Al-Azhar Med. J. (Surgery). *Vol. 50(3), July, 2021, 1599-1612*
DOI: 10.21608/amj.2021.178246
https://amj.journals.ekb.eg/article_178246.html

COMBINATION OF ULTRA DOSES BUPIVACAINE PLUS FENTANYL FOR SPINAL ANESTHESIA IN OUT-PATIENT ANAL SURGERIES

By

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ABSTRACT

Background: Minor Anal surgeries such as piles or fissures are common problems among populations which sometimes need surgical interventions and spinal anesthesia is the optimal option for these procedures.

Objective: To assess the efficacy of combination of ultra-dose of intrathecal Bupivacaine plus fentanyl as an analgesic procedure for out-patient anal surgeries.

Patients and Methods: After approval by the local ethical committee, a prospective, controlled, clinical, randomized study was carried out on 200 patients, and randomly allocated into two equal groups: Group A: received (2.5 mg) 0.5% bupivacaine plus (25µg) fentanyl, and Group B: received 5 mg 0.5% bupivacaine alone. An informed consent was taken from every patient subjected to this study.

Results: These studies showed that hemodynamics were more stable in (Fentanyl + Bupivacaine) group than in Bupivacaine only group. Usage of Fentanyl decreased postoperative pain and analgesic consumption in the first 6 hours after surgery along with longer pain free period compared to patients who were given Bupivacaine group.

Conclusion: Addition of (25µg) fentanyl to (2.5 mg) 0.5% bupivacaine prolonged the duration of sensory spinal block, and reduced the analgesic requirement during the early post-operative period without increasing the incidence of opioid-related side-effects except pruritus, or delaying hospital discharge in patients undergoing ambulatory anorectal surgery in comparison to using 5 mg 0.5% bupivacaine alone.

Keywords: Fentanyl, Bupivacaine, Anal surgeries.

INTRODUCTION

The prevalence of minor anorectal diseases in the adult population is 4 – 5%, and approximately 10% of cases require surgical treatment. Currently, 90% of anal surgeries are performed on an ambulatory basis *(Ferences, 2012)*. Spinal anesthesia for ambulatory surgery should be characterized by rapid onset and offset, easy administration, minimal expense, and minimal side-effects and complications *(Smith, 2013)*.

High doses of intrathecal bupivacaine can produce extensive sensory and motor block as well as unintended prolonged arterial hypotension due to sympathetic block resulting in delayed discharge from hospital. On the other hand, low dose of

bupivacaine is associated with a comparatively rapid recovery profile, but may not provide sufficient duration of analgesia *(Maroof et al, 2015)*.

An alternative treatment consisting of intrathecal administration of a combination of opioids and local anesthetics produces a well-documented synergistic effect without prolonged motor nerve block or delayed discharge. Studies have shown that fentanyl in combination with low dose bupivacaine intensifies the sensory blockade and lengthens its duration without increasing the intensity of the motor blockade or prolonging recovery *(Maves and Gebhart, 2012)*.

The present study aimed to assess the efficacy of adding Fentanyl to ultra-dose of intrathecal Bupivacaine as an analgesic procedure for out-patient anal surgeries.

PATIENTS AND METHODS

This prospective randomized single-blinded, clinical comparative study was conducted from August 2019 and ended at March 2020 in Al-Azhar University Hospitals (Al-Hussein and Sayed Galal) and approved by the ethics committee from the Department of Anesthesia of Faculty of Medicine, Al-Azhar University. Patients gave written informed consents.

The study concluded adult patients with American Society of Anesthesiologists (ASA) scoring of I –II who were underwent minor anal surgeries, e.g. hemorrhoids, anorectal fistulas, anal fissures or pilonidal sinuses, under spinal anesthesia were recruited for this study.

Patients were randomized into the two equal groups: Group A (Fentanyl group) received (2.5 mg) of 0.5% Bupivacaine + (25µg) Fentanyl and Group B (Bupivacaine group) received (5 mg) of 0.5% Bupivacaine only.

Patients were enrolled in the study according to the following criteria: American Society of Anesthesiology grade I, II (ASA I-II), patients of either sex, aged 20 to 60 years, BMI less than 30 Kg/M2, and scheduled for anal surgeries: piles, fissure, pilonidal sinus.

Exclusion criteria: Patient's refusal, patient in ASA groups III, IV, V, E, Body mass Index more than 30, pregnant female, abnormal coagulation profiles, skin infection, local contraindication to the technique, and patient on an analgesic regimen for any cause.

Pre-operative settings:

- Routine preoperative investigations were done to all patients including laboratory investigations as (complete blood picture, liver function tests, prothrombin time and partial thromboplastin time), chest x-ray and electrocardiogram. Demographic data as age, weight, and sex were recorded.
- The patients were fasting for 6 hours preoperatively. The procedure was done in the operating rooms (OR) under complete aseptic technique with prophylactic antibiotics (e.g. 2 gm ceftriaxone) 1 hour preoperatively.

Spinal anesthesia was performed at the L3 – L4 level in the sitting position using a 27-gauge Quincke needle. After free flow of cerebrospinal fluid was observed, a total volume of 1 ml spinal solution was administered to each patient over 30 seconds. Patients were turned to the prone position immediately after the block.

Primary outcome: Sensory and motor blockade:

a. Assessment of onset of Sensory Block: was assessed by a pin prick test Martland, et al. (2020) using a 3-point scale:

Grade 0: normal sensation.

Grade 1: decreased pain sensation to pinprick.

Grade 2: loss of pain sensation to pinprick.

The test was done every 5 minutes to loss of sensation happened and then surgical procedure started so sensation measured at zero and 5 min. Duration of sensory block was defined as the time interval between the success of the block and the complete resolution of anesthesia.

b. Assessment of onset of Motor block:

Motor block was assessed according to the Bromage scale (Sari et al., 2015).

Duration of motor block was defined as the time interval between the success of the block and the recovery of complete motor function of forearm and hand.

Secondary outcome:

The vital signs parameters including MAP, HR and SpO2 were recorded at base line, 5, 10, 15, 20 min. The assessment of postoperative pain was done with the help of Numeric Rating Scale (1-10). Zero was considered as no pain, 1-3 as mild pain, 4-6 as moderate pain and 7-10 as severe pain. At score of 4, rescue analgesic (inj. Diclofenac Sodium (1.5 mg/kg) intramuscularly) was given. Duration of analgesia will be the time from drug injection to the time of first rescue of analgesia during first 6 hours was recorded using VAS at 1, 2, 4, 6 hrs. postoperative.

Complications such as respiratory depression, nausea, vomiting and pruritus, and requests for pain relief during the early post-operative period were also noted.

Statistical Analysis:

Data were collected, revised, coded and entered to the Statistical Package for the Social Sciences (IBM SPSS) version 23. The quantitative data were presented as mean, standard deviations and ranges when parametric and median inter-quartile range (IQR) when data found non-parametric. Also qualitative variables were presented as number and percentages. The following tests were done: Independent- samples t-test of significance was used when comparing between two means. Chi-square (x2) test of significance was used in order to compare proportions between qualitative parameters. The confidence interval was set to 95% and the margin of error accepted was set to 5%. P-value <0.05 was considered significant.

RESULTS

There was no statistically significant difference found between group A and group B regarding age, gender, body mass index and total time of surgery with p-value = 0.693, 0.651, 0.486 and 0.340 respectively; while there was statistically significant difference found between the two studied groups regarding weight, height and ASA classification with p-value = 0.011, 0.008 and 0.006 respectively **(Table 1)**.

Table (1): Comparison between group A and group B regarding demographic data, anthropometric measures, ASA classification and total time of surgery

Variables \ Groups		Group A No. = 100	Group B No. = 100	P-value
Age	Mean ± SD	28.63 ± 4.11	28.4 ± 4.1	0.693
	Range	21 – 38	21 – 36	
Gender	Females	98 (98.0%)	97 (97.0%)	0.651
	Males	2 (2.0%)	3 (3.0%)	
Weight	Mean ± SD	73.31 ± 6.84	70.7 ± 7.46	0.011
	Range	60 – 90	60 – 90	
Height	Mean ± SD	171.07 ± 6.8	168.42 ± 7.15	0.008
	Range	158 – 188	157 – 188	
Body mass index (BMI)	Mean ± SD	25.05 ± 1.7	24.89 ± 1.54	0.486
	Range	22 – 28.7	22.5 – 29.4	
ASA	I	59 (59.0%)	77 (77.0%)	0.006
	II	41 (41.0%)	23 (23.0%)	
Total time of surgery	Mean ± SD	25.55 ± 3.25	25.95 ± 2.63	0.340
	Range	20 – 35	20 – 30	

There was significant increase in motor block intensity by Bromage score in group A than group B at (zero min) and at (5 min) with p-value < 0.001 and < 0.001 respectively and significant increase in sensory block in group A than group B at (zero min) with p-value = 0.001 while no incidence of pain found in the two studied groups at (5 min) **(Table 2)**.

Table (2): Comparison between group A and group B regarding motor block by Bromage score and sensory block by Pin Prick test score .

Parameters \ Groups		Group A No. = 100		Group B No. = 100		P-value
		No.	%	No.	%	
Motor block by Bromage score						
zero min (immediately after spinal)	1	21	21.0%	52	52.0%	<0.001
	2	79	79.0%	48	48.0%	
5 min	2	23	23.0%	80	80.0%	<0.001
	3	77	77.0%	20	20.0%	
Sensory block by Pin Prick test						
zero min (immediately after spinal)	Pain	42	42.0%	65	65.0%	< 0.001
	No pain	58	58.0%	35	35.0%	
5 min	Pain	0	0.0%	0	0.0%	1
	No pain	100	100.0%	100	100.0%	

There was no statistically significant difference found between group A and group B regarding use of intra-operative analgesia with p-value = 0.088 and significant difference found between the two studied groups regarding time of need of postoperative analgesia (hours) with p-value < 0.001 **(Table 3)**.

Table (3): Comparison between group A and group B regarding use of intra-operative analgesia and time of need of postoperative analgesia

Parameters \ Groups	Group A No. = 100	Group B No. = 100	P-value
Intra-operative analgesia			
No	83 (83.0%)	73 (73.0%)	0.088
Yes	17 (17.0%)	27 (27.0%)	
Postoperative need of analgesia (hrs)			
Mean ± SD	4.02 ± 0.56	2.48 ± 0.36	<0.001
Range	3.2 – 5	2 – 3	

There was statistically significant difference between the two groups regarding time of need of post-operative analgesia demand at 2 hrs, 4 hrs and 6 hrs with **(Table 4)**p-value < 0.001.

Table (4): Comparison between group A and group B regarding post operative pain measurement at 1, 2, 4, 6 hrs and time of need of postoperative analgesia

Time of Post. OPAnalgesia \ Groups	Group A No. = 100	Group B No. = 100	P-value
1 hr	0 (0.0%)	0 (0.0%)	<0.001
2 hrs	0 (0.0%)	48 (48.0%)	
4 hrs	32 (32.0%)	52 (52.0%)	
6 hrs	68 (68.0%)	0 (0.0%)	

Systolic blood pressure was found better in hemodynamic stability in group A than group B at baseline, immediately after spinal, (10 min), (15 min), (20 min), at end of surgery and at (1 hour) after operation with p-value <0.001, < 0.001, < 0.001, < 0.001, < 0.001 and <0.001 respectively while no statistically significant difference found between the two studied groups at (5 min) after induction with p-value = 0.140 **(Table 5)**.

Table (5): Comparison between group A and group B regarding systolic blood pressure at different times of measurement

SBP \ Groups		Group A No. = 100	Group B No. = 100	P-value
Baseline	Mean ± SD	129.41 ± 5.69	125.62 ± 8.48	<0.001
	Range	120 – 140	110 – 140	
Immediately after spinal	Mean ± SD	122.48 ± 4.71	114.7 ± 11.98	<0.001
	Range	114 – 132	85 – 130	
5 Min	Mean ± SD	114.42 ± 6.89	112.75 ± 8.91	0.140
	Range	95 – 125	90 – 128	
10 Min	Mean ± SD	117.66 ± 4.78	113.61 ± 5.42	<0.001
	Range	105 – 128	105 – 125	
15 Min	Mean ± SD	121.59 ± 4.16	114.72 ± 4.65	<0.001
	Range	112 – 130	105 – 125	
20 Min	Mean ± SD	123.25 ± 3.97	118.96 ± 4.36	<0.001
	Range	116 – 135	110 – 128	
End of surgery	Mean ± SD	127.51 ± 4.27	123.35 ± 6.71	<0.001
	Range	118 – 135	110 – 134	
1 hour after operation	Mean ± SD	125.53 ± 4.55	123.03 ± 6.52	<0.001
	Range	116 – 135	110 – 134	

There was no statistically significant difference found between group A and group B regarding diastolic blood pressure at baseline and immediately after spinal with p-value = 0.067 and 0.603 respectively. Also DBP was found better in hemodynamic stability in group B than group A at (5 min) after induction with p-value = 0.030, while at (10 min), (15 min), (20 min), at end of surgery and at (1 hour) after operation the diastolic blood pressure was found better in hemodynamic stability in group A than group B with p-value < 0.001, < 0.001, < 0.001, < 0.001 and < 0.001 respectively **(Table 6)**.

Table (6): Comparison between group A and group B regarding diastolic blood pressure at different times of measurement

DBP \ Groups		Group A No. = 100	Group B No. = 100	P-value
Baseline	Mean ± SD	80.09 ± 6.6	78.43 ± 6.16	0.067
	Range	69 – 90	68 – 90	
Immediately after spinal	Mean ± SD	72.97 ± 5.97	72.37 ± 9.87	0.603
	Range	60 – 84	50 – 88	
5 Min	Mean ± SD	68.82 ± 7.28	70.98 ± 6.67	<0.001
	Range	50 – 80	60 – 80	
10 Min	Mean ± SD	75.45 ± 4.19	71.56 ± 5.36	<0.001
	Range	68 – 82	60 – 82	
15 Min	Mean ± SD	79 ± 4.34	71.53 ± 4.83	<0.001
	Range	70 – 88	60 – 80	
20 Min	Mean ± SD	78.63 ± 4.62	73.3 ± 4.96	<0.001
	Range	70 – 90	60 – 80	
End of surgery	Mean ± SD	78.87 ± 4.28	75.85 ± 5.36	<0.001
	Range	70 – 90	66 – 88	
1 hour after operation	Mean ± SD	79 ± 4.34	71.53 ± 4.83	<0.001
	Range	70 – 88	60 – 80	

The mean arterial blood pressure was found better in hemodynamic stability in group A than group B at baseline, immediately after spinal, (10 min), (15 min), (20 min), at end of surgery and at (1 hour) after operation with p-value = 0.003, < 0.006, < 0.001, < 0.001, < 0.001 and < 0.001 respectively while no statistically significant difference found between the two studied groups at (5 min) after induction with p-value = 0.361 **(Table 7)**.

Table (7): Comparison between group A and group B regarding mean arterial blood pressure at different times of measurement

MABP \ Groups		Group A No. = 100	Group B No. = 100	P-value
Baseline	Mean ± SD	96.6 ± 4.98	94.38 ± 5.19	0.003
	Range	87 – 106	84 – 107	
Immediately after spinal	Mean ± SD	89.38 ± 4.52	86.46 ± 9.43	<0.006
	Range	80 – 97	62 – 102	
5 Min	Mean ± SD	84.14 ± 6.03	84.92 ± 6.01	0.361
	Range	70 – 93	70 – 95	
10 Min	Mean ± SD	89.52 ± 3.67	85.59 ± 3.37	<0.001
	Range	80 – 96	77 – 92	
15 Min	Mean ± SD	93.11 ± 3.54	85.88 ± 3.44	<0.001
	Range	84 – 100	78 – 92	
20 Min	Mean ± SD	93.5 ± 3.25	88.4 ± 3.54	<0.001
	Range	87 – 100	81 – 94	
End of surgery	Mean ± SD	95.11 ± 3.53	92.47 ± 4.28	<0.001
	Range	87 – 105	86 – 102	
1 hour after operation	Mean ± SD	93.11 ± 3.54	85.88 ± 3.44	<0.001
	Range	84 – 100	78 – 92	

There was no statistically significant difference found between group A and group B regarding SaO2 at different times of measurement **(Table 8)**.

Table (8): Comparison between group A and group B regarding SaO2 at different times of measurement

SaO2 \ Groups		Group A No. = 100	Group B No. = 100	P-value
Baseline	Mean ± SD	99.16 ± 0.93	99.17 ± 0.75	0.933
	Range	97 – 100	98 – 100	
Immediately after spinal	Mean ± SD	99.07 ± 0.77	98.88 ± 0.82	0.093
	Range	98 – 100	97 – 100	
5 Min	Mean ± SD	98.92 ± 0.66	98.9 ± 0.67	0.833
	Range	98 – 100	98 – 100	
10 Min	Mean ± SD	98.95 ± 0.80	99.13 ± 0.84	0.121
	Range	97 – 100	97 – 100	
15 Min	Mean ± SD	98.99 ± 0.73	98.86 ± 0.65	0.186
	Range	98 – 100	98 – 100	
20 Min	Mean ± SD	98.87 ± 0.81	98.93 ± 0.66	0.566
	Range	98 – 100	98 – 100	
End of surgery	Mean ± SD	98.77 ± 0.74	98.92 ± 0.71	0.143
	Range	98 – 100	98 – 100	
1 hour after operation	Mean ± SD	99 ± 0.64	99.01 ± 0.64	0.912
	Range	98 – 100	98 – 100	

There was no statistically significant difference found between group A and group B regarding heart rate at different times of measurement except immediately after spinal and at end of surgery the heart rate was found better in group A than group B with p-value < 0.001 and < 0.001 respectively **(Table 9)**.

Table (9): Comparison between group A and group B regarding heart rate at different times of measurement

Heart Rate \ Groups		Group A No. = 100	Group B No. = 100	P-value
Baseline	Mean ± SD	84.71 ± 5.63	84.33 ± 7.06	0.674
	Range	70 – 97	70 – 98	
Immediately after spinal	Mean ± SD	85.69 ± 8.25	79.29 ± 15.84	<0.001
	Range	60 – 97	45 – 98	
5 Min	Mean ± SD	84.1 ± 10.31	83.62 ± 16.3	0.804
	Range	48 – 97	44 – 115	
10 Min	Mean ± SD	87.62 ± 7.96	89.06 ± 11.31	0.299
	Range	70 – 110	70 – 120	
15 Min	Mean ± SD	86.3 ± 6.21	86.52 ± 7.43	0.821
	Range	70 – 97	70 – 105	
20 Min	Mean ± SD	85.67 ± 5.77	86.8 ± 6.22	0.185
	Range	70 – 97	70 – 97	
End of surgery	Mean ± SD	86.99 ± 5.56	83.01 ± 6.53	<0.001
	Range	75 – 97	70 – 94	
1 hour after operation	Mean ± SD	85.67 ± 5.77	86.8 ± 6.22	0.185
	Range	70 – 97	70 – 97	

That there was no incidence of respiratory depression and ECG changes was found in both groups; also the table shows that the incidence of pruritits was found higher in group A than group B with p-value < 0.001; also the incidence of nausea and vomiting was found higher in group B than group A with p-value = 0.004 and < 0.001 respectively **(Table 10)**.

Table (10): Comparison between group A and group B regarding complications of spinal anesthesia

Complications \ Groups		Group A No. = 100	Group B No. = 100	P-value
Respiratory depression	No	100 (100.0%)	100 (100.0%)	1
	Yes	0 (0.0%)	0 (0.0%)	
ECG changes	No	100 (100.0%)	100 (100.0%)	1
	Yes	0 (0.0%)	0 (0.0%)	
Pruritis	No	73 (73.0%)	92 (92.0%)	<0.001
	Yes	27 (27.0%)	8 (8.0%)	
Nausea	No	92 (92.0%)	77 (77.0%)	0.004
	Yes	8 (8.0%)	23 (23.0%)	
Vomiting	No	100 (100.0%)	87 (87.0%)	<0.001
	Yes	0 (0.0%)	13 (13.0%)	

DISCUSSION

The results of the present study indicated that for out-patient anorectal surgery, intrathecal administration of (25 µg) fentanyl combined with an ultra-low dose of bupivacaine provides good-quality spinal anesthesia and reduces the need for early post-operative analgesic supplementation. Furthermore, this protocol was well suited for the out-patient setting because it is associated with rapid recovery of full motor power, sensory function and less side effects. This suggests a potential synergism between fentanyl and bupivacaine.

The intrathecal administration of opioids selectively decreases nociceptive afferent input from Aδ and C fibers without affecting dorsal root axons or somatosensory evoked potentials *(Gurbet et al., 2018)*.

Lipophilic opioids, such as fentanyl, have a favorable clinical profile with fast onset, modest duration (1 – 4 h) and little risk of delayed respiratory depression *(Mehta, 2020)*.

The recommended safe effective dose of intrathecal fentanyl is (10 – 25 µg). Numerous clinical studies have demonstrated that intrathecal fentanyl does not prolong the duration of motor blockade *(Gupta et al., 2013)*.

In an attempt to modify anesthesia for ambulatory surgery, several investigators have evaluated intrathecal fentanyl in combination with smaller doses of spinal local anesthetic. In a randomized, double-blind study involving gynecological laparoscopy *Kendall et al. (2018)*.

They found improved intraoperative analgesia and prolonged sensory block, but no difference in motor recovery or time to discharge, in the (25 µg) fentanyl group compared with the (0) and (10 µg) fentanyl groups *Bindra et al. (2018)*.

In addition, *Park et al. (2019)* found increased duration of sensory block without prolonged motor blockade or recovery for ambulatory discharge with (10 µg) fentanyl added to low dose (5 mg) hyperbaric bupivacaine for knee arthroscopy.

All these findings are consistent with the present results that (25 µg) fentanyl added to ultra-low dose (2.5 mg) intrathecal bupivacaine neither increased the intensity of motor block nor prolonged the discharge time for anorectal surgery in the ambulatory setting.

In contrast to our findings, *Gurbet et al. (2018)* found significantly increased duration of sensory block with (10 µg) intrathecal fentanyl added to 3 ml 0.17% bupivacaine. This might be explained by protocol differences since the present study used ultra-low dose (2.5 mg) intrathecal bupivacaine with (25 µg) intrathecal fentanyl.

Comparing different doses of fentanyl (7.5, 10 and 12.5 µg) added to a fixed dose (5 mg, 0.17%) of bupivacaine, *Bhavya (2013)* found that 12.5 µg fentanyl provided better surgical anaesthesia and increased reliability of the block in minor urological procedures than (7.5) or (10 µg) fentanyl.

As the spinal bupivacaine dose in the present study is lower than in that of *Bhavya (2013)* (25 µg) fentanyl was used to provide longer sensory anesthesia without increasing discharge duration. The most consistent side-effect in the

present study was pruritus in patients receiving intrathecal fentanyl, although in most cases it was mild and did not require treatment.

In other studies the side-effects of intrathecal fentanyl have been shown to be dose-related *Ver Donck et al. (2014)*. Respiratory depression is a known complication of spinal opioids *Orlov et al. (2013)*. This may be problematic with higher doses, as reported in a volunteer study *Dahan et al. (2016)*.

In the present study, there were no clinical manifestations of respiratory depression with a fentanyl dose of (25 µg). Additionally, *Kumar et al. (2011)* reported that 25 µg intrathecal fentanyl in elderly patients did not lead to respiratory depression.

In the present study it was found that (25 µg) intrathecal fentanyl reduced the analgesic requirement without increasing episodes of nausea or vomiting *Pöpping et al. (2012)*. These findings were comparable with those of *Zode and Dhumane (2015)* who used (25 µg) intrathecal fentanyl for lower extremity or genitourinary surgery, and *Lee et al. (2011)* who used (0.5 or 0.75 µg/kg) intrathecal fentanyl for cesarean delivery.

CONCLUSION

Addition of (25 µg) fentanyl to (2.5 mg) 0.5% bupivacaine prolong the duration of sensory spinal block and reduced the analgesic requirement during the early post-operative period without increasing the incidence of opioid-related side-effects, except pruritus, or delaying hospital discharge in patients undergoing ambulatory anorectal surgery in comparison to using (5 mg) 0.5% bupivacaine alone.

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دراسة تأثير مزج جرعات فائقة الصغر من البيوبيفاكين مع الفنتانيل للتخدير النصفي في جراحات الشرج لليوم الواحد

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خلفية البحث: تعتبر جراحات الشرج البسيطة مثل الشرخ والبواسير من المشاكل الشائعة وتحتاج في بعض الحالات لإجراء تدخل جراحي, ويعتبر التخدير النصفي هو الإختيار الأمثل لمثل هذه الحالات.

الهدف من الدراسة: مقارنة تأثير إضافة الفنتانيل إلي جرعات فائقة الصغر من البيوبيفاكين في التخدير النصفي لعمليات جراحات الشرج البسيطة.

المرضي وطريقه البحث: تم اختيار المرضي بصورة عشوائية في مجموعتين متساويتين:

المجموعة (A): أعطي المرضي جرعة (2.5) ملغم من البيوبيفاكين بتركيز 0.5 % مع (25) ميكروجرام من الفنتانيل.

المجموعة (B): أعطي المرضي جرعة (5ملغم) من البيوبيفاكين بتركيز 0.5 % فقط.

تم تقييم المرضى وفقا لمعيار بروميج ومعيار مقياس التصنيف الرقمي وفقا لطلب المريض لأول مرة الحصول علي مسكن خلال 6 ساعات بعد العملية الجراحية. وقد تم تقييم جميع المرضى فيما يتعلق بمعدل ضربات القلب وضغط الدم و نسبه تشبع الدم بالأكسجين ووقت طلب المريض للمسكن لأول مرة والآثار الجانبية للادوية ومستوي رضا المريض.

النتائج: ضغط الدم ومعدل ضربات القلب ومعدل التنفس أكثر استقرارًا في المجموعة الأولي (مجموعة الفنتانيل والبيوبيفاكين) عن المجموعة الثانية

(مجموعة البيوبيفاكين فقط) اثناء الجرحة و بعدها. وفيما يتعلق بدرجة تسكين الالم، فقد أظهر أن المرضى في مجموعة الفنتانيل والبيوبيفاكين تم تسكينهم لمدة أطول بعد العمليات الجراحية مقارنة بمجموعة البيوبيفاكين فقط. اظهرت الدراسة أن استخدام الفنتانيل يقلل من الألم بعد العملية الجراحية واستهلاك المسكن في أول 6 ساعات بعد الجراحة مع فترة أطول خالية من الألم مقارنة بالمرضى الذين تلقوا بيوبيفاكين فقط.

الاستنتاج: إضافة (25) ميكروجرام من الفنتانيل الي (2.5) ملغم من البيوبيفاكين قد سكن المرضي لمدة أطول وحافظ علي العلامات الحيوية لتكون أكثر ثباتا, وقلل فترة الاقامة بالمستشفي من استخدام (5) ملغم من البيوبيفاكين فقط دون حدوث آثار جانبية باستثناء الهرش الذي اشتكي منه بعض المرضي.

الكلمات الدالة: فنتانيل, بيوبيفاكين, جراحات الشرج.