Research Paper MEDICAL SCIENCE

Bilateral Ilioinguinal Nerve Block for Post-Operative Pain Relief And Maternal Behavioral Response Following Lower Segment Caesarean Section Under General Anaesthesia - Clinical Trial

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ABSTRACT

We studied the effect of bilateral ilioinguinal nerve block on postoperative analgesia in 30 patients following lower segment caesarean section by pfannensteil incision under General anesthesia. Pain relief was assessed objectively by PR and MAP and subjectively by VAS, PPI and coin scale at ½, 1, 1 ½, 2, 4,6,12, and 24 hrs following the block. The mean PR and MAP were significantly lower at all times and the difference among them in different intervals was statistically significant. All the three pain scales showed lower scores between 1 and 12 hrs. The mean time of initiation of breastfeeding was 204.64±13.82 and the mean time of first order for analgesia was 343.28±15.87.Conclusion-bilateral ilioinguinal nerve block administered using Bupivacaine provides effective analgesia and the mothers are able to breast feed earlier and have a more satisfying interaction with their newborn.

KEYWORDS Ilioinguinal Nerve Block, Postoperative Pain, LSCS, Pfannensteil incision

INTRODUCTION

Postoperative pain is acute physiological pain which if unrelieved can lead to harmful physiological and psychological effects[1]. Pain following LSCS is distinct in that the patient has added responsibility of nursing and looking after her newborn. Presence of acute pain imposes limitation on her ability to interact with newborn. Therein lies emphasis of providing effective postoperative analgesia that allows mother to be pain free and awake.

Nerve blocks proven to effective in providing the postoperative analgaesia.[2]The systemic side effects are comparatively less in nerve blocks. Bilateral blockade of ilioinguinal and iliohypogastric nerves at the level of anterior superior iliac spine produces analgesia covering the dermatome supplied by first lumbar nerve in its distal distribution.[3]The pfannensteil incision lies within this dermatome. It is therefore possible to provide analgesia of anterior abdominal wall following this incision using the above technique.

Therefore we studied the effectiveness of bilateral ilioinguinal nerve block for post operative analgesia following LSCS performed by a pfannensteil incision.

AIM AND OBJECTIVES

1. To evaluate the effectiveness of ilioinguinal nerve block by VAS, PPI and coin scale.
2. To assess the interaction of mother with the baby by Noting the time of initiation of breast feeding
3. To assess the mean time for the first request for analgesia.

MATERIALS AND METHODS

STUDY POPULATION

After ethical committee approval, and informed consent for the procedure, 30 patients undergoing LSCS by pfannensteil incision under GA were included in the study.

INCLUSION CRITERIA-ASA grades I and II, Age between 18-30 yrs, Primigravidae and/or multigravidae undergoing their first caesarean section.

EXCLUSION CRITERIA-Infection at site of injection, Allergy to local anesthetics\NSAIDS, Patients who have undergone previous surgery requiring mid line incision, Patients with any obstetric/medical complications.

PROCEDURE-A thorough pre-anesthetic evaluation was done with special emphasis on cardio respiratory, nervous system and endocrinal abnormalities. Previous anesthetic exposure and drug sensitivity were enquired. Height and weights were recorded. Written informed consents were taken. Investigations done were Hb%, BT, CT, RBS, Blood Urea, Serum Creatinine, Urine Analysis for albumin, sugar & microscopy, ECG-in 12 leads, Lignocaine test dose. Patients were advised to be nil orally from 10 p.m. onwards and were pre-medicated with tab. diazepam 0.2 mg/kg, tab ranitidine 150mg, tab metoclopramide 10mg on the previous night of surgery and on morning of surgery. Baseline heart rate, systolic blood pressure and diastolic blood pressure were measured in supine position using a mercury sphygmomanometer. Mean arterial blood pressure was derived from the formula, MAP = DBP + PP/3. Following preoxygenation for 3 mins Rapid sequence technique done with Inj. Thiopentone 4mg/kg and suxamethonium 1.5 mg/kg.Cricoid pressure applied and intubated.Neuromuskular blockade maintained with vecuronium 0.1mg/kg. Maintenance with 50:50 N_2O: Oxygen + 0.5% Halothane. At delivery all patients received oxytocin 10 units and fentanyl 100mcg. A BILATERAL ILIOINGUINAL NERVE BLOCK using 22G spinal needle was administered prior to reversal of NM blockade. The technique followed was as described by Bahr V.V.[4] –from a point 2 finger breath medial to anterior superior iliac spine, a needle was introduced vertically to infiltrate the muscles in front of the pelvic bone with 5ml of 0.25% Bupivacaine .From the same point of injection needle was advanced vertically to penetrate aponeurosis of external oblique muscle .A further 5 ml of the drug was injected under the aponeurosis of external oblique muscle ,part of the drug was injected caudal to site of injection and the rest in mediocaudal direction. Supplemental analgesia was provided by inj. Diclofenac 75 mg i.m.on demand by the patient.

Pain relief was assessed by both objective and subjective parameters for 24 hrs following the block at ½,1,1 ½,2,4,6,12, and 24 hrs.Pulse rate and mean arterial pressure constituted

the objective parameters whereas Visual Analogue Scale(VAS), Present Pain Intensity(PPI)and coin scale constituted subjective parameters.

Visual analogue scale – is a vertical or horizontal line, 10cm length with descriptive words such as "no pain" and "worst pain" written at end points.

Present pain intensity, 0– No pain, 1 – Mild pain, 2 – Discomforting, 3 – Disturbing 4 –Horrible, 5 – Excruciating

Coin scale –100 paisa - worst pain, 0 paisa "no pain". Especially for illiterates.

The time of initiation of breastfeeding and first request for analgesia were noted.

Statistical Methods- The agreement between the subjective parameters are determined by Kendall coefficient of concordance. The pulse rate and the mean arterial pressure at various intervals are compared to the baseline by Wilcoxon signed rank test and Student "t" (paired) test respectively. The results of objective and subjective parameters are compared by scatter plots.

OBSERVATIONS AND RESULTS :-

The mean age (in years) was 23.5±2.37 and the mean weight (in kgs) was 53.65±5.09.Table 1 shows VAS,PPI,coin scale values at various intervals. All the three scales showed lower scores between 1 and 12 hrs.The relationship of three types of pain scores computed by Kendall Coefficient of Concordance showed that all three methods are similar in rating the pain. Figure1 shows Chi square values were computed from the Kendall Coefficient of Agreement between the three pain scoring methods. The values more than 10 are highly significant in terms of relationship of three methods. The bar diagram shows a highly significant relationship among three scales.

Table1-Relationship of three types of pain scores and Pain scores at various intervals.

	Average				χ^2	
	VA	PPI	COI			
0 hour	3	2	40	0.36	27.	p<0.05
0.5	3	2	30	0.38	27.	p<0.05
1.0	2	2	20	0.25	17.	p<0.05
1.5	2	2	20	0.32	22.	p<0.05
2.0	2	2	20	0.34	24.	p<0.05
6.0	2	2	20	0.45	33.	p<0.05
8.0	2	2	20	0.31	23.	p<0.05
10.0	2	2	20	0.44	31.	p<0.05
12.0	2	2	20	0.36	26.	p<0.05
24.0	3	2	25	0.45	34.	p<0.05

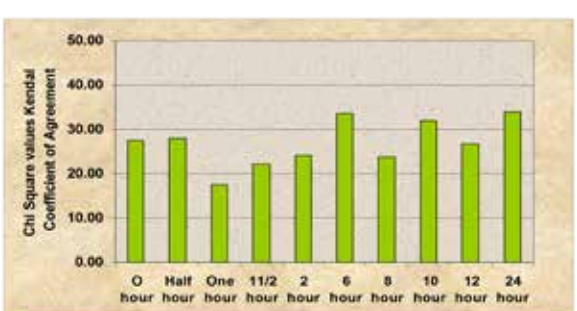


Figure1- Relationship of three types of pain scores

Table2 shows Mean pulse rate computed for 24 hrs intervals ½, 1, 1 ½, 2, 4,6,12, and 24 hrs. Effect size computed from baseline PR indicates the linear fall in PR till 6 hrs then diminishes till 6-12hrs and then reach a steady state (Figure 2&3). The mean fall in pulse rate at each interval is significant.

Table 2: Variations in the pulse rate

Time Interval (hrs)	Min.	Max.	Mean	SD	Significance *
Baselin	80	110	102.5	8.32	-
0.5	84	108	96.93	6.68	p<0.05
1.0	78	100	93.00	5.35	p<0.05
1.5	72	98	89.85	5.44	p<0.05
2.0	72	98	88.09	5.97	p<0.05
6.0	72	98	86.29	5.52	p<0.05
8.0	72	96	85.71	5.24	p<0.05
10.0	70	94	83.93	7.00	p<0.05
12.0	70	94	82.14	5.99	p<0.05
24.0 hour	70	94	82.14	6.27	p<0.05

(Significance test: Wilcoxon Signed rank test between the baseline & other time interval)

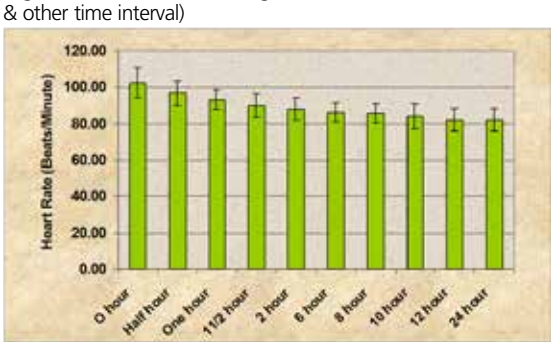


Figure2-Variations of Pulse rate

Figure3-Variations of Pulse rate

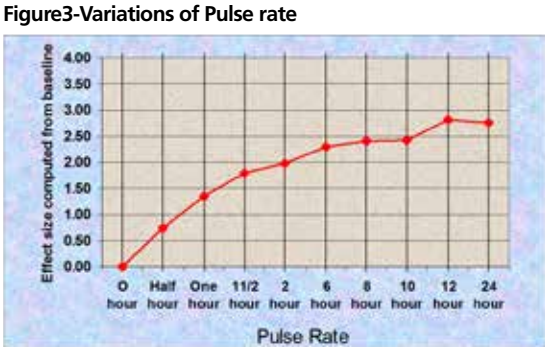


Table 3 shows the variations in MAP at various intervals. There is a significant fall in MAP at each interval. The effect size computed from baseline MAP showed the linear fall in MAP for 1st 2 hrs then diminishes for next 2-10 hrs, and then reaches a steady state (Figure 4 &5). The relationship of the subjective and objective parameters computed on the scatter plots (Figure6&7) shows that the subjective and the objective parameters are positively related

Table 3: Variations of MAP

Time Interval	Min.	Max.	Mean	SD	Significance *
Baseline	74	110	97.32	8.42	-
0.5	84	108	96.40	6.50	p>0.05
1.0	72	106	89.89	7.25	p<0.05
1.5	72	100	86.96	6.76	p<0.05
2.0	72	98	84.71	5.94	p<0.05
6.0	72	98	84.54	5.99	p<0.05
8.0	72	98	82.18	6.46	p<0.05
10.0	72	94	80.50	6.04	p<0.05
12.0	72	94	80.57	5.43	p<0.05
24.0 hour	72	94	80.46	5.67	p<0.05

Figure4-Variations of MAP

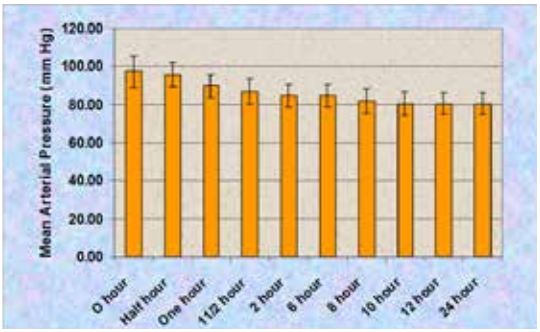


Figure5-Variations of MAP

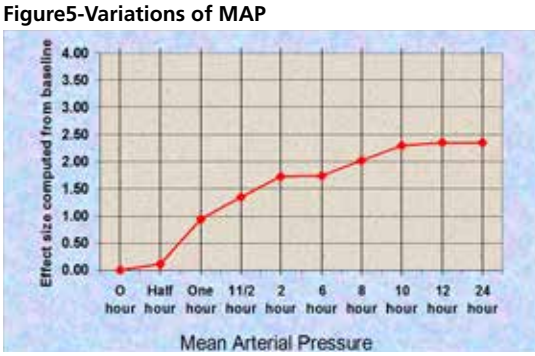


Figure 6-Relationship of subjective and objective parameters (Blue line-PR,Redline-MAP)

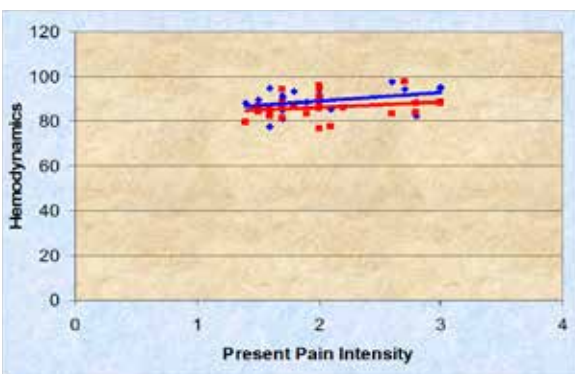


Figure7- Relationship of subjective and objective parameters(Blue line-PR,Redline-MAP)

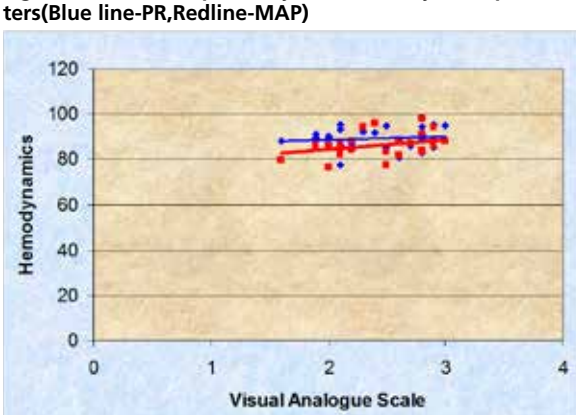


Table 4 shows other parameters studied during the study.The mean time of initiation of breastfeeding was 204.64±13.82 and the mean time of first order for was 343.28±15.87.

Table 4 : Other parameters studied

Other parameters	Minimum	Maximum	Mean	SD
Incision Delivery Time	5	12	7.14	2.43
Duration of Surgery	35	70	50.12	10.41
Initiation of Breast feeding	180	445	204.64	13.82
First Order of Demand Analgesia	315	310	343.28	15.87

DISCUSSION

Our study results indicated that all patients had a superior degree of pain relief as indicated by lower VAS, PPI, coin scale especially between 1-10 hrs. Another indicator is the mean time of first request for analgesia was 343.28±15.87 mins indicating the mean duration of bilateral ilioinguinal nerve block.

Bunting and Mc Conachie[3] observed lower pain scores at all times during their study in patients receiving ilioinguinal nerve blocks.

Gunta and colleagues [5] compared the effectiveness of bilateral ilioinguinal nerve block and wound infiltration for postoperative analgesia following caesarean section. They observed the lower pain scores at all times for first 24 hrs and significantly lower pain scores at 4, 8, 12, 20 hrs and this matches with our present study.

In our study the VAS, PPI, coin scale are similar in rating pain. Chapman and colleages[6] have shown that rating scores are prone to response biases and therefore PPI scores are not as sensitive as other scores I measuring pain intensity.

The hemodynamic parameters also indicated a superior degree of pain relief. There is linear fall in PR till 6 hrs then diminishes till 6-12hrs and then reach a steady state. The mean fall in pulse rate at each interval is significant. There is a significant fall in MAP at each interval. There is linear fall in MAP for 1st 2 hrs then diminishes for next 2-10 hrs,then reaches a steady state. The relationship of the subjective and objective parameters shows that the subjective and the objective parameters are positively related

Cousins[1] in is review on Acute and chronic postoperative pain stated that acute pain changes an individual behavior which is manifested by withdrawal from interpersonal contact and increased self absorption and concern. Sinatra[7] in his review on postoperative analgaesia following caesarean section clearly indicate that poorly controlled pain interferes with ambulation,breast feeding and early maternal bonding after caesarean section.A good and reliable index of behavioral response in post caesarean patients is ability of the mother to breast feed and nurse her newborn.In our study the mean time of starting breast feeding is 204.64 which is <4hrs.which helps in better ambulation,initiating breast feding early and helps in maternal bonding.

Conclusion

The patients receiving the ilioinguinal block with bupivacaine were more comfortable and satisfied with the pain relief. The haemodynamic parameters also confirmed the degree of pain relief, coinciding well with associated subjective scores. We conclude that, bilateral ilioinguinal nerve block administered using bupivacaine provides effective analgesia. This technique has a significant opioid sparing effect and allows early and satisfactory interaction of the mother with the baby. During immediate postoperative period it avoids the need of narcotic and/or NSAIDs which have their own side effects

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