ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 05 | May - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISION OF USG GUIDED POST LSCS ILLIOINGUNAL & ILLIOHYPOGESTRIC NERVE BLOCK AND INFILTRATION FOR ANALGESIA AFTER CESAREAN SECTION -A PROSPECTIVE RANDOMIZED CLINICAL STUDY

Anaesthesiology

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ABSTRACT

Background and Aims: Caesarean delivery is a major surgical procedure that can result in significant postoperative pain and discomfort, ranging from moderate to severe An effective substitute for postoperative pain management is epidural analgesia. However, the gravid uterus raises the risk of vascular and dural puncture and makes it more challenging to locate the space. Additionally, it might not be preferred in cases of urgent caesarean delivery. Although local anesthetic infiltration is used to treat pain, it is ineffective for long-term analgesia for these patients, parenteral analgesia combined with abdominal field block is currently a common multimodal analgesic method. To avoid the complications that are more frequent with the blind approach, we adopted the USG-guided procedure. Additionally, it provides a real-time image of the needle tip and any pertinent anatomical structures, enhancing safety and decreasing the likelihood of failure. The primary aim of this study was to to assess analgesic efficacy of ultrasonography guided bilateral illionguinal- iliohypogastric Nerve block for post operative pain after caesarean section by comparing pain score –visual analogue score and Total analgesic consumption of illionguinal- iliohypogastric block group with that of control group. **Methods:** It was a prospective, randomized clinical study. 120 patients of 18-40 years age group, of female gender Patients with singleton, full term pregnancyPatients with ASA Physical status – I,II and III Patients were scheduled for elective and emergency LSCS under spinal anaesthesia undergo elective or emergency LSCS surgery in SSGH, Vadodara were included. They were randomly divided into 2 groups (B & C) using sealed envelope method. Parameters observed were VAS score ,duration of analgesia ,Time to First rescue analgesia,cumulative requirement of analgesia within 24 hour,post block vital parameter like pulse rate,BP,spo2 and complications. **Results:** Time to first rescue analgesia and duration of analgesia prolonged in group B(13.11±0.96 hr) compare to group C (6.95 ± 0.72 hr)and VAS score and cumulative requirement of analgesia is less in group B (1.43±0.64 gm) compare to group C (1.91±0.68 gm), P value being <0.01. Rest of the parameters were comparable in both the groups. **Conclusion:** USG guided ILIH nerve block is better method for providing longer post operative analgesia than infiltration in post LSCS method.

KEYWORDS

USG machine, ILIH Block, recquirment of rescue anlgesia

1. INTRODUCTION

Pain is perhaps the most feared symptoms of disease and trauma. “PAIN IS AGONY WHILE ITS RELIEF IS ECTASY”. International association for study of pain (1979) defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or describe in terms of such damage. 1.Direct trauma to operated tissues.2.Reflex muscle spasm and visceral distention. 3.Patien's anxiety and previous painful experience. Post-operative pain, on the other hand, is transient and self-limiting, peaking during the first postoperative day and diminishing over the following 24 hours.[1] As a result, it is more susceptible to therapy than chronic pain. The two primary components of caesarean section pain are somatic (caused by the abdominal wall incision) and visceral (from the uterus). Patients' pain is significantly influenced by their abdominal wall incisions. The Somatic pain generated at the incision site is conducted by the Ilioinginal and Iliohypogastricnerves (IL-IH). which innervates the L1-2 dermatome distribution. [2]In contrast to the somatic component of post-operative pain the visceral pain component is diffuse with no peripheral nerve association. Accurate needle positioning is provided by the ultrasound-guided (USG) nerve block. This lessens the possibility of drug toxicity, block failure, and the need for a high volume compared to the traditional technique.[3]

2. METHODOLOGY

After taking permission from *Scientific and Ethical Research Committee* of Government Medical college and SSG Hospital, Vadodara, a single blinded randomized controlled trial was carried out. Total 120 adult, ASA I , II,andIII patients of female patient between ages18 -40 years who were admitted and scheduled for elective or emergency under spinal anaesthesia were selected.

Exclusion Criteria:

Patient with Patients refusal and not able to understand study protocol.Patients who are hypersensitivity to local anaesthetic drug,Contraindication to spinal anaesthesia,Severe PIH,Patients with compromised renal and liver function, uncontrolled diabetes, uncontrolled hypertension, severe cardiovascular and respiratory disease.Infection, trauma, scar or sinuses at site of illionguinal-iliohypogastric block.

Sample Size Was Estimated As Follows:

By keeping two sided :α error = 0.01,β error= 0.05,power= 05%.Group B of my reference study analgesic effect duration was 8.594(hour) ±SD 1.38(hour) while in group C of my reference study(**SupriyaKrishnegowda, Journal of Obstetric Anaesthesia and Critical Care | Volume 10 | Issue 1 | January-June 2020**) analgesic effect duration was 4.68 (hour) ± SD 0.65 (hour) so mean difference was 3.913 hour

Standardize effect size=mean difference/minimal SD.

Standardize effect size=0.78.

Taking this difference in to consideration and no loss of follow up. The sample size was 60 patients in each group.

On a visit before one day, a full airway assessment was performed as part of the pre-anesthetic checkup, and all patients underwent standard laboratory tests.

The procedure was described to every patient, and their written informed consent was obtained.Standard protocol for Nil per Oral guideline was followed. After bringing the patient inside operation theatre, intravenous line was secured, monitor was attached, and baseline vital parameters were recorded. All patients were premedicated with Inj. Glycopyrrolate 5mcg/kg, Inj. Ondestron. 0.08mg/kg and Inj. Renitidine 0.5-1 mg/kg IV before induction.

Grouping Of Patients:

The study population was randomly allocated to two groups using the opaque *sealed envoleped method.*

1) **Group B (nerve block group)**Spinal anesthesia followed by

postoperative illionguinal&iliohypogastric nerve block with 10ml of 0.5% Ropivacine on each side

2) **Group C (local infiltration group)** Spinal anesthesia followed by postoperative infiltration of the incision site with 20 ml of 0.5% Ropivacine.

Under all aseptic and antiseptic precaution all patients were given spinal anaesthesia with 2 ml of 0.5% heavy Bupivacaine with 23G spinal needle in left lateral position. At the end of surgery all patients were shifted to USG room if patient is hemodynamically All resuscitation equipments. Multipara monitor, sterile gloves, sterile 20GQuincke spinal needle, 10ml syringe, lumbar puncture tray, local anesthetic (20ml Inj.Ropivacine 05%) and Ultrasonography machine with linear probe was keep ready. Patient monitoring (ECG, Pulse oximeter,BP). **Ultrasound guided technique for group B patients Performed by:**Illionguinal&Iliohypogastricblock was performed by my self under guidance of consultant Anesthesiologist with the presence of female assistant.The patient was in supine position with arm on the sides**.** A broadband linear array ultrasound probe (6 to13 Hz frequencies) was used, with an imaging depth of 4-6 cm. with use of jelly.20G quincke sterile spinal needle.Under all aseptic and antiseptic precaution, the ultrasound probe wasplaced on the anterior superior iliac spin (ASIS) perpendicular to illioinguinal, illiohypogastric nerve course.The probe is aligned, rotated and tilted to optimize the image.Iliac crest is identified.Both nerves are located within 1.5 cm from iliac crest in the plane between internal oblique and transverse abdominis muscle.The deep circumflex iliac artery can be revealed with colour Doppler close proximity to these nerves.Then 20G gauge 3.5 inch needle is inserted with in-plane technique. Needle tip and shaft is visualized in the plane close to nerve and local anesthetic solution is deposited after negative aspiration.Hydro dissection with saline can be done to confirm needle tip position and drug spread. The block was achieved in 20-30 minAll baseline parameters was observed and recorded which consist of non-invasive blood pressure (NIBP), electrocardiography (ECG), heart rate, Spo2 before illionguinal & iliohypogastricblock.

After giving USG guided ILIH block in group B and Infiltration in group C patient. Following parameters were studied:

1. Time to first analgesic when VAS score>4. VAS score monitior at 2,4,6,8,12,18 and 24 hour.
2. Duration of analgesia: Time interval from end of the procedure in USG guided illionguinal&iliohypogastric block up to requirement of first rescue analgesic dose post-operatively.
3. Patients was given inj. Paracetamol 1 gm IV as rescue analgesia when VAS> 4.
4. The cumulative requirement of analgesic over first 24hour.
5. *Vital parameters:*pulse, systolic blood pressure,diastolic blood pressure. SpO_2 were noted at baseline(USG room), during procedure, at 15min,30 min,60 min, 2hr,4hr(shifted to recovery room),6hr. 8hr. 12hr. 18hr,24hr after giving ILIH block.
6. *Complications***:** like Bradycardia (HR<50/min) was treated with inj. Atropine 0.6mg I.V.Hypotension (Systolic BP ≥20% of baseline BP) was treated with I.V. fluids and Inj. Ephedrine 5mg i.v. (if required),Tachycardia (HR>100/min) was treated according to cause.,Local anaesthetic toxicity was treated according to severity.Accidental intra peritoneal and intra vascular injection.

Mean and Standard deviation values were taken out. Statistical analysis of the data for the various parameters was done using student's 't' test for all continuous variables and chi-square test was used for qualitative (nonparametric) data using MedCalc software. P value was used to determine the significance of a statistical study.Thep value < 0.05 was considered as significant and p value <0.01 was considered as highly significant.

3. RESULTS

All 120 patients included in the study were analysed. The demographic - age, sex, height, weight, ASA - parameters were comparable between both the groups[Table 1]. Table 2 shows The mean VAS score in both groups was 0 at 2 and 4 hour. It was statistically insignificant. Subsequently, in group B, VAS score was < 4 at 2,4,6,8 hours after ILIH block. No rescue analgesia required. In group C, VAS score > 4 at 8,12,18,24Moreover, at all time intervals except the 2nd and 4th and 6th hour, VAS score was significantly higher in group C as compared to group B. [Table 3]. Time to First rescue analgesia post ILIH block (in 24 hour) (mean ±SD) Time for first rescue analgesic dose was significantly prolonged in group B than group C. It was 13.11±0.96 hr in group B` and 6.95 ± 0.72hr in group c. (p < 0.001).[Table.4] Number of doses of rescue analgesia in 24 hours. In group B, 35 patients required only 1 dose of analgesic, 15 patients required 2 doses, 5 patients's required 3 doses of rescue analgesia. In group C, 15 patients required 1 dose of analgesic, 35 patients required 2 doses, and 10 patients required 3 doses of rescue analgesia. Thus in group B, most of the patients required 1 to 2 doses of analgesic in 24 hours post operative period whereas in group C, most of the patients required 2 doses of rescue analgesia.[Table.5] Cumulative Injparacetamol Requirement after 24 hour (in mg) (mean + SD) Inj.paracetamol. 1 gmIV was given as rescue analgesia when VAS > 4 or patients demand during 24 hours of post block period. In our study total consumption of paracetamol was 1.43±0.64gm in group B whereas it was 1.91±0.68 gm in group C which is highly significant (p< 0.001).there is no statistical difference between two group while comparing vital parameter.

Table 1: Demographic data

Parameter	Group B	Group c	Intra Group P value	Inter Group P value
Number of patients	60	60	>0.05	>0.05
Age(years) (Mean±SD)	26.71±3.11	25.93±2.69	>0.05	>0.05
Weight (Kg) (Mean±SD)	61.33±5.65	61.55±5.55	>0.05	>0.05
Height(cm) (Mean±SD)	155.38±3.48	155.31±3.41	>0.05	>0.05
ASA I	28(46.66%)	30(50%)	>0.05	>0.05
ASA II	21(35%)	20(33.33%)	>0.05	>0.05
ASA III	11(18.33%)	10(16.66%)	>0.05	>0.05

Table 2:mean postoperative visual analogue score (VAS Score)

Mean post operative visual analogue score (VAS)					P-value
	Group B		Group C		
	Mean	SD	Mean	SD	
At 2 Hour	0.0	0.0	0.0	-	-
At 4 Hour	0.0	0.0	2.0	0.0	-
At 6 Hour	0.0	0.0	3.21	0.52	-
At 8 Hour	2.06	0.25	4.08	0.27	<0.001 (HS)
At 12 Hour	3.10	0.39	4.06	0.25	<0.01(S)
At 18 Hour	4.03	0.31	5.20	0.34	<0.01(S)
At 24 Hour	4.11	0.32	6.30	0.37	<0.001(HS)

HS-Highly Significant
S-Significant

Table 3:Time to first rescue analgesia post ILIH block in 24 hour (mean ±SD)

Group B	Group C	p-value
13.11 ±0.96	6.95 ± 0.72	<0.001 (HS)

HS-Highly Significant

Table 4: Number of doses of rescue analgesia in 24 hours

No. of doses	Group B (Number of patients)	Group C (Number of patients)	Intergroup P value
1	35	15	<0.001 (HS)
2	20	25	<0.001 (HS)
3	5	20	<0.001 (HS)

HS-Highly Significant

Table 5 – Cumulative Injparacetamol Requirement after 24 hour (in mg) (mean + SD)

Group B	Group C	P- value
1.43± 0.64	1.91± 0.68	<0.001 (HS)

HS-Highly Significant

4. DISCUSSION

Among procedures on the lower abdomen performed on young ladies, LSCS is one of the most popular. In order to effectively care for the baby, the mother must experience sufficient pain relief. Pfannenstiel incision, located on the L1-L2 dermatomes, is used to execute LSCS. The ilioinguinal and iliohypogastric nerves provide sensory innervations to the L1-L2 dermatomes. In LSCS, the blockage of these neurons provides relief from somatic pain. The simplicity and safety of the ultrasound guided ILIH nerve block make it a desirable technique.

Peripheral nerve blocks with local anesthetics are an important part of regional anesthesia for pain relief. Ilioinguinal -iliohypogastric nerve (ILIH) block has been gaining importance in lower abdominal surgeries. This method has been used successfully for pain relief following lower segment cesarean sections (LSCS)[4]

In our study, we compare post LSCS ILIH block and Infiltration for post operative analgesia.Other parameters like,mean postoperative visual analogue score,First rescue analgesia,number of dose given in each group for analgesia,cumulative dose requirement within 24 hour , Vital parameters and complications were also observed.We concluded that The mean VAS score in both groups was 0 at 2 and 4 hour. It was statistically insignificant. Subsequently, in group B, VAS score was < 4 at 2,4,6,8 hours after ILIH block. No rescue analgesia required. In group C, VAS score > 4 at 8,12,18,24Moreover, at all time intervals except the 2nd and 4th and 6th hour, VAS score was significantly higher in group C as compared to group B. Our results are in consonance with **Sakalli .et al (2009)**who evaluated the efficacy of Ilioinguinal-Iliohypogastric nerve block, if given post-operatively in 64 term parturients during first 24 hours post operatively. They divided two groups of 32 parturients each and in groups I bilateral block was performed with Inj.Ropivacaine 0.5% 10 ml on each side and another group (group II) was given placebo block. In his study he found that patients with ILIH block had significantly low VAS score post operatively within 24 hour.[5] **Wolfson A. et al (2012)** studied to infer whether bilateral multi-injection ilioinguinal –iliohypogastric nerve block along with intrathecal morphine decreases post-operative analgesic prerequisites and adverse effects, therefore results were improved with maternal gratification .They randomized 34 patients undergoing elective cesarean section to receive ILIH nerve block bilaterally with either Inj.Bupivacaine 0.5% 24 ml total (12ml on each side) in one groups (Group Bupivacaine) or Inj.Normal saline in another group(Placebo group) following cesarean section via pfannenstiel incision with intrathecal 12 mg of Inj.Bupivacaine 0.75% with 10mcg of Inj.Fentanyl and 200 mcg of Inj.Morphine (preservatives free) They assessed patients at 0,6,12,18 and 24 hours postoperatively .They recorded VAS score at rest during 24 hours at each time periods. VAS score was decreased in ILIH group at rest and on movement at all time intervals for 24 h of operation in the treatment group.[6]

In group B, patients required first rescue analgesia dose at 13.11 ±0.96 hr after ILIH block and in group C, patients required first rescue analgesia dose at 6.95 ± 0.72 hr. So, there was highly significant difference and prolonged duration of analgesia in group B compared to group C. **Vallejo M.C.et al(2012)** evaluated analgesic efficacy of the bilateral Ilioinguinal-Iliohypogastric nerve block using ultrasound for post-operatively analgesia in parturient undergoing cesarean delivery under spinal anesthesia with intrathecal morphine. The need for postoperative opioids and rescue analgesia was also significantly lower in the ILIH group ($P < 0.001$).[7] **Karim et al 2020** observed 100 children in pediatric age group posted for herniotomy surgeries. Bupivacaine 0.25% givenipsilateral with ILIH block in case group and infiltration in control group. The need for postoperative opioids for rescue analgesia was significantly lower in the ILIH group ($P < 0.001$).[8]

Inj. paracetamol. 1gmIV was given as rescue analgesia when VAS > 4 or patients demand during 24 hours of post block period. In our study total consumption of paracetamol 1.43±0.64 gm in group B whereas it was 1.91±0.68 gm in group C which is highly significant (p< 0.001). **YuluJin et al 2019** observed post operative analgesia for cesarean section in two group TAP (Transverse abdomini plane block) and ILIH block under ultrasound guidance. Cumulative morphine consumption at 6 and 12 h was similar between the two groups (all P>0.05). However, it was significantly lower in the ILIH group at 24 and 48 h (P<0.001).[9]

We carried out the trial under USG guidance, and the transeversus abdominis plane has less vascularity, thus we did not detect any major side effects such unintentional intraperitoneal and intravascular injection.

Limitations of our study include that Local anesthesia can be deposited in the right plane with the help of ultrasonographic imaging. But, due to the 2D ultrasound's limitations in visualizing 3D anatomy, it has been a challenging approach to precisely detect or quantify the local anesthetic dissemination in the plane between Internal oblique and Transverse abdomini muscle.

However, even with this limitation we were able to get the desired prolonged analgesic effect and decreased requirement of rescue analgesia in USG guided ILIH nerve block as compared to infiltration group.

5. CONCLUSION

Post LSCS pain required effective method as inadequate pain relief can have hazardous effect on mother and mother baby born.

So, in our Study there were two groups.
1) USG guided ILIH nerve block group
2) InfiltrationAnaesthesia.

Here both the methods were effective but in our study we observe that USG guided ILIH nerve block group had better post operative analgesia and less requirement of rescue analgesia.

Hereby, we conclude that USG guided ILIH nerve block is better method for providing post operative analgesia than infiltration in post LSCS method.

6. Financial Support And Sponsorship: None.

7. Conflicts Of Interest: None.

Clinical Trial Registration Number: REF/2022/04/042266

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