

ORIGINAL ARTICLE

Comparison of Mean Pain Score with Inguinal Block under General Anesthesia versus Subarachnoid Block in Adult Patients Undergoing Inguinal Hernioplasty

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Surgical repair of an inguinal hernia is one of the most common procedures in the world. Most abdominal wall hernias are caused by this condition.^{1,2} If you want to have your hernia surgically repaired, you should do so in a hospital with the best possible facilities. Modern hernia surgical management aims at low recurrence and early mobilization of the patients. Using regional anaesthetic for inguinal hernia repair has been shown to reduce postoperative problems and allow patients to be discharged practically immediately. Outpatient anaesthesia for this procedure is safe and effective. Outpatient inguinal hernia repair under spinal anaesthetic is another option.^{3,4} Anesthesia administered locally has the best clinical and economic outcomes, according to numerous retrospective and randomised controlled studies.⁵

Both spinal and local anaesthetic affect only a small area of the body and have no effect on the other organs or the respiratory system. Complete sensory and motor blockage is possible with spinal anaesthesia. The disadvantages of spinal anaesthesia are the possibility of hypotension and postdural puncture headache. This procedure, which involves the blocking of the ilioinguinal and hypogastric nerves as well as the infiltration of the surgical layers, is only successful if the surgeon has a complete understanding of how the nerves are structured and how they function. Depending upon length of surgery local anesthesia can well extend into postoperative period thereby reducing systemic analgesic requirement.⁶

Analysis of a study showed that total postoperative VAS measurements, did not show a significant difference in pain between inguinal block under general anesthesia [2.4±1.0] versus subarachnoid block [2.7±1.0], (p-value=0.137).⁷ While another study showed significant difference between both groups for mean

pain score after 4 hours of surgery [inguinal (local): 5.91±1.08 vs. subarachnoid (spinal): 6.44±1.00], (p-value=0.01).⁸

Through this study, I want to prove that inguinal block under general anesthesia offers better pain control over subarachnoid block as measured by visual analogue scale. Although available studies show advantage of inguinal block under general anesthesia over subarachnoid block in terms of pain control but they were done using small sample size. The rationale of my study is to improve the power of study by using larger sample size.

MATERIAL AND METHODS

After taking permission from Institutional Review Board of the hospital this randomized controlled trial was conducted at department of Department of Anesthesia, Sir Ganga Ram Hospital, Lahore from January 2021 to June 2021. Patients provided written informed permission after being informed of their options. Sample size of 200 patients is calculated using WHO calculator with 95% confidence level, 80% power of test and mean pain score to be 5.91±1.08 with inguinal block under GA and 6.44±1.00 with subarachnoid block.⁸ Patients of age range 20-50 years of both genders undergoing elective inguinal hernioplasty were included in this study. Patients with cardiac problems, muscle weakness, polio patients (assessed through medical record and clinical examination), patients undergoing Laparoscopic hernioplasty, receiving oral or i/v analgesia pre-operatively, with history of allergic to bupivacaine, with history of psychiatric disorder were excluded from the study.

In group A, patients were given inguinal block and in group B, patients were given subarachnoid block. In Inguinal block group, a 10mL of Bupivacaine (0.5%) will be given at junction of 2/3 from umbilicus and 1/3 from anterior superior iliac spine after administration of general anesthesia with laryngeal mask airway.

During surgery, anesthesia care and sedation was monitored by an anesthesiologist. Subarachnoid block was performed by a L3-4 or L4-5 intervertebral midline approach. The subarachnoid injection was contained a hyperbaric bupivacaine (0.75%). All surgeries were done by a single surgical team to control bias in the study. Patients were followed at 1, 2 and finally on 4 hours after surgery for measurement of pain. The acquired data was entered and analysed using SPSS 16.0. The mean and standard deviation of quantitative data such as age and pain score (VAS) will be reported. Frequency and percentages will be used to display qualitative factors like gender. The mean pain score was compared between the two groups using a t-test. A significant result is one with a p-value 0.05.

RESULTS

This study involved 200 patients, with a mean age of 39.63 ± 6.50 years and a min and max age of 25 and 50 years, accordingly shown in table 1. Out of total 200 patients, 186 (93%) were males and 14 (7%) were females. The male-to-female ratio was 13.3:1 displayed at Fig#1. Out of total 200 patients, the mean pain score at one hour was 0.97 ± 0.92 , observed with minimum and maximum pain score at one hour was 0 and 3 respectively. The mean pain score at second hour was 1.105 ± 0.97 with minimum and maximum pain score at second hour was 0 and 4 respectively. The mean pain score at third hour was 1.41 ± 1.14 with minimum and maximum pain score 0 and 5 respectively.

Table 1: Descriptive statistics of the participants

Variables	Characteristics	Participants
Age	Mean \pm SD	39.63 ± 6.50
	Range	25- 50
Gender	Male	186(93%)
	Female	14(7%)
Pain score at different time intervals		
Pain score	1st hour	0.97 ± 0.92
	2nd hour	1.105 ± 0.974
	3rd hour	1.41 ± 1.14
	4th hour	2.34 ± 1.55

Table 2: Distribution of pain score at various hours in accordance with study groups

Pain score at	Study Groups		p-value
	Inguinal block	Subarachnoid block	
1 hour	0.76 ± 0.87	1.18 ± 0.92	0.001*
2 hour	0.88 ± 0.84	1.33 ± 1.04	0.001*
3 hour	1.02 ± 0.92	1.80 ± 1.20	0.000*
4 hour	1.59 ± 1.07	3.09 ± 1.60	0.000*

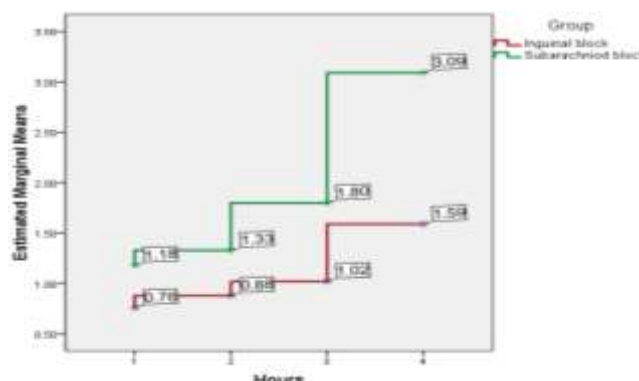


Figure 1: Pain score at various hours in accordance with study groups

The mean pain score at fourth hour was 2.34 ± 1.55 with minimum and maximum pain score of 0 and 6 respectively shown in table 2. The mean pain score at 1st hour in inguinal group was 0.76 ± 0.87 whereas pain score in subarachnoid block was 1.18 ± 0.92 . Similarly after 2nd hour inguinal group pain score was 0.88 ± 0.84

and with Subarachnoid block was 1.33 ± 1.04 . At 3rd hour, with inguinal block mean pain score was 1.02 ± 0.92 and with Subarachnoid block was 1.80 ± 1.20 . At 4th hour, with inguinal block mean pain score was 1.59 ± 1.07 and with Subarachnoid block was 3.09 ± 1.60 . Statistically there is highly significant difference of mean pain score between both groups i.e. p-value < 0.05 as presented in table 3.

Table 3: Comparison of mean pain score in both groups at different time intervals

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Intercept	1696.531	1	1696.531	402.201	0.000
group	124.031	1	124.031	29.404	0.000
Error	835.188	198	4.218		

DISCUSSION

Hernia in the groin is the world's most common surgical condition and the oldest in history. Most cases occur in people aged 40 to 50, however the patients in our study ranged in age from 38 to 48. (44 percent). Inguinal hernias occur in 8 percent of female patients, however our inclusion criteria only allowed 186 individuals who were male. The prevalence of inguinal hernia on the right side (>70%) was higher than in comparable research in Pakistan. Many studies have shown that hernia is a disease of the working class, with 67% of our patients being manual workers, compared to 56% of the general population.⁹

About one-third of the patients who participated in the trial were women, according to our findings, which were corroborated by Ponka JL. A hernia in the groin is a common surgical complication. Three times as many men are affected as women.¹⁰ Patients who are getting surgery worry the most about pain. It's a common misconception that pain is a reliable sign of tissue damage, but that's not always the case. Sensory neurons (nociceptors) and brain afferent pathways promote the sense of pain.¹¹

During inguinal hernia repair under local anaesthesia, 23 patients (or 50%) reported some discomfort, whereas the other 23 patients (or 50%) reported no discomfort, according to the Earle AS 124 study on 46 patients. 12 According to a study conducted by Baskerville PA et al. on 129 patients performed under local anaesthesia, 93% of patients reported no pain during surgery, whereas 7% reported discomfort.¹³ It is possible that if dissection of the sac is difficult due to adhesions, local anaesthesia will have to be converted to general anaesthesia in cases with big hernia treated under local anaesthesia.¹⁴

When compared to patients who had spinal anaesthesia, our results indicated VAS scores of 15 ± 1.4 in the local anaesthetic group and 34 ± 3.2 in the spinal anaesthetic group. Patients who underwent local anaesthesia had less post-operative pain than those who underwent general anaesthesia, according to the Pradeep Goyal study.¹⁶

Before the ilioinguinal and iliohypogastric nerve block (IINB) lowers postoperative analgesics following inguinal herniorrhaphy, as demonstrated in a study by Toivonen J et al. In day surgery patients receiving inguinal herniorrhaphy with general or spinal anaesthesia, the impact of an IINB on postoperative complications and emission profile was therefore examined.¹⁷

The peritoneum, inadequate analgesics, urine retention, and wound infection all contribute to post-operative pain.¹⁸ In addition to the ilio inguinal and hypogastric nerves, the genital branch of the genitofemoral nerve can be found. Excessive nerve manipulation might be strictly avoided to prevent it.^{19,20}

CONCLUSION

It was concluded from results of this study that inguinal block is more beneficial in controlling pain after inguinal hernia surgery as compared to subarachnoid block. Now we are able to implement

the use of inguinal block under general anesthesia instead of using spinal anesthesia for inguinal hernia surgery..

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