our beginning and it has been the object of ubiquitous efforts to understand and to control it. Providing comfort to the patient by prevention and relief of pain and monitoring and maintenance of normal physiology during the perioperative period is the primary goal of an anaesthetist.[1]

Pain is a predictable consequence of surgery. Pain relief is a critical factor in a patient's recovery from anesthesia and surgery. For these reasons, effective postoperative analgesia is a key component of perioperative care. Because the pain management paradigm has shifted to an increasing use of multimodal analgesia, the role of local anesthetics has taken on greater significance. Infiltration of local anesthetics into the surgical site at the time of wound closure is one aspect of a multimodal approach for postoperative analgesia today.[2]

The technique of injecting local anesthetics into the various layers of the surgical incision (wound) is a commonly used practice in general anesthesia surgical cases. It is relatively inexpensive, technically not difficult, and may potentially reduce the post-operative discomfort. There are two main approaches to local anesthetic wound infiltration.[3] The first, a preemptive model applies the anesthetic prior to surgical incision. The second model applies the anesthetic immediately prior to surgical closure at the end of the surgical case. Injecting local anesthetics prior to surgical incision into the surgical wound has been more extensively studied but the results in this area are mixed.[4]

Keeping this in mind, a prospective clinical study was conducted with an aim to evaluate the analgesic effects of levobupivacaine when used as infiltration, as an adjuvant to general anaesthesia in patients undergoing abdominal surgeries.[5] Limited literature is available on the use levobupivacaine in appendicectomy patients. We explored the effects of pre incisional levobupivacaine in the peri incisional site in patients undergoing appendicectomy under general anaesthesia on post operative recovery and VAS score.

MATERIALS AND METHODS

Place of Study: The present study was conducted in the Department of Anaesthesiology, Assam Medical College and Hospital, Dibrugarh for a period of one year.

Design of Study: A Prospective clinical study.

Source of Data: Adult patients undergoing elective abdominal surgery under general anaesthesia at different operation theatres of Assam Medical College and Hospital, Dibrugarh.

Study Period: One year from July, 2015 to June, 2016.

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Sample Size: 120 adult patients of ASA I and II scheduled for elective abdominal surgeries under general anaesthesia in Assam Medical College and Hospital, Dibrugarh were selected for the study.

Following criteria was adopted for selecting patients.

Inclusion Criteria:

- Patients scheduled for elective surgeries
- Patients aged between 20-50 years of both the sexes.
- Patients with ASA Grade I or II (ASA Grade I- normal healthy patient, ASA Grade II-patient with mild systemic disease).

Exclusion Criteria:

- Patients with extensive peritonitis and midline incisions. Emergency surgeries.
- Patients with ASA Grade III or higher.
- Patients on psychotropic drugs or history of drug allergies.
- Difficult intubation.
- Previous records of failed intubation
- Patients not willing to participate in the study.

Ethical Clearance: Ethical clearance was obtained from the Institutional Ethics Committee (H) of Assam Medical College and Hospital, Dibrugarh. Informed consent was taken from each of the participants.

Methodology: Patients were selected after thorough pre-anaesthetic assessment and investigations. 120 patients were divided into two groups, A and B, with 60 cases in each group by matching patient's age, sex, weight, Mallampati and ASA grading.

Group A: Preincisional levobupivacaine infiltration along the incision line done

Group B: Preincisional infiltration with normal saline along the incision line done

Plan of Study: Complete pre-anaesthetic evaluation was performed for each patient including detailed history taking, thorough physical examination and routine preoperative investigations including coagulation profile. This was recorded in the proforma attached herewith. The nature and procedure of the study was explained to the patients. All patients had routine preoperative fasting for 6 hours the night before surgery. Following parameters were noted during the operation: Heart rate, Systolic BP, Diastolic BP, Mean Arterial Pressure, Peripheral oxygen saturation, Administered Fentanyl doses, Adverse effect like straining, cough, nausea and vomiting, laryngo bronchospasm.

Investigations: Haemoglobin, TC, DC and ESR, RBS, BT, CT, PT and INR, Blood urea, serum creatinine and Liver function test, ECG, Chest x-ray.

Patient's Preparation: The patient was visited in the ward for pre anaesthetic check up in the evening before the day of surgery. The patient was explained about the study procedure and an informed consent was taken. Each patient received bowel cleansing procedure and

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Tab. Alprazolam 0.5mg the night before surgery. Patients were kept nil orally until the surgery the next day.

On arrival of the patient in the operation room, standard monitors were applied. SPO2, ECG and heart rate were monitored continuously and non- invasive recordings of systolic, diastolic and mean arterial pressure at 5 min intervals were taken. An IV line was started with RL after securing an 18G cannula. The patient was premedicated with Glycopyrrolate (0.2mg), Ondansetron (4mg), Pantoprazole (40 mg), Fentanyl (2 micro g/kg).

Pain measurement scale was described to patients before surgery. Patients marked the severity of their pain from 0 to 10. 0 (zero) indicates absence of pain, and 10 is an unbearable pain. Postoperative recovery of patients was evaluated with the Modified Aldrete Scoring (MAS) system. After the value of MAS reaches ≥9, patients were shifted from the operating room and this time was recorded (3); 2 mg/kg of diclofenac was injected intramuscularly as rescue analgesic in patients whose VAS scores ≥4.

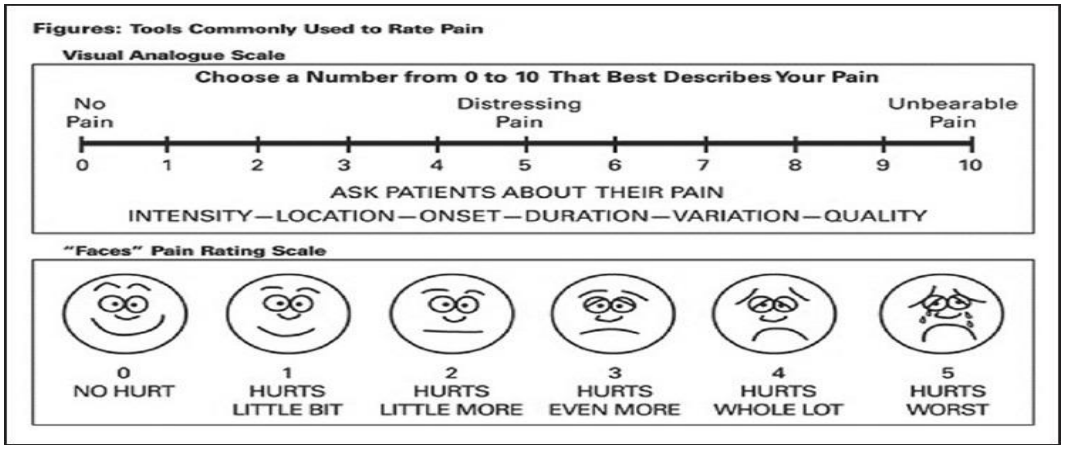


Figure 1: Visual Analogue scale

Procedure: The patient was preoxygenated with 100% oxygen for 3 minutes before induction with a tight fitting facemask. Anaesthesia was induced with inj. Propofol (2mg/kg) and administered slowly till the loss of response to verbal commands and then Inj. Succinylcholine was administered at a dose of 1.5mg/kg i.v.

Laryngoscopy was done using rigid laryngoscope with standard Macintosh blade. Intubation was done with appropriate sized disposable, high volume low pressure cuffed endotracheal tube. After confirming the position of the tube patient was ventilated with 66% nitrous oxide and 33% oxygen with a tidal volume of 8-10 ml/kg and a respiratory rate of 12-15 breaths per minute. Maintenance of anaesthesia was done using relaxant Inj. Atracurium loading dose (0.5mg/kg) followed by maintenance dose (one-fifth of loading dose) as and when required along with inhalational agent Isoflurane (1%). Patient's pulse rate, MAP, SPO2 were monitored. A total of 20 ml 0.25% (50 mg) levobupivacaine was infiltrated subcutaneously along the incision line before surgery to Group A patients. A total of 20 ml normal saline (0.9%) was infiltrated along the incision line in group B patients. Surgery started after 5 minutes. Fifteen minutes before the estimated time of end of surgery, inhalational agent was cut off. Residual neuromuscular blockade was reversed with Inj. Neostigmine 0.05 mg/kg and Inj. Glycopyrrolate 0.01 mg/kg I.V. When patient's respiration was regular, suctioning and extubation was done after evaluating adequate reversal of non depolarizing muscle

relaxant. Occurrence of any event like straining, cough, nausea and vomiting, laryngo-bronchospasm was noted.

Preoperative VAS score, postoperative VAS score, HR, SBP, DBP and MBP was recorded at baseline, 40^{th} and 60^{th} minute and 6 hours, discharging time from operation room (in minutes), Postoperative 1^{st}, 6^{th}, 12^{th} and 24^{th} hour Visual Analogue Scale (VAS) score, First analgesic required time (hours) and necessity of Diclofenac injection i.m. as rescue analgesic within first 24 hours was recorded.

Statistical Analysis: Quantitative variables like heart rate (HR), systolic BP, diastolic BP, mean BP and VAS (visual analogue score) were tabulated as Mean ± SD and qualitative data were presented in percentages. Comparison between the groups were analysed by Unpaired student t-test. For Qualitative data Chi-Square test or Fischer's exact test was used to determine p value. For all tests, p value of less than 0.05 was considered significant. Microsoft Excel and Microsoft Word have been used to generate graphs and tables.The data obtained was subjected to statistical computation using statistical package for social science (SPSS) version 20.0.

RESULTS

The present work is a prospective clinical study to determine the effects of preincisional 0.25% levobupivacaine infiltration on postoperative recovery and visual analogue scale (VAS) score in major surgeries under general anaesthesia and to compare it with normal saline group. The study was conducted under the Department of Anaesthesiology and Critical Care, Assam Medical College and Hospital, during the period July 2015 to June 2016. For this purpose, 120 patients of either sex, between 20- 50 years, of ASA I & II physical status were selected after obtaining informed and written consent, and were divided into two groups of 60 each namely group A and group B. Group A received preincisional levobupivacaine infiltration along the incision line and group B received preincisional infiltration with normal saline along the incision line.

The data was recorded on a predesigned and pretested proforma. After all the data were collected, it was tabulated and a master chart was prepared. The data acquired was analyzed as below. The results and observations of the cases in the study are shown in the following tables and figures and explained thereby.

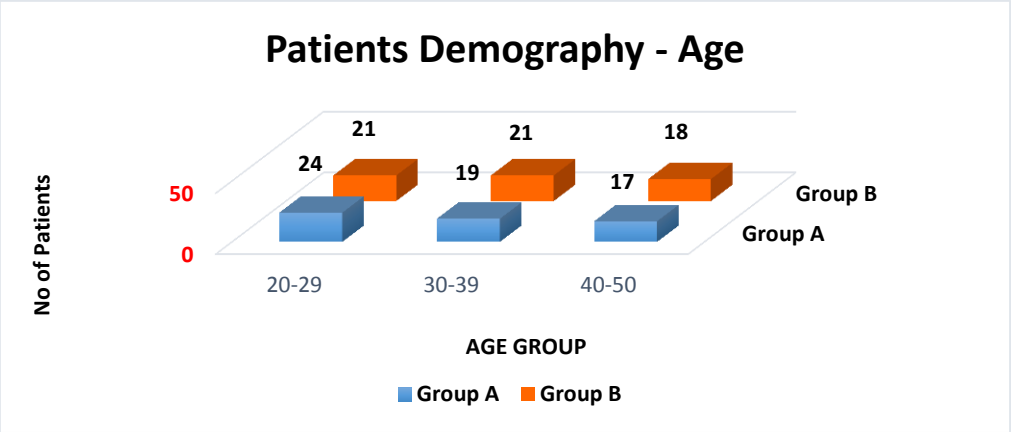
Table 1: Age Distribution

Age (years)	Group A		Group B	
	Number	% in Group	Number	% in Group
20-29	24	40	21	35
30-39	19	31.67	21	35
40-50	17	28.33	18	30
Mean ± SD	32.83 ± 8.96		34.43 ± 8.53	
p-value	0.202			

The age distribution in the group A and group B is shown in TABLE 6.1. The age range is 20-50 years for both the study groups. The mean age and standard deviation of patients in group A was 32.83 and 8.96 and in group B was 34.43 and 8.53 with a p-value of 0.202

(>0.05) suggesting that both the groups had comparable demographic feature i.e. There was no significant difference in age between the two groups.

Figure 2: Age Distribution

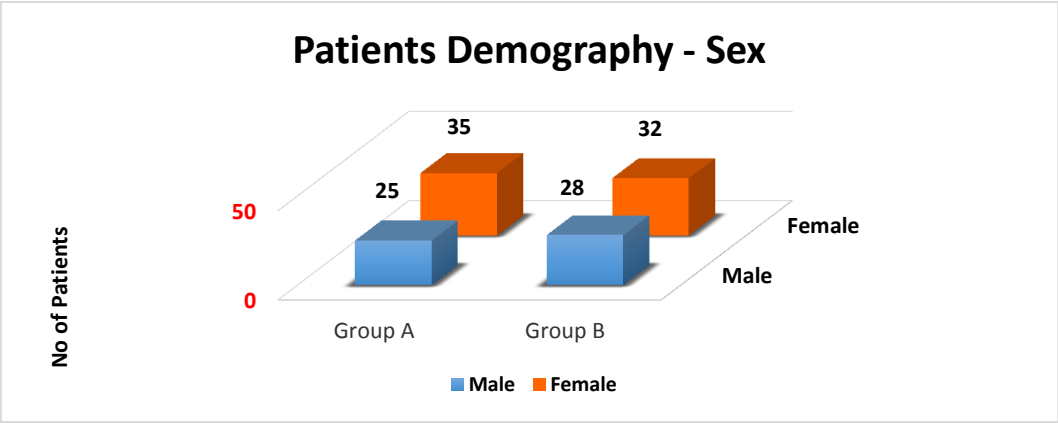


From the above graph it is seen that majority of the patients are in the age group of 20-29 years of age in both the groups. The number of patients in the age group of 20-29 is 24 in group A and 21 in group B, in the age group 30-39 it is 19 in group A and 21 in group B and in the age group 40-50 it is 17 and 18 in group A and B respectively.

Table 2: Gender Distribution

Sex	Group A		Group B	
	Number	% in Group	Number	% in Group
Male	25	41.67	28	46.67
Female	35	58.33	32	53.33

Figure 3: Gender Distribution

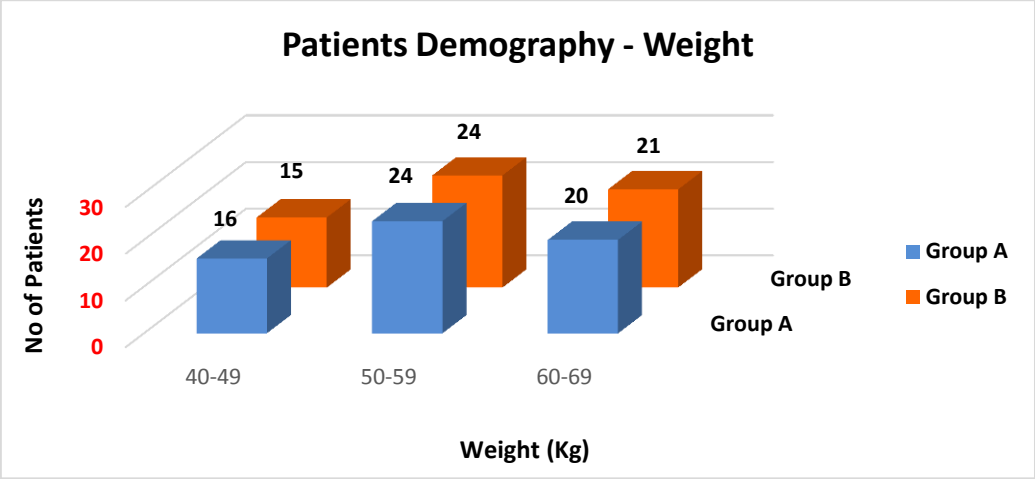


Here, 41.67% were males and 58.33% were females in Group A and 46.67% were males and 53.33% were females in group B. Hence, both the groups had comparable sex distribution.

Table 3: Weight Distribution

Weight (Kg)	Group A		Group B	
	Number	% in Group	Number	% in Group
40-49	16	26.67	15	25
50-59	24	40	24	40
60-69	20	33.33	21	35
Mean ± SD	55.11 ± 7.42		55.63 ± 6.99	
p-value	0.695			

Figure 4: Weight Distribution

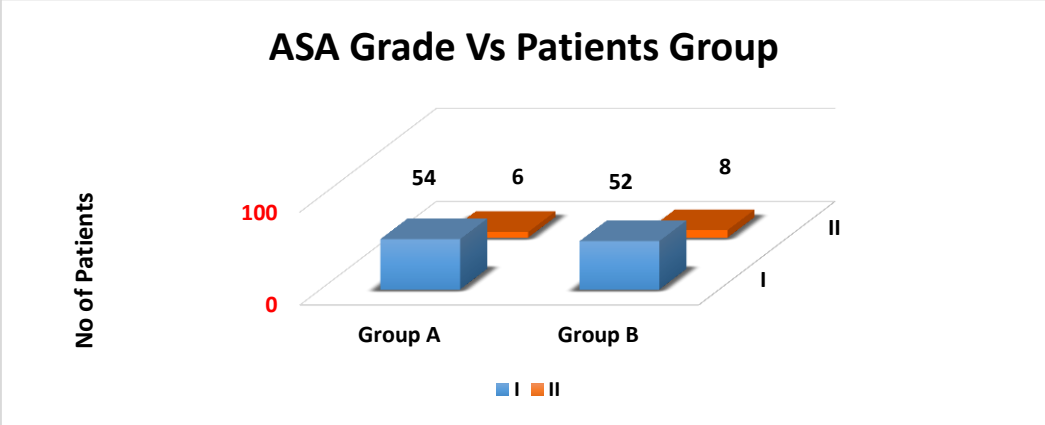


The mean weight and standard deviation in group A was 55.11 and 7.42Kg and in group B was 55.63 and 6.99Kg with p-value of 0.695 (>0.05) which is not significant, suggesting mean weight was also comparable in both the groups.

Table 4: ASA Distribution

Group	ASA Grade I		ASA Grade II	
	Number	% in Group	Number	% in Group
Group A	54	90	6	10
Group B	52	86.67	8	13.33
Total	106	88.33	14	11.67
p-value	0.777			

Figure 5: ASA Distribution



Of the 120 patients, 90% of patients belonged to ASA grade I and 10 % belonged to ASA grade II physical status in group A. In group B 86.67% were of ASA I and 13.33% patients belonged to ASA II. The p-value was 0.777 hence; both the groups were comparable with respect to ASA physical status.

Table 5: Operation Time Distribution

Operation Time (Mins)	Group A		Group B	
	Number	% in Group	Number	% in Group
25-29	29	48.33	29	45.33
30-34	18	30	15	25
35-39	10	16.67	8	13.3
40-45	3	5	8	13.3
Mean ± SD	29.36 ± 5.24		31.1 ± 6.34	
p-value	0.105			

Figure 6: Operation Time Distribution

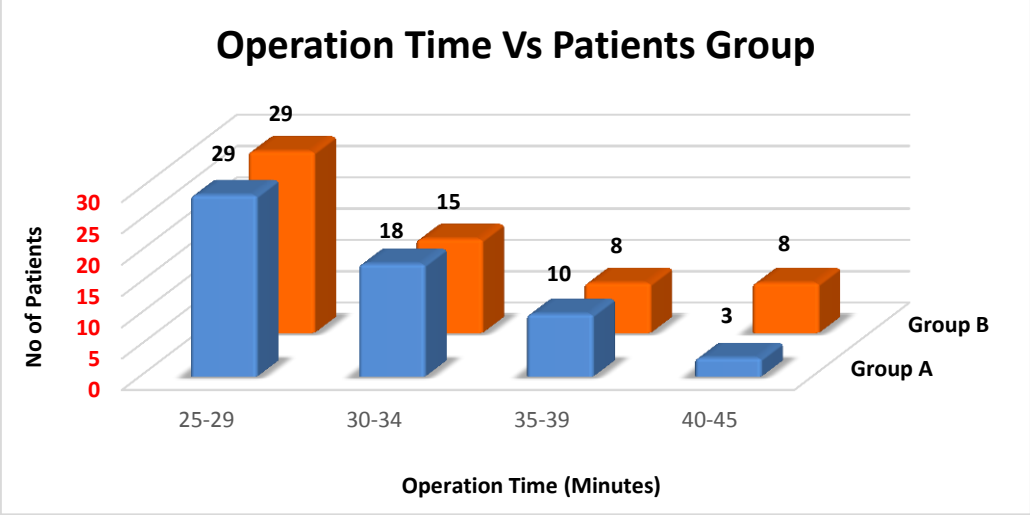


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Table 6: Demographic Features of Patients (Mean±SD)

DEMOGRAPHIC FEATURES	Group A	Group B
Age (years)*	32.83 ± 8.96	34.43± 8.53
Gender (Male/ Female)	25/35	28/32
Weight (Kilograms)*	55.11 ± 7.42	55.63 ± 6.99
ASA^{+} (I -II)	54/6	52/8
Operation time (minutes)*	29.36± 5.24	31.1± 6.34

*mean±SD

Table 7: Comparison of VAS (Visual Analogue Scale) Score

Parameters	Group A	Group B	p-value
Preoperative VAS score	0.3 ± 0.53	0.4 ± 0.58	0.330
Postoperative VAS score	1.78± 0.61	2.45± 0.99	0.000
Postoperative first hour VAS score	2.00± 0.58	2.46± 0.74	0.000
Postoperative first Six hours VAS score	2.15 ± 0.44	2.38± 0.61	0.018
Postoperative first Twelve hours VAS score	2.10± 0.39	2.38± 0.52	0.002
Postoperative first Twenty-Four hours VAS score	1.65± 0.46	1.93± 0.41	0.001

Table 8: Comparison of Discharging Time and Diclofenac necessity

Parameters	Group A	Group B	p-value
Discharging time from operation room (minutes)	7.03 ± 1.49	7.68 ± 1.71	0.028
Necessity of Diclofenac in first 24 hours	0.10 ± 0.30	0.63 ± 1.14	0.001
First Analgesic Required Time (hours)	11.33 ± 1.86	2.86 ± 1.59	0.000

Table 9: Comparison of Haemodynamic Parameters

Parameters	Group A	Group B	p-value
Baseline HR	72.55 ± 3.63	73.98 ± 5.19	0.082
Baseline Systolic Pressure	115.46 ± 5.20	117.13 ± 5.59	0.093
Baseline Diastolic Pressure	73.95 ± 4.81	75.61 ± 5.44	0.078
Baseline MBP	88 ± 4	89.45 ± 5	0.061
HR at 40 Minutes	82 ± 3.33	100.5 ± 8.11	0.000
Systolic Pressure at 40 Minutes	122.31 ± 3.31	137.16 ± 5.62	0.000
Diastolic Pressure at 40Minutes	81.93 ± 3.35	90.61 ± 4.69	0.000
MBP at 40 Minutes	95 ± 3	105.68 ± 5	0.000
HR at 60 Minutes	80.85 ± 2.26	98.25 ± 6.75	0.000
Systolic Pressure at 60 Minutes	121.43 ± 2.16	134.91 ± 5.32	0.000
Diastolic Pressure at 60 Minutes	81.11 ± 2.19	89.45 ± 4.12	0.000

MBP at 60 Minutes	94 ± 2	104.16 ± 5	0.000
HR at 6 Hours	72.71 ± 1	74.41 ± 6	0.067
Systolic Pressure at 6 Hours	115.13 ± 5.22	116.88 ± 5.49	0.076
Diastolic Pressure at 6 Hours	74.16 ± 4.77	75.95 ± 5.54	0.061
MBP at 6 Hours	87.5 ± 3.96	88.92 ± 4.24	0.060

Deviation of Hemodynamic parametersfrom Baseline

Table 10: Deviation of Heart Rate from Baseline

HR	Group A	Deviation from Baseline – Group A	Group B	Deviation from Baseline – Group B
Baseline HR	72.55	0	73.98	0
HR at 40 Minutes	82	9.45	100.5	26.52
HR at 60 Minutes	80.85	8.3	98.25	24.27
HR at 6 Hours	72.71	0.16	74.41	0.43

Figure 7: Deviation of Heart Rate from Baseline

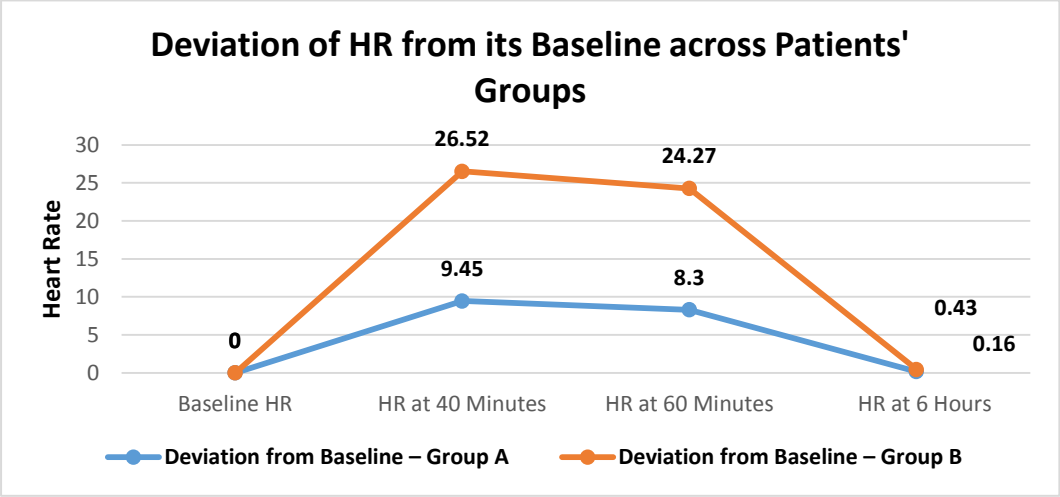


Table 11: Deviation of Systolic Pressure from Baseline

Systolic Pressure	Group A	Deviation from Baseline – Group A	Group B	Deviation from Baseline – Group B
Baseline Systolic Pressure	115.46	0	117.13	0
Systolic Pressure at 40 Minutes	122.31	6.85	137.16	20.03
Systolic Pressure at 60 Minutes	121.43	5.97	134.91	17.78
Systolic Pressure at 6 Hours	115.13	0.33	116.88	0.25

Figure 8: Deviation of Systolic Pressure from Baseline

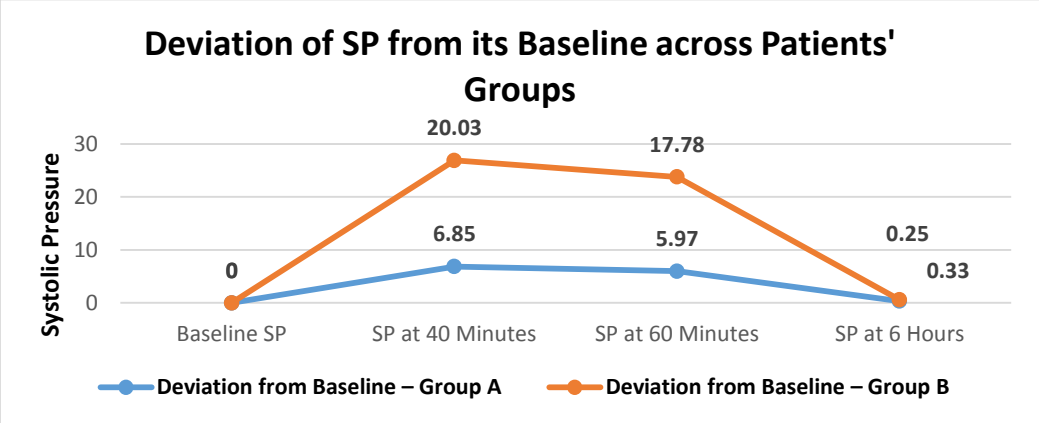


Table 12: Deviation of Diastolic Pressure from Baseline

Diastolic Pressure	Group A	Deviation from Baseline – Group A	Group B	Deviation from Baseline – Group B
Baseline Diastolic Pressure	73.95	0	75.61	0
Diastolic Pressure at 40 Minutes	81.93	7.98	90.61	15
Diastolic Pressure at 60 Minutes	81.11	7.16	89.45	13.84
Diastolic Pressure at 6 Hours	74.16	0.21	75.95	0.34

Table 13: Deviation of MBP from Baseline

Mean Blood Pressure	Group A	Deviation from Baseline – Group A	Group B	Deviation from Baseline – Group B
Baseline MBP	88	0	89.45	0
MBP at 40 Minutes	95	7	105.68	16.32
MBP at 60 Minutes	94	6	104.16	14.88
MBP at 6 Hours	87.5	0.5	88.92	0.53

The mean baseline hemodynamic parameters of both groups were comparable as the p-value was greater than 0.05. Readings were taken at baseline, 40 minutes, 60 minutes and 6 hours. All parameters showed an increasing trend at the 40^{th} and 60^{th} minute, but the increase was more prominent in Group B.

Figure 9: Mean SP Vs Patients Groups at different intervals

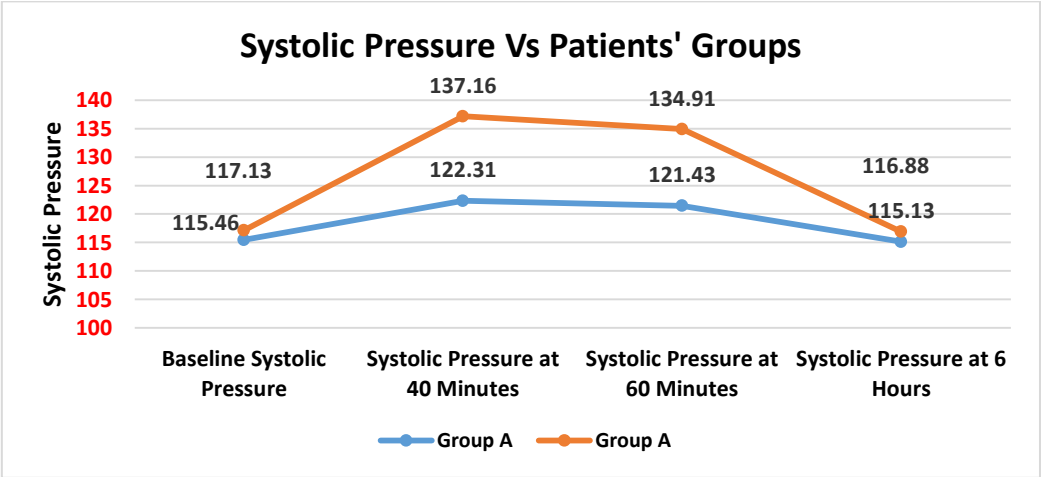


Figure 10: Mean DP Vs Patients Groups at different intervals

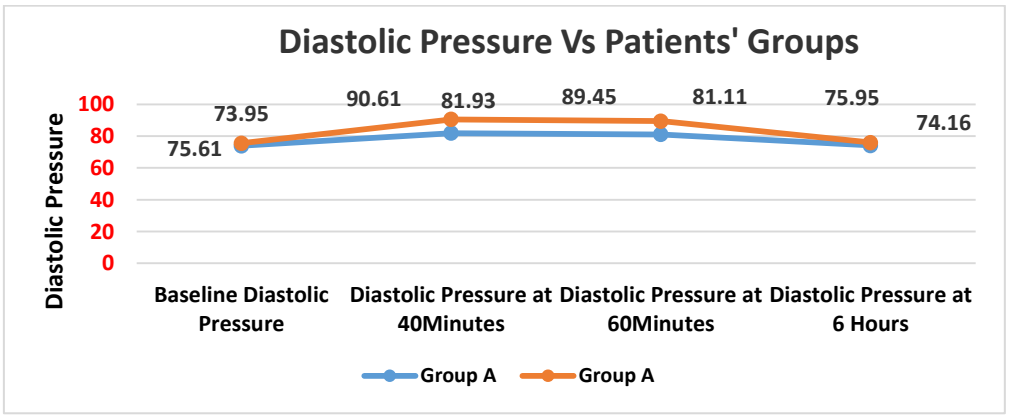


Figure 11: Mean MBP Vs Patients Groups at different intervals

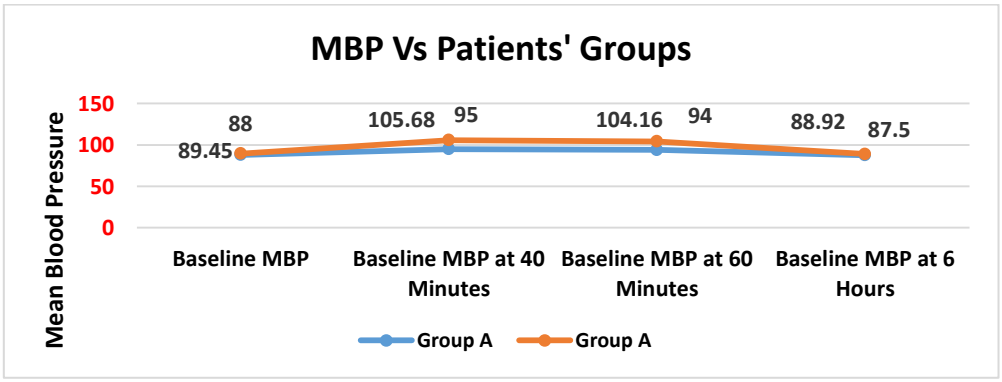


Figure 12: Mean VAS Score Vs Patients Groups At Different Intervals

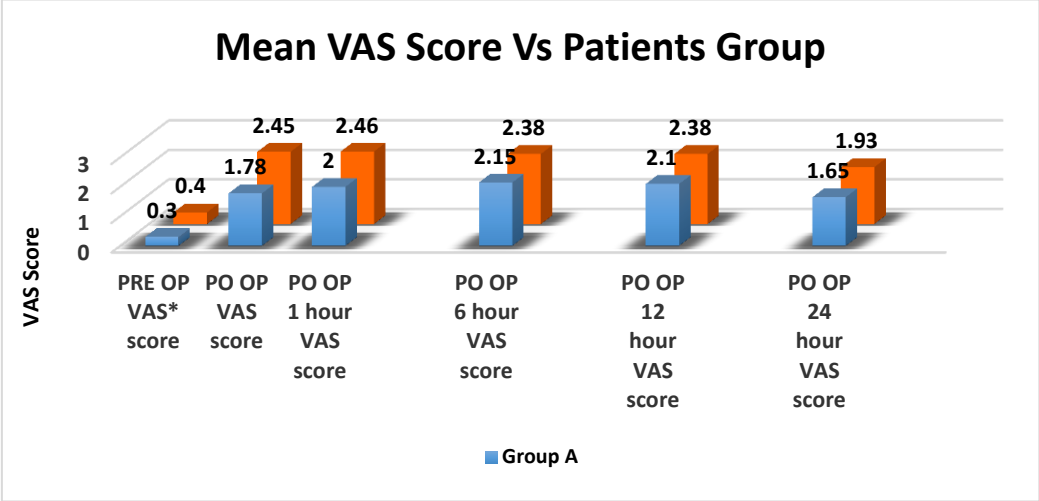


Figure 13: Distribution of Diclofenac Doses across Patients' Groups

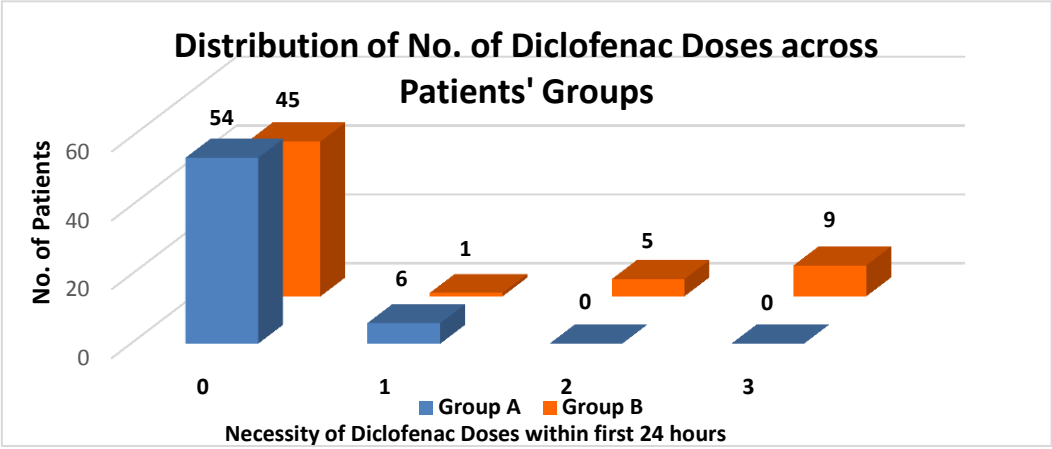
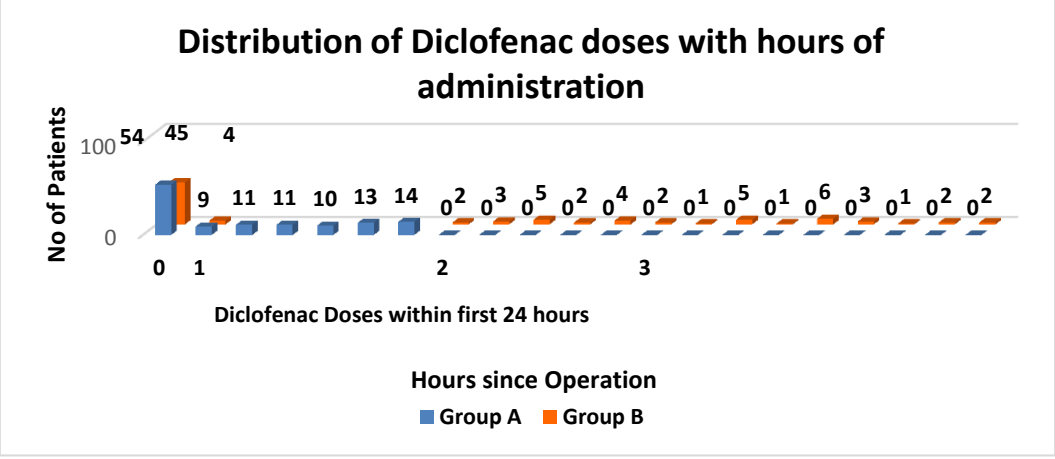


Figure 14: Distribution of Diclofenac Doses across Patients' Groups



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DISCUSSION

Carl Schleich (1859-1922) introduced infiltration local anesthesia in 1892 as an alternative to direct injection of nerve trunks. His method was to infiltrate cocaine in dilute concentrations (0.01% to 0.2%) directly into subcutaneous tissues.[105]

The technique of injecting local anesthetics into the various layers of the surgical incision (wound) is a commonly used practice in general anesthesia surgical cases. Surgical wound infiltration with local anesthetics has continued to increase in popularity since the mid 1990's. It is relatively inexpensive, technically not difficult, and may potentially reduce the post operative discomfort. There are two main approaches to local anesthetic wound infiltration. The first is a preemptive model which applies the anesthetic prior to surgical incision. The second model applies the anesthetic immediately prior to surgical closure at the end of the surgical case. Several studies have applied both models and administered local anesthetic both prior to and at closure. Injecting local anesthetics prior to surgical incision into the surgical wound has been more extensively studied. The results in this area are mixed with several studies showing significant pain reduction while other studies did not find a reduction in pain or had mixed results.[6]

The present study was undertaken to determine the effect of preincisional levobupivacaine infiltration on post operative recovery in patients undergoing general anaesthesia at Assam Medical College during the period July 2015 to June 2016.

The objective of this study was to determine the evidence base for the use of local anaesthetic infiltration at the beginning of surgery, prior to wound incision and its effectiveness in pain reduction using a VAS score, post operative recovery and a reduction in post-operative diclofenac consumption. The technique of injecting local anesthetics prior to surgical incision peri incisionally after the patient has been intubated was used.[8]

This prospective clinical study was planned with 120 patients of ASA I & II physical status, of either sex, aged between 20-50 years scheduled to undergo major abdominal surgeries under general anaesthesia and satisfying all the inclusion criteria were enrolled in the study. Patients were divided into two groups of 60 each by matching patient's age, sex, weight, Mallampati and ASA grading. Group A (n=60) patients received preincisional levobupivacaine infiltration. Group B (n=60) patients received preincisional normal saline infiltration before starting surgery post intubation.[9]

The demographic profile of the current study was comparable to similar other studies and did not show any statistical significance on comparison.

AGE: All the patients belonged to the age group of 20-50 years. 24 patients in group A and 21 in group B were between 20-29 yrs, 19 in group A and 21 in group B were between 30-39 yrs, 17 in group A and 18 in group B were between 40-50 yrs. The mean age in group A was 32.83 ± 8.96 yrs and in group B was 34.43 ± 8.53 yrs. Age indices between the groups were comparable.[10]

SEX: Group A had 25 male patients (41.67%) and 35 female patients (58.33%), whereas group B has 28 male patients (46.67%) and 32 female patients (53.33%).[11]

WEIGHT: Weight of each patient was noted**.** The mean weight in group A was 55.11±7.42 kg and in group B was 55.63±6.99 kg. Mean weight between the two groups was comparable. (t=0.695, P>0.05). Hence all the demographic parameters were comparable in both the

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groups.[12]

ASA GRADING: In group A 54 patients belonged to ASA I and 6 patients belonged to ASA II. In group B 52 patients belonged to ASA I and 8 patients belonged to ASA II. Both group were comparable with regards to ASA grading, showing no statistical significance.[13]

In the operation theatre, on arrival of the patient, standard monitors were connected. Baseline heart rate, systolic blood pressure, diastolic blood pressure was recorded. Pre operative VAS score was taken from the patient. 18 g IV cannula was secured and ringers lactate solution started. Skin infiltration was done with 0.25% levobupivacaine or 0.9% normal saline. Patients in group A received 20 ml 0.25% preincisional levobupivacaine and group B received 20 ml of 0.9% normal saline peri incisionally five minutes before the incision.

The statistical analysis done by students unpaired t-test shows that the difference was statistically significant. ($P<0.05$)

OPERATION TIME: The mean duration of surgery in group A was 29.36±5.24 min and in group B was 31.1±6.34 min. Statistical analysis using students unpaired t test showed that there was no statistically significant difference between the groups. ($t=0.105$, $P>0.05$)

Visual analogue scale (VAS) score: Intensity of pre and post operative pain and quality of relief of pain was assessed using visual analog scale, and analgesia was provided with diclofenac injection i.m. when VAS score was equal or above 4.

IN GROUP A 0 patients needed rescue analgesia in 0 hour.

- 0 patients needed rescue analgesia in 1 hour.
- 0 patients needed recue analgesia in 6 hours.
- 4 patients needed rescue analgesia in 12 hours
- 6 patients needed rescue analgesia in 24 hours.

IN GROUP B

- 0 patients needed analgesia in 0 hour.
- 3 patients needed rescue analgesia in 1 hour
- 15 patients needed rescue analgesia in 6 hours.
- 15 patients needed rescue analgesia in 12 hours.
- 15 patients needed recue analgesia in 24 hours.

TIME TAKEN FOR NEED OF FIRST RESCUE ANALGESIC: In group A time taken for need of first rescue analgesia was 11.33±1.86 hours and in group B was 2.86±1.59 hours. Statistical analysis by students unpaired t-test shows that this difference is significant ($P<0.001$)

HAEMODYNAMIC PARAMETERS: The haemodynamic parameters, as evident from above tables remained more stable for group A which reaffirms the established effects of levobupivacaine in providing a haemodynamically stable peri-operative and post-operative

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period.[14]

- In the present study heart rate, blood pressure (systolic & diastolic) and mean blood pressure of all the patients at base line, 40 min, 60 min and at 6 hours was monitored.

- The baseline mean heart rate was 72.55±3.63 in group A and 73.98±5.19 in group B. (p=0.082). Heart rate was assessed at 40 min, 60 min and 6 hours. A rise in the heart rate post operatively in both the groups at 40 and 60 minutes was observed. But this difference was not statistically significant at 6 hours (p>0.05).

- In this study the mean baseline SBP was 115.46±5.20 mm Hg in group A and 117.13±5.59 in group B. (p =0.093). The mean baseline DBP was 73.95±4.81in group A and 75.61±5.44 (p=0.078) in group B. The mean baseline MBP was 88 ± 4 in Group A 89.45 ± 5 in Group B. A rise in the systolic, diastolic and mean blood pressure above the baseline post operatively in both the groups at 40 and 60 minutes was observed and it was statistically significant. But this difference was not statistically significant (p>0.05) at 6 hours.

Deviation of haemodynamic parameters from the baseline are given in the above tables and figures. In the review of literature, there are different results about the efficacy of various concentrations and volumes of levobupivacaine used for preemptive analgesia. Most studies were done with 0.25% Levobupivacaine like this study. Comparative methods are further mentioned.

HAEMODYNAMIC PARAMETERS:

Haemodynamic parameters were evaluated in very few studies. Cnar SO et al (2009) compared the postoperative analgesic effects of preincisional and postincisional wound infiltration with levobupivacaine and postoperative cortisol and prolactin levels in children following inguinal hernia repair. Ninety-six children aged 2-10 years who were undergoing elective inguinal hernia repair were randomly enrolled in this study. In group A (n = 32), 0.25 ml kg levobupivacaine (5 mg ml) was infiltrated after induction of general anaesthesia. In group B (n = 32), 0.25 ml kg levobupivacaine (5 mg ml) was infiltrated before the end of the surgery. Group C (n = 32) did not receive levobupivacaine infiltration at any time. Mean arterial pressure, heart rate, objective pain score, adverse effects and the number of rescue analgesics were recorded for 24 h. Blood samples were withdrawn following induction of anaesthesia and at 40 min after the end of surgery for measurement of blood cortisol and prolactin levels. The heart rate, postoperative plasma cortisol and prolactin levels were higher in group C than in either group A or group B (P < 0.05). Similar to the present study they also found that Heart rate and MBP was higher in the control group and wound infiltration with levobupivacaine decreased the stress response to postoperative pain.

Tas E et al (2010) studied to evaluate the effects of peritonsillar injection of levobupivacaine with epinephrine in children undergoing adenotonsillectomy. 20 children undergoing elective tonsillectomy with or without adenoidectomy were enrolled in this prospective, randomized, intraindividual trial. After intubation and just prior to incision, 3 ml of 0.25%

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levobupivacaine with epinephrine was injected into one peritonsillar region while 0.9% saline was being used for the contralateral side. Heart rate and mean arterial pressure during and after operation were also observed along with the VAS score. They concluded that preincisional injection of levobupivacaine with epinephrine decreases early postoperative pain and intraoperative blood loss as well.

VAS SCORE:

In this study post operative VAS score at first hour, six hours, twelve hours and twenty-four hours were recorded in both the groups and they were found to be significant.

In a study conducted by So Ra Ahn et al (2013), they investigated postoperative pain relief using wound infiltration with 0.5% bupivacaine in SILS-A (single-incision laparoscopic surgery in appendicectomy) and compared the result with that for conventional SILS-A. The W-SILS-A group showed significantly lower numbers of additional pain killers and lower VNRS scores 1, 6, and 12 hours after surgery than the CSILS- A group. (W=wound infiltration).

Various studies have been conducted comparing preincisional infiltration with intra-peritoneal instillation of local anaesthetics.

In a study conducted by El-labban, et al (2011) which was designed to compare the effect of intraincisional *vs* intraperitoneal infiltration of levobupivacaine 0.25% on post-operative pain in laparoscopic cholecystectomy. Concluded that intraincisional infiltration of levobupivacaine is more effective than intraperitoneal route in controlling post-operative abdominal pain. It decreased the need for rescue analgesia. Comparing the present study, the need for rescue analgesia was similarly diminished.

In a likewise study, Ismail M T et al (2013) studied 106 infertile patients with the diagnosis of polycystic ovary syndrome (PCOS) who were scheduled to undergo diagnostic laparoscopy and laparoscopic ovarian drilling (LOD). Group I comprised patients who received preincisional local infiltration and intraperitoneal instillation levobupivacaine 0.25%. Patients in *group II* received equal volumes of normal saline 0.9% (NS) at the same sites. They found that combination of preincisional local infiltration and intraperitoneal instillation of levobupivacaine 0.25% was found to substantially reduce postoperative pain and the consumption of postoperative analgesics during the first 24 h; and shorten hospital stay and time to resume normal activities after LOD. It was also associated with a very high overall patient satisfaction without any significant adverse events.

Pre Vs Post infiltration

Also supporting this study F. Cantore et al (2008) the aimed to test the effectiveness of local anesthetics comparing pre versus post operative trocar site's infiltration. Their study demonstrated that infiltration of the trocar site with long lasting local anesthetic is extremely effective for the treatment of post operative pain after laparoscopic cholecystectomy; pre incisional local infiltration seems to be better in term of pain perception and intravenous post operative analgesic consumption.

Wound infiltration has been tried with other drugs too and/or compared with levobupivacaine.

Numanog et al (2014) studied to determine both the systemic analgesic and the local anesthetic effects of tramadol and to determine how it differs from bupivacaine when administered preincisionally. They found that between T and B groups, the anesthesia time, perioperative hemodynamic changes, and pain scores were not statistically different. However, in group B, the postoperative analgesic requirement was higher than in group T. Concluded that Tramadol shows equal analgesic effect to bupivacaine and decreases additional analgesic requirement, when used for preincisional infiltration anesthesia in children undergoing inguinal herniorrhaphy.

Alp gurbet et al (2008) determined the efficacy of preemptive wound infiltration with levobupivacaine and levobupivacaine-methyl prednisolone at the surgical site for pain relief. They suggested that preemptive infiltration of the wound site with levobupivacaine alone or combined with methyl prednisolone provides effective pain control with reduced opiate dose after unilateral lumbar discectomy.[15]

CONCLUSION

The present study's results allow us to conclude that addition of preincisional levobupivacaine to general anaesthesia significantly promoted analgesia in patients undergoing abdominal surgeries with a better post operative recovery and decrease in need of Diclofenac injection in the early post operative period.

Preincisional levobupivacaine infiltration is a better adjuvant to general anaesthesia when compared to normal saline infiltration in providing analgesia in the early post operative period, superior intraoperative analgesia, stable perioperative cardio respiratory parameters and in providing patient comfort and decreasing the necessity of post operative analgesics.

Overall, the experience with levobupivacaine was quite satisfactory as compared to the normal saline group. The results of this study clearly indicate the effectiveness of preincisional levobupivacaine infiltration on post operative recovery in patients undergoing general anaesthesia. Levobupivacaine has a definitive edge in providing analgesia in the early post operative period.

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