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STUDY OF INTRATHECAL FENTANYL AND BUTORPHANOL AS AN ADJUVANT TO INTRATHECAL BUPIVACAINE IN INFRA- UMBILICAL SURGERIES

Anaesthesiology

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ABSTRACT

Present study was conducted in the department of Anaesthesiology in Durgapur Steel Plant Hospital, Durgapur, West Bengal. GROUP A (F)- 55 patients who were received intrathecal 0.5% hyperbaric bupivacaine 3ml with fentanyl 25 microgram (0.5 ml) total 3.5ml [n=55].. GROUP B (B)- 55 patients who were received receive intrathecal 0.5%hyperbaric bupivacaine 3 ml with butorphanol 250 microgram(0.25 ml) by insulin syringe and normal saline 0.25 ml (total 3.5 ml) [n=55]. We found that in Group-A (F), 34(61.8%) patients had highest sensory level T6 and 21(38.2%) patients had highest sensory level T8. 35(63.6%) patients had highest sensory level T6 and 20(36.4%) patients had highest sensory level T8. We found that in Group-A (F), the mean of time spinal drugs to sensory level (mean±s.d.) of patients was 1.5091 ± .5045 mints. In Group-B (B), the mean of time spinal drugs to sensory level (mean±s.d.) of patients was 1.4727 ± .5039 mints. In Group-A (F), 4(7.3%) patients had pruritis. In Group-B (B), 2(3.6%) patients had pruritis. Association of pruritis in two groups was not statistically significant (p=0.4010).In Group-A (F), 5(9.1%) patients had nausea& vomiting. In our study, We concluded that both fentanyl and butorphanol along with bupivacaine, provided adequate anesthesia and analgesia; but significantly lesser analgesic requirement was observed in the group receiving intrathecal butorphanol and bupivacaine mixture compared to intrathecal fentanyl and bupivacaine mixture.

KEYWORDS

Intrathecal Fentanyl , Butorphanol, Bupivacaine And Infra- Umbilical Surgeries

INTRODUCTION

Spinal anaesthesia is the fastest, most predictable and reliable form of regional anaesthesia. By adding a small dose of narcotics to local anaesthetic solution the duration of anaesthesia can be significantly prolonged. [1]

Fentanyl is a commonly used adjuvant with local anaesthetic as it is a potent, synthetic opioid analgesic with a rapid onset and short duration of action.[2] But it having problems of pruritus, postoperative nausea, vomiting, respiratory depression and urinary retention due to mu agonism.

Butorphanol is a partial agonist and antagonist having the mu opioid receptor competitive antagonist activity and partial agonist activity at the kappa opioid receptor. [3] Butorphenol when administer intrathecally it binds to kappa receptor in the brain and spinal cord areas which is involved in nociception producing analgesia and sedation without side effect associated with mu receptors. Additionally, kappa- agonist can cause dysphoria at therapeutic or supertherapeutic doses, this gives butorphanol a lower potential for abuse than other opioid drugs. For this butorphanol is widely available without restriction as compared to fentanyl and other potent opioids .Butorphanol is also quite effective at reducing post-operative shivering.

Till date only few studies done so far that compared the effectiveness of fentanyl with butorphenol as adjuvant to local anaesthetic in subarachnoid block. Also there is a controversy regarding the dose of intrathecal butorphenol used in various studies. [4,5]

Thus, in this present prospective, double blind, randomized, controlled study we will compare the effectiveness of intrathecal fentanyl to butorphanol in infraumbilical surgeries.

It has been observed from various studies conducted previously that equivalent efficacy of butorphenol to fentanyl is obtained with 10 times intravenous dosage of butorphenol as compred to fentanyl. [6]

The present study is being undertaken to compare the safety and efficacy of anesthesia and analgesia of intrathecal bupivacaine-fentanyl mixture with intrathecal bupivacaine- butorphanol mixture for infraumbilical surgeries. This study is being conducted as only a limited number of studies have explored the use of intrathecal butorphanol in human subjects previously.

To compare the effectiveness of intrathecal fentanyl and butorphanol in infraumbilical surgeries.

MATERIALS AND METHODS:

Infraumbilical surgeries done in department of Anaesthesiology in Durgapur Steel Plant Hospital, Durgapur, West Bengal. Study was conducted on all 110 healthy patients fulfilling the inclusion criteria that were posted for the infra-umbilical operation under spinal anaesthesia from July 2017 to June 2018

STUDY TECHNIQUES :

After institutional ethical committee approval and obtaining written informed consent from all patients, 110 cases of ASA grade I & II between the ages of 18-60 yrs of either sex undergoing elective infraumbilical surgeries including gynecological surgeries was allocated randomly by computer generated random numbers into two groups of 55 each. Group A was receive intrathecal 0.5% hyperbaric bupivacaine 3ml with fentanyl 25 microgram (0.5 ml) total 3.5ml [n=55]. Group B was receive intrathecal 0.5%hyperbaric bupivacaine 3 ml with butorphanol 250 microgram(0.25 ml) by insulin syringe and normal saline 0.25 ml (total 3.5 ml) [n=55].

All drug solutions was prepared by the anaesthesiologist who was performed the spinal blocks. To provide blindness, after performing the block, this anaesthesiologist was not participated in the follow up of the patients. Block quality, duration, haemodynamic parameters, occurance of adverse events were observed by another anaesth esiologist who was not know the group allocation.

All patients were undergo complete general physical examination and systemic examination, before taking into operating room. All was explained about the visual analogue scale scoring [VAS] system for pain during the pre-anesthetic check-up. In the operation theatre, an intravenous line of 18 G was established on non dominant hand. Baseline heart rate, systolic blood pressure, diastolic blood pressure,

mean blood pressure, respiratory rate and peripheral arterial oxygen saturation (SPO2) was recorded for all subjects .All patients was receive 10 ml/kg of lactated ringer's solution as preload within 20-30 minutes. Subarachnoid block was performed under strict aseptic conditions in the sitting positions at the level of L3L4 intervertebral space using 25G Quincke spinal needle. The midline approach was used to perform the spinal blocks after infiltrating the skin with 1ml of 2% lidocaine. Following the subarachnoid block, the patient was put in supine position. Intraoperative vitals data was recorded at 5 minutes intervals for the first 30 minutes from the time of injection of spinal solution and there after every 15 minutes for the complete period of surgery. This data was recorded by the primary investigator, who was unaware of the patient allocation. Hypotension more than 20% of base line was treated with fluid boluses and 6mg mephentermine i.v. boluses, while bradycardia [HR<50bpm] was treated with 0.6mg iv atropine bolus. The highest level of sensory block was determined in the midclavicular line bilaterally, by pin prick test using a 20 G hypodermic needle every 2 minutes till the level was stabilized for four consecutive tests. Sensory testing was performed at 15 minutes interval till S2 segment regression. Motor block was assessed using the modified bromage scale, till achievement of the highest motor level. Side effects such as hypotention, bradycardia, nausea, vomiting, sedation, pruritus ,shivering and respiratory depression (RR<9 or SPO2< 90) was recorded. Sedation was recorded by Ramsay sedation score. The quality of postoperative analgesia was assessed using VAS at 15 min, 30 min and thereafter every 30 minutes, till 2 hours postoperatively; and then every hour, till 6 hours postoperative duration. The time of first complain of pain was recorded. When VAS score > 4 patients complaining of pain was treated with 75 mg Diclofenac Sodium aquous in 100 ml of 0.9% saline through i.v route as rescue analgesic. Consumpsion of total rescue analgesics in 24 hrs post-operative period was also be noted.

STATISTICALANALYSIS:

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Paired t-tests were a form of blocking and had greater power than unpaired tests. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate. p-value ≤ 0.05 was considered for statistically significant.

RESULTANDANALYSIS

It was found that in Group-A (F), the mean of age (Mean±SD.) of patients was 36.5091 ± 9.1588 years. In Group-B (B), the mean of age (Mean±SD.) of patients was 36.4727 ± 10.5477 years. Difference of mean age in two groups was not statistically significant (p=0.9846)

It was found that in Group-A (F), 18(32.7%) patients had female and 37(67.3%) patients had male. In Group-B (B), 15(27.3%) patients had female and 40(72.7%) patients had male. Association of sexin two groups was not statistically significant (p=0.5325).

It was found that in Group-A (F), the mean of BMI (mean±s.d.) of patients was 22.1127 ± 1.5279 kg/m^2. In Group-B (B), the mean of BMI (mean±s.d.) of patients was 22.2145 ± 1.5369 kg/m^2. Difference of mean BMI in two groups was not statistically significant (p=0.7282).

It was found that in Group-A (F), the mean of ASA (mean±s.d.) of patients was 1.5091 ± .5045. In Group-B (B), the mean of ASA (mean±s.d.) of patients was 1.4727 ± .5039. Difference of mean ASA in two groups was not statistically significant (p=0.7060).

It was found that in Group-A (F), 34(61.8%) patients had highest sensory level T6 and 21(38.2%) patients had highest sensory level T8. In Group-B (B), 15(27.3%) patients had female and 40(72.7%) patients had male. 35(63.6%) patients had highest sensory level T6 and 20(36.4%) patients had highest sensory level T8. Association of sexin two groups was not statistically significant (p=0.8436).

It was found that in Group-A (F), the mean of time spinal drugs to sensory level (mean±s.d.) of patients was 1.5091 ± .5045 mints. In Group-B (B), the mean of time spinal drugs to sensory level (mean±s.d.) of patients was 1.4727 ± .5039 mints. Difference of mean time spinal drugs to sensory level in two groups was not statistically significant (p=0.1306).

It was found that in Group-A (F), the mean of segment sensory level (mean±s.d.) of patients was 41.9455 ± 1.7365 mints. In Group-B (B), the mean of segment sensory level (mean±s.d.) of patients was 50.5636 ± 4.4379 mints. Difference of mean segment sensory level in two groups was statistically significant (p<0.0001).

It was found that in All patients had maximum motor block achieved (modified borage scale) 1.

It was found that in Group-A (F), the mean of time spinal drugs to maximum motor block (mean±s.d.) of patients was 5.2745 ± .3233 mints. In Group-B (B), the mean of time spinal drugs to maximum motor block (mean±s.d.) of patients was 5.2727 ± .3217 mints. Difference of mean time spinal drugs to maximum motor block in two groups was not statistically significant (p=0.9765).

It was found that in Group-A (F), the mean of time modified borage scale of 3 (mean±s.d.) of patients was 81.2364 ± 4.8799. In Group-B (B), the mean of time modified borage scale of 3 (mean±s.d.) of patients was 109.8364 ± 2.6159. Difference of mean time modified borage scale of 3in two groups was statistically significant (p<0.0001).
It was found that in Group-A (F), the mean of duration of the operation (mean±s.d.) of patients was 73.2727 ± 14.6950. In Group-B (B), the mean of duration of the operation (mean±s.d.) of patients was 75.3636 ± 13.5351. Difference of mean duration of the operation in two groups was statistically significant (p=0.4393).

It was found that in Difference of mean SBP at arrival to O.T in two groups was not statistically significant (p=0.1398). Difference of mean SBP at 0 in two groups was not statistically significant (p=0.4275). Difference of mean SBP at 5 in two groups was not statistically significant (p=0.5766). Difference of mean SBP at 10 in two groups was not statistically significant (p=0.4322). Difference of mean SBP at 15 in two groups was not statistically significant (p=0.3039). Difference of mean SBP at 20 in two groups was statistically significant (p=0.0008). Difference of mean SBP at 25 in two groups was not statistically significant (p=0.1554). Difference of mean SBP at 30 in two groups was not statistically significant (p=0.1097). In Difference of mean SBP at 45 in two groups was not statistically significant (p=0.0730). Difference of mean SBP at 60 in two groups was statistically significant (p=0.0526). Difference of mean SBP at 75 in two groups was not statistically significant (p=0.2577). Difference of mean SBP at 90 in two groups was not statistically significant (p=0.1066).

It was found that in Difference of mean DBP at arrival to O.T in two groups was not statistically significant (p=0.4644). Difference of mean DBP at 0 in two groups was not statistically significant (p=0.1187). Difference of mean DBP at 5 in two groups was statistically significant (p=0.8480). Difference of mean DBP at 10 in two groups was not statistically significant (p=0.5126). Difference of mean DBP at 15 in two groups was not statistically significant (p=0.5201).

Difference of mean DBP at 20 in two groups was not statistically significant (p=0.2022). Difference of mean DBP at 25 in two groups was not statistically significant (p=0.0987). Difference of mean DBP at 30 in two groups was not statistically significant (p=0.3306). Difference of mean DBP at 45 in two groups was not statistically significant (p=0.0563). Difference of mean DBP at 60 in two groups was not statistically significant (p=0.3993). Difference of mean DBP at 75 in two groups was not statistically significant (p=0.3700). Difference of mean DBP at 90 in two groups was not statistically significant (p=0.3658).

It was found that in Difference of mean MAP at arrival to O#T in two groups was not statistically significant (p=0.3571). Difference of mean MAP at 0 in two groups was statistically significant (p=0.0304). Difference of mean MAP at 5 in two groups was not statistically significant (p=0.5403). Difference of mean MAP at 10 in two groups was not statistically significant (p=0.5438). Difference of mean MAP at 15 in two groups was not statistically significant (p=0.1901). Difference of mean MAP at 20 in two groups was statistically significant (p=0.0481). Difference of mean MAP at 25 in two groups was statistically significant (p=0.0266). Difference of mean MAP at 30 in two groups was not statistically significant (p=0.1656). Difference of mean MAP at 45 in two groups was statistically significant (p=0.0163). Difference of mean MAP at 60 in two groups was not statistically significant (p=0.1214). Difference of mean MAP at 75 in

two groups was not statistically significant (p=0.1214). Difference of mean MAP at 90 in two groups was not statistically significant (p=0.1264)

It was found that in Difference of mean HR at arrival to OT in two groups was not statistically significant (p=0.2838). Difference of mean HR at 0in two groups was not statistically significant (p=0.3684). Difference of mean HR at 5in two groups was not statistically significant (p=0.2509).Difference of mean HR at 10in two groups was statistically significant (p=0.0433). Difference of mean HR at 15in two groups was not statistically significant (p=0.4487). Difference of mean HR at 20in two groups was statistically significant (p=0.0045). Difference of mean HR at 25in two groups was not statistically significant (p=0.3450). Difference of mean HR at 30in two groups was not statistically significant (p=0.9329). Difference of mean HR at 45in two groups was not statistically significant (p=0.5637). Difference of mean HR at 60in two groups was statistically significant (p=0.0130). Difference of mean HR at 75in two groups was not statistically significant (p=0.5466). Difference of mean HR at 90in two groups was not statistically significant (p=0.4128).

It was found that in Difference of mean SpO2 At arrival to O#T in two groups was statistically significant (p=0.0413). Difference of mean SpO2 at 0 in two groups was statistically significant (p=0.0436). Difference of mean SpO2 at 5 in two groups was not statistically significant (p=0.0872). Difference of mean SpO2 at 10 in two groups was not statistically significant (p=0.3891). Difference of mean SpO2 at 15 in two groups was not statistically significant (p=0.6748). Difference of mean SpO2 at 20 in two groups was not statistically significant (p=0.2203). Difference of mean SpO2 at 25 in two groups was not statistically significant (p=0.2706). Difference of mean SpO2 at 30 in two groups was statistically significant (p=0.0371). Difference of mean SpO2 at 45 in two groups was not statistically significant (p=0.6791). Difference of mean SpO2 at 60 in two groups was not statistically significant (p=0.8730). Difference of mean SpO2 at 75 in two groups was not statistically significant (p=0.2228). Difference of mean SpO2 at 90 in two groups was not statistically significant (p=0.2694).

It was found that in Difference of mean RR Pre-op in two groups was statistically significant (p=0.0010). Difference of mean RR at 0in two groups was statistically significant (p=0.0004). Difference of mean RR at 5 in two groups was statistically significant (p=0.0004). Difference of mean RR at 10 in two groups was statistically significant (p=0.0001). Difference of mean RR at 15 in two groups was statistically significant (p=0.0017). Difference of mean RR at 20 in two groups was statistically significant (p=0.0004). Difference of mean RR at 25 in two groups was not statistically significant (p=0.8599). Difference of mean RR at 30 in two groups was statistically significant (p=0.0016). Difference of mean RR at 45 in two groups was statistically significant (p=0.0031). Difference of mean RR at 60 in two groups was statistically significant (p=0.0030). Difference of mean RR at 75in two groups was statistically significant (p=0.0020). Difference of mean RR at 90 in two groups was not statistically significant (p=0.1378).

It was found that in two groups no patients had sedation. It was found that in two groups no patients had bradycardia.It was found that in two groups no patients had hypotension.It was found that in Group-A (F), 4(7.3%) patients had pruritis. In Group-B (B), 2(3.6%) patients had pruritis. Association of pruritisin two groups was not statistically significant (p=0.4010). It was found that in two groups no patients had respiratory depression. It was fund that in Group-A (F), 5(9.1%) patients had nausea& vomiting. In Group-B (B), 2(3.6%) patients had nausea& vomiting. Association of nausea& vomiting in two groups was not statistically significant (p=0.2412). It was found that in two groups, no patients had shivering.

It was found that in Group-A (F), the mean of consumption of rescue analgesia (mean±s.d.) of patients was 287.2727 ± 7.3723. In Group-B (B), the mean of consumption of rescue analgesia (mean±s.d.) of patients was 377.4182 ± 10.2536. Difference of mean consumption of rescue analgesia in two groups was statistically significant (p<0.0001).

It was found that in two groups all patients had ram say sedation scale 2.

DISCUSSION

We found difference of mean age in two groups was not statistically significant (p=0.9846). Association of sex in two groups was not statistically significant (p=0.5325). Difference of mean BMI in two groups was not statistically significant (p=0.7282).

Dr. Rajkumar N Jaisinghani et al [7] the mean age (mean± s.d.) of patients was 36.51 yrs. ± 10.21years in group-A and 38.70yrs. ± 11.54 years in group-B. Nama Nagarjuna Chakravarthy et al [8] the mean age (mean± s.d.) of patients was 38.43 ± 9.56 years in group-A and 39.06 ± 9.83 years in group-B. In group A, 8 patients had female and 22 patients had male. In group B, 7 patients had female and 23 patients had male.

Kumar B et al [9] found that the two groups were comparable with regards to age, gender, weight, height and duration of surgery. The mean baseline values of HR, SBP, DBP, RR and SpO2 were comparable among the groups.

Kumar B et al [9] found that the median highest sensory level achieved and the times to reach peak sensory level were comparable among the two groups. Significantly slower block regression to S 2 level was observed in the group receiving butorphanol as compared to fentanyl (P=0.0230).

Tuhin Vashishth et al [10] found that the mean time to achieve sensory block up to T8 level was 4.78±2.16 minutes in Group I, 3.58±1.33 minutes in Group II and 3.24±1.04 minutes in Group III. Statistically, there was a significant intergroup difference In Group I, there was 1 and in Group II there were 2 patients who could not achieve the sensory block up to T8 level till 15 minutes.

Kumar B et al [9] found that the time of onset of maximum motor blockade (P=0.1288) and time to reach grade 1 motor blockade (P=0.1080) were similar among the two groups.

Kumar B et al [9] found that a higher number of patients in the fentanyl group requested for rescue analgesia during the postoperative study period than the butorphanol group (9 versus 2; P=0.0238). The patients in the fentanyl group requested rescue analgesia earlier than patients in the butorphanol group as the average times to first request for rescue analgesia were 308.6±14.9 and 365.9±12.3 minutes, respectively (P=0.0254).

Prabhakaraiah UN et al [11] found that maximum motor block in Group BN was achieved in 5.80 ± 2.48, whereas in Group BF, it was 5.40 ± 2.42 min with P = 0.529, and duration of motor block was 222.50 ± 37.50 in Group BN and in Group BF was 227.50 ± 50.94 with P = 0.667.

We found that in Group-A (F), 34(61.8%) patients had highest sensory level T6 and 21(38.2%) patients had highest sensory level T8. In Group-B (B), 15(27.3%) patients had female and 40(72.7%) patients had male. 35(63.6%) patients had highest sensory level T6 and 20(36.4%) patients had highest sensory level T8. Difference of mean time spinal drugs to sensory level in two groups was not statistically significant (p=0.1306). Difference of mean segment sensory level in two groups was statistically significant (p<0.0001). In Group-A (F), the mean of time spinal drugs to maximum motor block (mean±s.d.) of patients was 5.2745 ± .3233 mints. In Group-B (B), the mean of time spinal drugs to maximum motor block (mean±s.d.) of patients was 5.2727 ± .3217 mints. Difference of mean time spinal drugs to maximum motor block in two groups was not statistically significant (p=0.9765).In Group-A (F), the mean of time modified borage scale of 3 (mean±s.d.) of patients was 81.2364 ± 4.8799. In Group-B (B), the mean of time modified borage scale of 3 (mean±s.d.) of patients was 109.8364 ± 2.6159. Difference of mean time modified borage scale of 3in two groups was statistically significant (p<0.0001).

Tuhin Vashishth et al [10] found that Grade III motor block was achieved earliest in the patients receiving Nalbuphine followed by the patients receiving Fentanyl.

Difference of mean duration of the operationin two groups was statistically significant (p=0.4393).

We showed the mean values of HR, SBP, DBP, RR and SpO2 at different time interval were comparable among the groups.

Tuhin Vashishth et al [10] found that significantly longer duration as compared to Group II.

The use of opioids in conjunction with local anesthetic for spinal anesthesia has been associated with decreased pain scores and reduced analgesic requirement in the post-operative period. [12, 13] Results of previous studies have demonstrated that intrathecal opioids not only enhance analgesia when added to subtherapeutic doses of local anesthetics but also do not prolong recovery.[14,15,16]

Kumar B et al[9] found that Seven patients in the fentanyl-treated group and two patients in the butorphanol-treated group had hypotension in the peri-operative period (P=0.0771). Bradycardia, responsive to a single dose of intravenous atropine was seen in two patients in the group receiving fentanyl as compared to none in the butorphanol group (P=0.2468). Pruritis was observed in five patients receiving fentanyl as compared to none of the patients who received butorphanol (P=0.0273). Although six patients in the butorphanol group had sedation compared to none in the fentanyl group (P=0.0127); none of the patients developed respiratory depression. Four patients in the fentanyl group and three in the butorphanol group required urinary catheterisation due to difficulty in voiding. Nausea and vomiting were not reported by any of the patients.

We found that in two groups no patients had sedation, bradycardia respiratory depression. Shivering and hypotension. In Group-A (F), 4(7.3%) patients had pruritis. In Group-B (B), 2(3.6%) patients had pruritis. Association of pruritis in two groups was not statistically significant (p=0.4010).In Group-A (F), 5(9.1%) patients had nausea& vomiting. In Group-B (B), 2(3.6%) patients had nausea& vomiting. Association of nausea& vomiting in two groups was not statistically significant (p=0.2412). Difference of mean consumption of rescue analgesia in two groups was statistically significant (p<0.0001). In our study, both fentanyl and butorphanol along with bupivacaine, provided adequate anesthesia and analgesia; but significantly lesser analgesic requirement was observed in the group receiving intrathecal butorphanol and bupivacaine mixture compared to intrathecal fentanyl and bupivacaine mixture.

CONCLUSION

In conclusion, both fentanyl and butorphanol given intrathecally with 3 mg of hyperbaric bupivacaine provide effective and safe anesthesia for infra- umbilical surgeries with minor side effects. Intrathecal bupivacaine-butorphanol mixture provides longer duration of sensory and motor blockade and better quality of analgesia than intrathecal fentanyl-bupivacaine mixture. Addition of butorphanol to bupivacaine in infra- umbilical surgeries significantly prolongs the duration of analgesia and motor block and is a remarkably safe and less side effect method of providing post-operative analgesia.

Table: Distribution of mean age, BMI, ASA, Time spinal drugs to sensory level (mints), segment sensory level (mints)' Time spinal drugs to Maximum motor block (mints)' Time Modified borage scale of 3' Duration of the operation and Consumption of rescue analgesia in two grope

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Age	Group-A (F)	55	36.5091	9.1588	21.0000	56.0000	36.0000	0.9846
	Group-B (B)	55	36.4727	10.5477	22.0000	67.0000	34.0000	
BMI	Group-A (F)	55	22.1127	1.5279	18.9000	24.2000	21.9000	0.7282
	Group-B (B)	55	22.2145	1.5369	18.9000	24.2000	22.1000	
ASA	Group-A (F)	55	1.5091	.5045	1.0000	2.0000	2.0000	0.7060
	Group-B (B)	55	1.4727	.5039	1.0000	2.0000	1.0000	
Time spinal drugs to sensory level (mints)	Group-A (F)	55	3.0836	.2158	2.8000	3.8000	3.0000	0.1306
	Group-B (B)	55	3.1509	.2464	2.8000	3.8000	3.1000	
segment sensory level (mints)	Group-A (F)	55	41.9455	1.7365	40.0000	46.0000	41.0000	<0.0001
	Group-B (B)	55	50.5636	4.4379	40.0000	57.0000	51.0000	
Time spinal drugs to Maximum motor block (mints)	Group-A (F)	55	5.2745	.3233	4.8000	6.0000	5.3000	0.9765
	Group-B (B)	55	5.2727	.3217	4.8000	6.0000	5.3000	
Time Modified borage scale of 3	Group-A (F)	55	81.2364	4.8799	75.0000	90.0000	80.0000	<0.0001
	Group-B (B)	55	109.8364	2.6159	105.0000	115.0000	110.0000	
Duration of the operation	Group-A (F)	55	73.2727	14.6950	45.0000	90.0000	75.0000	0.4393
	Group-B (B)	55	75.3636	13.5351	45.0000	90.0000	80.0000	
Consumption of rescue analgesia	Group-A (F)	55	287.2727	7.3723	270.0000	297.0000	290.0000	<0.0001
	Group-B (B)	55	377.4182	10.2536	360.0000	400.0000	379.0000	

Table: Association of sex, Highest sensory level, Maximum motor block achieved (modified borage scale), sedation and bradycardia in two groups

		Group-A (F)	Group-B (B)	TOTAL	Chi-square value	p-value
SEX	**Female**	18	15	33	0.3896	0.5325
	Row %	54.5	45.5	100.0		
	Col %	32.7	27.3	30.0		
	Male	37	40	77		
	Row %	48.1	51.9	100.0		
	Col %	67.3	72.7	70.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Highest sensory level	**T6**	34	35	69	0.0389	0.8436
	Row %	49.3	50.7	100.0		
	Col %	61.8	63.6	62.7		
	T8	21	20	41		
	Row %	51.2	48.8	100.0		
	Col %	38.2	36.4	37.3		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		

Maximum motor block achieved (modified borage scale)	**1**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Sedation	**N**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
bradycardia	**NO**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		

Table: Association of Hypotension, Pruritis, Respiratory depression and Sedation in two groups

		Group-A (F)	Group-B (B)	TOTAL	Chi-square value	p-value
Hypotension	**NO**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Pruritis	**NO**	51	53	104	0.7051	0.4010
	Row %	49.0	51.0	100.0		
	Col %	92.7	96.4	94.5		
	YES	4	2	6		
	Row %	66.7	33.3	100.0		
	Col %	7.3	3.6	5.5		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Respiratory depression	**NO**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Sedation	**N**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		

Table: Association of Respiratory depression, Nausea& vomiting, Shivering and Ramsay sedation scale in two groups

		Group-A (F)	Group-B (B)	TOTAL	Chi-square value	p-value
Respiratory depression	**NO**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Nausea& vomiting	**NO**	50	53	103	1.3731	0.2412
	Row %	48.5	51.5	100.0		
	Col %	90.9	96.4	93.6		
	YES	5	2	7		
	Row %	71.4	28.6	100.0		
	Col %	9.1	3.6	6.4		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Shivering	**NO**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		

Ramsay sedation scale	**2**	55	55	110	NA	NA
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
	TOTAL	55	55	110		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		

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