

Original research article

Efficacy of Ilioinguinal Nerve Block after Lower Segment Caesarean Section on Requirement of Post-operative Analgesia

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Abstract

Background: Pain after abdominal surgeries is an important cause of distress in the perioperative period. The postoperative pain following cesarean sections may vary from mild to moderate intensity and usually lasts for 72 hours. We in the current study tried to compare the duration of pain relief in the postoperative period by bilateral ilioinguinal and iliohypogastric nerve blocks.

Methods: The patients were selected from the following inclusion criteria. Patients scheduled for elective lower cesarean section. Patients of age group between 25-35 yrs (primiparous and multiparous). Patients belonging to ASA I and II grades. They are named as Group A was scheduled to receive bilateral Ilioinguinal nerve block with 20 ml of 0.25% Bupivacaine solution in addition to spinal anesthesia with 2.5 ml of 0.5% Bupivacaine (Hyperbaric). Group B was scheduled to receive only spinal anesthesia with 2.5 ml of 0.5% Bupivacaine (Hyperbaric).

Results: The cutoff values for receiving supplemental analgesia were VAS scores of 3 and above. The average time to the first dose of Tramadol in group A was observed to be 246.1 min as compared to 179.7 mins in group B ($P < 0.001$). The total consumption of Tramadol in 24 hrs postoperatively has been 173.3 mg in group A as compared to 226.7 mg in group B. The total adverse events related to Tramadol observed in group A was 16 as compared to 28 in group B, the incidence of total adverse events related to Tramadol consumption was found to be considerably less in group A as compared to group B (p -value < 0.0005).

Conclusion: There was a significant reduction in postoperative consumption of a total dose of Tramadol in lower segment cesarean sections surgeries can be achieved using bilateral ilioinguinal iliohypogastric nerve block using plain Bupivacaine. Adequate postoperative pain relief provided with the ilioinguinal nerve block significantly lowers the common side effects associated with Tramadol or other Opioid analgesics.

Keywords: Ilioinguinal nerve block, Lower Segment Caesarean Section, postoperative analgesia, Visual Analogue Scale (VAS).

Introduction

Pain forms the inevitable post-operative sequelae of any surgical procedure and relief of post-operative pain forms a major component of post-operative care of these patients. The International Association for the study of Pain (IASP) has defined pain as "An unpleasant sensory and emotional experience associated with actual or potential tissue damage". [1]

Interindividual variability of postoperative pain is influenced by multiple factors including sensitivity to pain, psychological factors, age, and genetics. [2-4] Despite advances in postoperative pain management, post-operative pain relief and satisfaction are still inadequate in some patients because of individual variability and the limitation of side effects of analgesic drugs or techniques. [5] Cesarean delivery patients have even more compelling reasons to achieve optimal postoperative pain relief than other surgical patients, and they also present unique challenges. Post cesarean section patients are known to have a significant degree of pain over the surgical incision site. For postoperative pain relief opioids and NSAIDs have been used. Though systemic opioid administration provides adequate postoperative pain relief, they are known to cause significant side effects such as respiratory depression, nausea, vomiting, pruritis, and urinary retention. [6] which might necessitate close monitoring and intervention whenever necessary. Post-cesarean delivery patients are at a higher risk for thromboembolic events, which may also be precipitated by immobility from inadequate pain control or excessive sedation from opioids. Post-operative pain in parturients has many detrimental effects. These parturient women would want to ambulate, to be alert and energetic enough to care for, interact with, and breastfeed their new-born. With these goals in mind, the analgesic of choice requires a minimal transfer in breast milk, little or no effect on neonates, minimal maternal side effects, and minimal or no interference with caring for the newborn or discharge from the hospital. Regional anesthesia techniques have been proven to provide satisfactory postoperative analgesia free from systemic side effects. [7] Blockade of the ilioinguinal and iliohypogastric nerves significantly decreases opioid analgesic requirements in both children and adults' Regional anesthesia techniques such as transverse abdominis plane block and bilateral ilioinguinal iliohypogastric nerve blocks. [10-13] have been used to provide postoperative pain relief following cesarean sections. This study has been conducted to compare the duration of pain relief in the postoperative period by bilateral ilioinguinal and iliohypogastric nerve block using plain Bupivacaine 10 mg and Bupivacaine 10 mg in combination with Bupivacaine intrathecally among the parturients undergoing Lower Segment Caesarean section.

Material and Methods

This cross-sectional study was conducted in the Department of Anesthesia Government Maternity Hospital and CKM Hospital, Warangal. Institutional Ethical approval was obtained for the study. Written consent was obtained from all the participants of the study after explaining the nature of the study in the local language.

Inclusion Criteria

1. Patients scheduled for elective lower cesarean section.
2. Patients of age group between 25-35 yrs (primiparous and multiparous).
3. Patients belonging to ASA I and II grades.

Exclusion Criteria

1. Those with contraindication to spinal anesthesia.
2. Preeclampsia or eclampsia
3. ASA status III and IV Patients with bleeding diathesis or coagulopathy.
4. Allergy to local anesthetics
5. Local infection at the site of subarachnoid block or Ilioinguinal block, Patients
6. undergoing emergency surgery with Foetal or maternal indications for Immediate
7. delivery.
8. Patient's refusal to participate

Patients were selected after a thorough pre-anesthetic assessment including Pulse rate, Blood pressure, Cardiovascular, Respiratory system, Neurological, and Spine status. Mandatory investigations included Hb%, TLC, DC and ESR, Bleeding time and clotting time, Blood sugar (Fasting and Postprandial), Blood urea and serum creatinine, Complete urine examination, HIV and HBsAg tests, ECG, and other investigations were carried out Pre operatively depending upon the indications and clinical profile of the patients. A total of N=60 cases are randomly divided into two groups each. They are named as Group A was scheduled to receive bilateral Ilioinguinal nerve block with 20 ml of 0.25% Bupivacaine solution in addition to spinal anesthesia with 2.5 ml of 0.5% Bupivacaine (Hyperbaric). Group B was scheduled to receive only spinal anesthesia with 2.5 ml of 0.5% Bupivacaine (Hyperbaric). All patients were kept nil per oral for 8 hrs before surgery. After recording the baseline blood pressure all patients were given a fluid preload with intravenous Ringer lactate solution at the rate of 10-15ml / kg body weight, preceding the block. All patients were intensively monitored during anesthesia and surgery with a common protocol. Continuous three lead electrocardiogram monitoring was done; Blood pressure was monitored every three minutes using an oscillometric noninvasive Blood Pressure monitor. Oxygen saturation was monitored with the help of a Pulse Oximeter. On completion of the surgery, all patients were detained in the post-anesthesia care room for thirty minutes; pain at rest and with effort was recorded and then dispatched to their respective wards. The patients were followed subsequently, and the level of pain was assessed by using the VAS scores (linear 10 mm, starting from 0 = no pain to 10 = worst pain imaginable). It was recorded at rest and with effort; initially at 30 min postoperatively, and then at 2 hrs, 4 hrs, 8 hrs, 12 hrs, 16 hrs, 20 hrs, and 24 hrs respectively. After each VAS scoring interval, patients were inquired whether they require additional analgesia regardless of their VAS score. Patients were also instructed to request pain medication from the nurse whenever they required pain relief and not to wait for their next scheduled pain assessment. Injection Tramadol 50 mg IV as standard rescue analgesia was given. All the available data were analyzed by SPSS version 19 for descriptive statistics.

Results

The patients who participated in this study were in the age group 20- 35 yrs. Most of the parturients were between 29-32 yrs details depicted in table 1. The mean weight of the cases in group A was 65.0 Kgs with a range of 60.5 to 67.5 Kgs and in group B it was 65.06 Kgs with a range of 61.6 to 67.0 Kgs. Based on the ASA category distribution of cases in group A were n=27(90%) belonging to ASA I and n=3(10%) belonging to the ASA II category. Similarly, in group B n=26(86.67%) cases were belonging to ASA I and n=4(13.33%) belonging to the ASA II category.

Table 1: Showing the demographic profile of the cases included in the study

Age group (years)	Group A		Group B		Total	
	(n)	%	(n)	%	(n)	%
20-23	0	0.0	2	6.666	2	3.333
23-26	8	26.665	5	16.665	13	21.666
26-29	10	33.333	9	29.997	19	31.665
29-32	11	36.633	9	29.997	20	33.333
32-35	1	3.333	5	16.665	6	10.00
Total	30	100	30	100	60	100.0

The mean systolic blood pressure in group A in the immediate preoperative period was observed to be 118.20 ± 7.988 mmHg. The mean systolic pressures recorded in the immediate postoperative period was 110.93 ± 7.002 mmHg. In group B the mean systolic blood pressures

preoperatively and immediate post-operatively were 118.00 mmHg and 108.87 mmHg, respectively. There was not a remarkable difference in the mean systolic blood pressures between 4 hrs to 24 hrs in both the groups. The majority of the patients demonstrated a sensory block till T7 and T8 dermatomes, few patients demonstrated an overlap between T6-T7 and T7-T8 shown in table 2.

Table 2: Level of Anaesthesia Achieved

Level of Anesthesia achieved	Group A		Group B	
	(n)	%	(n)	%
T6 – T7	2	6.666	0	0.000
T6	2	6.666	0	0.000
T7	10	3.333	12	40.000
T7 - T8	4	13.333	0	0.000
T8	12	40.000	18	60.000
TOTAL	30	100	30	100

There was no significant difference in heart rate among both the groups postoperatively. The mean heart rates at 4 hrs postoperatively were 87.1/min in group A and 92.2/min in group B respectively. The mean heart rates were observed to be 85.5/min in group A and 92.59/min in group B at 12 hrs postoperatively. The average visual analog score was always found to be lower during 24 hrs postoperatively in group A as compared to group B given in table 3.

Table 3: Average Visual Analogue Score in both groups

Group A					Group B					P values
Post operative Period (hours)	Mean VAS Score	SD	Max	Min	Post operative Period (hours)	Mean VAS Score	SD	Max	Min	
2	1.233	0.60	1.30	1.16	2	2.06	0.82	2.12	2.01	0.012*
4	2.633	0.49	2.66	2.60	4	2.60	0.81	2.65	2.54	0.236
8	2.333	0.80	2.38	2.27	8	2.53	0.68	2.57	2.48	0.102
12	2.567	0.67	2.61	2.52	12	2.73	0.63	2.77	2.69	0.881
16	2.433	0.67	2.47	2.38	16	2.63	0.49	2.66	2.60	0.361
20	2.533	0.68	2.57	2.48	20	2.63	0.49	2.66	2.60	0.143
24	2.600	0.49	2.63	2.56	24	2.86	0.34	2.89	2.84	0.520

* significant

The cutoff values for receiving supplemental analgesia were VAS scores of 3 and above. The average time to the first dose of Tramadol in group A was observed to be 246.1 min as compared to 179.7 mins in group B and this difference is statistically significant ($P < 0.001$). The total consumption of Tramadol in 24 hrs postoperatively has been 173.3 mg in group A as compared to 226.7 mg in group B and this difference is statistically significant depicted in table 4.

Table 4: Comparison of the average time to the first dose of Tramadol in both groups

	Group A		Group B		P values
	Mean	± SD	Mean	± SD	
<i>Average time to first dose of Tramadol in minutes</i>	246.1	45.47	179.7	44.58	0.001*
<i>The average total dose of Tramadol in mg in 24 hours</i>	173.3	28.56	226.7	25.37	0.001*

* significant

The average time interval between delivery of spinal block and the start of surgery was almost similar in both the groups and was observed to be 10 mins in group A as compared to 07 min in group B. The duration of surgery i.e., from the start of surgery to completion of the surgery was almost similar in both the groups. The total adverse events related to Tramadol observed in group A was 16 as compared to 28 in group B, the incidence of total adverse events related to Tramadol consumption was found to be considerably less in group A as compared to group B and was statistically significant (p-value < 0.0005).

Discussion

Laparotomy performed through a Pfannenstiel incision is one of the most common a procedure involving the female abdomen. [14] It is a major surgical procedure, substantial postoperative discomfort and pain are always anticipated. [15] Provision of effective postoperative analgesia is of key importance in this subgroup of patients to facilitate early ambulation, infant care, and prevention of postoperative morbidity. [16] Lower segment caesarean section performed by Pfannenstiel incision lies at L1-L2 dermatomes. Sensory innervation of L1-L2 dermatomes is accomplished by ilioinguinal and iliohypogastric nerves. In the current study, both Group A and Group B patients received spinal anesthesia for the surgery. The mean VAS scores as depicted in table 3 shows mean VAS scores were significantly lower in group A as compared to group B and the p values at the interval of 2 hours postoperative were found to be significant. There was a significantly different time to the first dose of Tramadol and total dose of tramadol in group A patients as compared to group B. The incidence of Tramadol-related adverse events was also found to be significantly lower in group A. In a similar study Huang SJ et al., [17] found in n=60 females with lower abdominal surgery under epidural anesthesia. With the administration of a subcutaneous infiltration with 30 ml of 0.125% bupivacaine (with 1/200,000 epinephrine) over the proposed surgical area five minutes before the surgical incision. They observed lower pain scores after 28 hours including cough-associated pain scores. F H Anderson et al., [18] studying the effect of local infiltration anesthesia with or without additional ilioinguinal blockade found in patients undergoing inguinal hernia mesh repair found a significant reduction in the intraoperative VAS score in the group receiving additional ilioinguinal nerve block, as compared to the group receiving saline placebo, no difference in pain scores or analgesic requirements were observed at 24 and 48 h postoperatively. This shows that there is added beneficial effect on pain control by ilioinguinal nerve block in lower abdominal procedures. F Oriola et al., [19] compared the effect of bilateral Ilioinguinal nerve block with a combination of ropivacaine and clonidine versus Ilioinguinal nerve block performed using saline in seventy female patients undergoing non-laparoscopic surgeries under Pfannenstiel incision. assessed and compared pain scores using VAS up to 48 hrs after the end of the surgery, whereas we designed to assess the pain scores using VAS till 24 hrs only. Morphine was the chosen analgesic with a target to keep the $VAS \leq 3$ in their study while we used Tramadol. A 51% decrease of cumulative morphine consumption was observed during the first 48 postoperative hours after surgery when bilateral Ilioinguinal nerve block was performed with ropivacaine plus clonidine compared with the control group. Kuppervelumani P et al., [11] in their study performed an abdominal field block at T10-L1 using a cocktail of

0.5% of bupivacaine with adrenaline and xylocaine 1%, bilaterally in 30 patients undergoing cesarean section under general anesthesia providing effective postoperative analgesia. Their study showed a significant reduction in narcotic requirement (mean 66.6 mg of pethidine) compared to the control group (mean 163 mg of pethidine), thereby producing analgesia for the duration ranging from 8 to 12 hours. The findings of their study substantiate our hypothesis and are also commensurate with our findings of a decrease in the total dose of Tramadol consumption and prolongation of analgesia postoperatively.

Conclusion

The present study found that Bilateral ilioinguinal iliohypogastric nerve block using plain Bupivacaine, in combination with intrathecal Bupivacaine results in low pain scores following lower segment cesarean section surgeries. There was a significant reduction in postoperative consumption of a total dose of Tramadol in lower segment cesarean sections surgeries can be achieved using bilateral ilioinguinal iliohypogastric nerve block using plain Bupivacaine. Adequate postoperative pain relief provided with the ilioinguinal nerve block significantly lowers the common side effects associated with Tramadol or other Opioid analgesics.

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