ECRONICON OPEN ACCESS

EC ANAESTHESIA
Research Article

Subarachnoid Analgesic Modalities Fentanyl-Bupivacaine and Bupivacaine in Surgical Interventions of Inferior Hemiabdomen

Karell Piñón García[1], Mirelys Valladares Díaz[2], Mayda Correa Borrell[3], José Antonio Pozo Romero[4] and Carlos de la Paz Estrada[5]*

[1]Especialista de Primer Grado en Anestesiología y Reanimación, Profesor Instructor, Hospital Universitario Manuel Ascunce Domenech, Camagüey, Cuba

[2]Especialista de Primer Grado en Anestesiología y Reanimación, Hospital Universitario Manuel Ascunce Domenech, Camagüey, Cuba

[3]Especialista de Segundo Grado en Anestesiología y Reanimación, Máster en Urgencias Médicas, Investigadora Auxiliar, Profesor Auxiliary Consultante, Hospital Universitario Manuel Ascunce Domenech, Camagüey, Cuba

[4]Especialista de Segundo Grado en Anestesiología y Reanimación, Máster en Urgencias Médicas, Profesor Asistente, Hospital Universitario Manuel Ascunce Domenech, Camagüey, Cuba

[5]Especialista de Segundo Grado en Anestesiología y Reanimación, Máster en Urgencias Médicas, Profesor Asistente, Hospital Pediátrico Provincial "Ignacio Agramonte Piña", Camagüey, Cuba

***Corresponding Author:** Carlos de la Paz Estrada, Especialista de Segundo Grado en Anestesiología y Reanimación, Máster en Urgencias Médicas, Profesor Asistente, Hospital Pediátrico Provincial "Ignacio Agramonte Piña", Camagüey, Cuba.

Received: April 23, 2019; **Published:** May 29, 2019

Abstract

Objectives: Eto value the subarachnoid analgesic modalities fentanyl-bupivacaine and bupivacaine in surgical interventions of the inferior hemiabdomen.

Material and Methods: A prospective longitudinal analytical Study was carried out at the university Hospital "Manuel Ascunce Domenech" since January 2015 to December 2017. The universe was composed of 180 patients. A sample of 60 patients was selected using simple random probabilistic sampling distributed in two groups: A (Fentanyl-bupivacaine) and B (Bupivacaine) that met the inclusion criteria. The data were collected in the form on the basis of the investigation that allowed the preparation of a database in statistical package for social sciences. They were used in the analysis of univariate and multivariate techniques.

Results: The complications and adverse reactions and their probability of presentation in the group fentanyl-bupivacaine, which was higher, were drowsiness (3.5 times), arterial hypotension (2.8 times), pruritus (2.1 times), and Bradycardia (2.1 times), corroborated by the confidence interval. This group was 10 times more likely to have tolerable discomfort or no pain (OR = 10.2) than those treated with bupivacaine that presented moderate pain; 10 times more chance of analgesia greater than three hours (or = 10.7) versus bupivacaine with analgesia of thirty minutes to three hours and 8 times more likely to receive good satisfaction (or = 7.8).

Conclusions: The evaluation of the Postoperative pain and analgesia time were better in patients treated with fentanyl-bupivacaine which resulted in higher quality analgesia but predominated drowsiness, arterial hypotension, pruritus and bradycardia as adverse reactions.

Keywords: *Postoperative Pain; Analgesia; Satisfaction; Adverse Reactions*

Introduction

Postoperative pain, also considered a key vital sign, is a variant of acute pain; It is one of the worst treaties, being able to last hours or days, produces anxiety and anguish. It is produced by a hyperstimulation of the nociceptive pathways.

Postoperative pain control indicates the quality of health care provided to a patient. It is necessary to use strategies to assess their intensity and evaluate the quality of the treatment received [1,2] and the protocols for their treatment are advancing significantly today. However, it is reported that the prevalence of moderate to severe pain after surgical interventions is around 26.0% to 33.0% and severe pain between 8.0% and 13.0% [3].

Inadequate pain control leads to a persistent and disabling nociceptive phenomenon that causes suffering and dissatisfaction in patients and brings complications. The appropriate treatment is considered a relevant indicator of good clinical practice and a high quality of care. The current evidence shows that the correct control of acute postoperative pain facilitates recovery, which reduces hospital stay time, costs and also decreases the morbidity and mortality associated with care in a healthcare center [4,5]. The decrease in postoperative pain is the cornerstone of an appropriate evolution.

There is a wide variety of medications useful for the treatment and control of postoperative pain. The most practical recommendation is the Association of two analgesics with different mechanisms of action, which achieves a greater analgesia and also reduces the undesirable effects associated with the doses of some of the drugs [6,7].

The combination of fentanyl (potent narcotic analgesic of immediate action and short half-life) and bupivacaine, (local anesthetic with longer latency, 20 minutes, and longer duration between 3 and 9 hours) [8,9], takes advantage of the analgesic qualities of each one, Ideal for transoperative the first and guarantee of postoperative analgesia the second, opioids are effective in the treatment of visceral pain and local anesthetics for the relief of somatic pain. The bupivacaine when combined with fentanyl at low doses, provides an analgesia of 90 minutes and in turn decreases the latency period of the bupivacaine with less frequent adverse reactions [10,11].

However, a large part of these patients are still treated inappropriately, so they experience unjustified suffering that increases the risk of postoperative complications [12-14] which motivates the realization of this study that aims to determine in two groups of patients postoperative complications, the evaluation of postoperative pain, the duration of analgesia and the satisfaction perceived by the patient with the modality of analgesia used as a contribution to analgesia During the postoperative, to achieve comfort and decreased complications in surgical patients.

Material and Methods

The research constituted a prospective, longitudinal, analytical study with the objective of evaluating the subarachnoid analgesic modalities fentanyl-bupivacaine and bupivacaine in surgical interventions of the inferior hemiabdomen in the Hospital. University "Manuel Ascunce Domenech" from January 2015 to December 2017. The universe was composed of 180 patients. A sample of 60 patients distributed in two groups (A and B) with different therapeutic modalities and met the inclusion criteria were selected by simple random probabilistic sampling. Group membership was randomly determined. The sample size was calculated with a safety level of 95%, precision of 3%, proportion of 5% and expected proportion of losses of 15%.

The therapeutic modalities were

- Group A: bupivacaine 0.5% hyperbaric 12.5 mg more fentanyl 25 mcg.
- Group B: bupivacaine 0.5% hyperbaric 15 mg.

Statistical proportions contrast techniques were applied using X^2 with a reliability level of 95%. The determination of Odds ratio, confidence interval and statistical significance was employed.

Results

Table 1 exposes the complications and adverse reactions encountered by groups, and the probability of presentation of them and were given by drowsiness, arterial hypotension, pruritus, and bradycardia. In this way it was observed: it is 3.5 times more likely that the patient of the group A who was given fentanyl-bupivacaine have drowsiness in relation to the patients of group B who were administered

bupivacaine corroborated by the confidence interval 2,287 - 5,687. It is 2.8 times more likely that the patient of group A has arterial hypotension in relation to the patients of group B corroborated by the confidence interval 2,275 - 4,395. It is 2.1 times more likely that the patient of group A has pruritus in relation to the patients of group B corroborated by the confidence interval 2,745 - 5,245. It is 2.1 times more likely that the patient of group A has bradycardia in relation to the patients of group B corroborated by the confidence interval 2,895 - 7,271.

Complications	Group A		Group B		Total		OR (A/B)	IC95%	To
	Nº	%	Nº	%	Nº	%			
Drowsiness	6	10,0	2	3,3	8	13,3	3,500	2,287 - 5,687	8, 50E-10
Nausea and vomiting	2	3,3	5	8,3	7	11,7	0,357	0,124 - 1,324	2, 36E-01
Hypotension	5	8,3	2	3,3	7	11,7	2,800	2,275 - 4,395	2, 36E-10
Itching	4	6,7	2	3,3	6	10,0	2,154	2,745 - 5,245	6, 19E-11
Bradycardia	4	6,7	2	3,3	6	10,0	2,154	2,895 - 7,271	6, 19E-11
Hypertension	1	1,7	2	3,3	3	5,0	0,483	0,247 - 1,112	8, 44E-02

Table 1: *Complications and adverse effects encountered by groups.*

Source: Medical history.

Patients treated with fentanyl-bupivacaine were approximately 10 times more likely to have tolerable discomfort or no pain than those treated with bupivacaine (OR = 10.2) who referred to moderate pain as shown in table 2 on Pain assessment.

Pain Assessment	Group A		Group B		Total	
	Nº	%	Nº	%	Nº	%
No pain	6*	10,0	2	3,3	8	13,3
Tolerable annoyance	21*	35,0	12	20,0	33	55,0
Moderate pain	2	3,3	14	23,3	16	26,7
Intense pain	1	1,7	2	3,3	3	5,0
Total	30	50,0	30	50,0	60	100
OR = 10.286 IC95% = 5,924 - 19,745 sig = 1, 03E-43						

Table 2: *Pain assessment.*

Source: Medical history.

Table 3 referred to the time duration of analgesia showed patients treated with fentanyl-bupivacaine were 10 times more likely to have analgesia of more than three hours than those treated with bupivacaine (OR = 10.7) that had Analgesia 30 minutes to 3 hours.

Duration time of analgesia	Group A		Group B		Total	
	Nº	%	Nº	%	Nº	%
Less than 30 minutes	2	3,3	3	5,0	5	8,3
30 minutes-3 hours	5	8,3	16	26,7	21	35,0
More than three hours	23*	38,3	7	11,7	30	50,0
Total	30	50,0	26	43,3	56	93
OR = 10,796 IC95% = 3,792-22,274 sig = 4, 965E-12						

Table 3: *Analgesia duration time.*

Source: Medical history.

The perceived satisfaction with postoperative analgesia appears in table 4 where patients treated with fentanyl-bupivacaine were approximately eight times more likely to have good perceived satisfaction than those treated with Bupivacaine (OR = 7.8).

Perceived satisfaction	Group A		Group B		Total	
	Nº	%	Nº	%	Nº	%
Good	27*	45,0	16	26,7	43	71,7
Regular	2	3,3	12	20,0	14	23,3
Bad	1	1,7	2	3,3	3	5,0
Total	30	50,0	30	50,0	60	100
OR = 7,875 IC95% = 2,854-18,487 sig = 1, 01E-43						

Table 4: *Perceived satisfaction with postoperative analgesia.*

Source: Medical history.

Discussion

The complications and adverse reactions in this research coincide with the report of Fernández Ramos., *et al.* [15] in his study on fentanyl intradural in elderly people, when he points out drowsiness and bradycardia was found in his study groups in 55 and 46 patients respectively, and in several of them, pruritus and hypotension were observed. These authors point out that in no patient were serious complications such as respiratory depression and urine retention, and the effects occurred as the dose of opiate increased. There was no pruritus in the group of patients in whom fentanyl was not employed, however almost all of the patients in whom high doses were applied showed this effect.

There was correspondence with other authors. Miyoshi., *et al.* [16] report the complications and adverse reactions in his series of patients treated with fentanyl were nausea (25.3%), drowsiness (41.7%) and constipation (8.3%).

Singa., *et al.* [17] they point out that in the treatment with fentanyl of pain above 4 in the EVA, drowsiness may appear from 30 - 50%. Kang., *et al.* [18] report that drowsiness can be prevented by lowering the dose of medication. Unlu [19] demonstrates in his research that opioid treatment does not affect the cognitive process despite the fact that it can or will sleep in some patients. Li., *et al.* [20] they report few adverse reactions in their series of patients treated with the combination of fentanyl and bupivacaine.

González Pérez., *et al.* [21] report a study compared between bupivacaine and bupivacaine-fentanyl in surgery for hip fracture in elderly and obtains greater hemodynamic stability in the group of fentanyl with a greater number of episodes Hypotensive in the Bupivacaine, without Coincide with our results in which the group fentanyl-bupivacaine presented greater probability of arterial hypotension and bradycardia since most opioids decrease the sympathetic tone and increase the vagal tone [22].

Part of the analgesic effect of opiates is done through the activation of serotonergic neurons. It has been observed that fentanyl causes a regulation to the high dose dependent on receptors 5-HT1A at the level of hippocampus and rat brain amygdala. It is pointed out in the literature that the stimulation of the receptors 5-HT1A presents analgesic effect at the central level [23-25]. These approaches coincide with our results in which patients with fentanyl-Bupivacaine Association presented lower postoperative pain and increased analgesia time.

The Association of Greater time and quality of postoperative analgesia results in a greater subjective satisfaction on the part of the patient, who is benefited by the application of increasingly effective therapeutic schemes, as was demonstrated in the study, Coincident with Hefni., *et al.* [26], Graudins., *et al.* [27] and Adamou., *et al.* [28] which indicate subjective satisfaction in patients treated with opioids for the control of pain.

Conclusion

We conclude that La fentanyl-bupivacaine association resulted in higher quality analgesia than bupivacaine in lower hemiabdomen interventions with better results in relation to analgesia time and postoperative pain assessment. As well as in the presence of complications and adverse reactions was higher in the group fentanyl-bupivacaine with predominance of drowsiness, arterial hypotension, pruritus and bradycardia.

Bibliography

1. White PF., *et al*. "Does small-dose fentanyl improve perioperative outcomes in the ambulatory setting? A randomized, double-blind, placebo-controlled study". *Acta Anaesthesiologica Scandinavica* 59.1 (2015): 56-64.

2. Takigawa C., *et al*. "Breakthrough pain management using fentanyl buccal tablet (fbt) in combination with around-the-clock (atc) opioids based on the efficacy and safety of fbt, and its relationship with atc opioids: results from an open-label, multi-center study in japanese cancer patients with detailed evaluation". *Japanese Journal of Clinical Oncology* 45.1 (2015): 67-74.

3. Yoshida K., *et al*. "Prediction formulas for individual opioid analgesic requirements based on genetic polymorphism analyses". *Plos One* 10.1 (2015): e0116885.

4. Yang CH., *et al*. "Sedation and analgesia with fentanyl and etomidate for intrathecal injection in childhood leukemia patients". *Medicine (Baltimore)* 94.1 (2015): e361.

5. Xing SZ and Zhang Y. "Efficacy and safety of transdermal fentanyl for the treatment of oral mucositis pain caused by chemoradiotherapy in patients with esophageal squamous cell carcinoma". *Support Care Cancer* 23.3 (2015): 753-759.

6. Sviggum HP., *et al*. "The effect of bupivacaine with fentanyl temperature on initiation and maintenance of labor epidural analgesia: a randomized controlled study". *International Journal of Obstetric Anesthesia* 24.1 (2015): 15-21.

7. Robleda G., *et al*. "A randomized controlled trial of fentanyl in the pre-emptive treatment of pain associated with turning in patients under mechanical ventilation: research protocol". *Journal of Advanced Nursing* 71.2 (2015): 441-450.

8. Craig MG., *et al*. "A Randomized Control Trial of Bupivacaine and Fentanyl versus Fentanyl-only for Epidural Analgesia during the Second Stage of Labor". *Anesthesiology* 122.1 (2015): 172-177.

9. Chen CC., *et al*. "Acupuncture for pain relief after total knee arthroplasty: a randomized controlled trial". *Regional Anesthesia and Pain Medicine* 40.1 (2015): 31-36.

10. Bouattour K., *et al*. "[Epidural bleeding after labor epidural analgesia]". *Annales Françaises d'Anesthésie et de Réanimation* 33.12 (2014): 690-692.

11. Junior Ade P., *et al*. "[Comparison between continuous thoracic epidural and paravertebral blocks for postoperative analgesia in patients undergoing thoracotomy: systematic review]". *Revista Brasileira de Anestesiologia* 63.5 (2013): 433-442.

12. Holler JP., *et al*. "Peridural analgesia may affect long-term survival in patients with colorectal cancer after surgery (PACO-RAS-Study): an analysis of a cancer registry". *Annals of Surgery* 258.6 (2013): 989-993.

13. Erkin Y., *et al*. "[A new technique for long time catheterization of sacral epidural canal in rabbits]". *Revista Brasileira de Anestesiologia* 63.5 (2013): 385-388.

14. Di Minno MN., *et al*. "Ropivacaine infusion in diabetics subject with peripheral arterial disease. A prospective study". *Experimental and Clinical Endocrinology and Diabetes* 121.2 (2013): 91-93.

15. Fernandez Ramos H., *et al*. "Intradural dose behavior of fentanyl in the geriatric patient". *La Revista Cubana De Anestesiología Y Reanimación* 8.1 (2009): 726-732.

16. Miyoshi T., *et al*. "[Efficacy and safety of transdermal fentanyl patches for opioid initiation in patients with gastrointestinal obstruction]". *Gan to Kagaku Ryoho* 41.11 (2014): 1401-1405.

17. Singla NK., *et al*. "A dose-finding study of sufentanil sublingual microtablets for the management of postoperative bunionectomy pain". *The Journal of Trauma and Acute Care Surgery* 77.3 (2014): S198-S203.

18. Kang JH., *et al*. "The efficacy of low-dose transdermal fentanyl in opioid-naive cancer patients with moderate-to-severe pain". *Korean Journal of Internal Medicine* 30.1 (2015): 88-95.

19. Unlu N., *et al*. "[The cognitive effects of using transdermal fentanyl in cancer pain]". *Agri* 26.3 (2014): 126-130.

20. Li B., *et al*. "Bupivacaine in Combination with Fentanyl or Sufentanil in Epidural/Intrathecal Analgesia for Labor: A Meta-analysis". *Journal of Clinical Pharmacology* 55.5 (2014): 584-591.

21. González Pérez E., *et al*. "Quality in spinal anaesthesia with Bupivacaine plus fentanyl for patients with intertrocantérica hip fracture". *La Revista Cubana De Anestesiología Y Reanimación* 8.2 (2009): 128-147.

22. Navarrete Zuazo VM. "Intravenous anesthesia". In: Dávila Cabo de Villa E. Clinical Anesthesiology. Havana. Medical sciences (2014): 99-138.

23. Timerbaev VH., *et al*. "[Assessment of pain relief in patients receiving different variants of multimodal analgesia after major gynecological surgery]". *Anesteziologiia i Reanimatologiia* 2 (2014): 32-37.

24. Barann M., *et al*. "Effects of opioids on human serotonin transporters". *Naunyn-Schmiedeberg's Archives of Pharmacology* 388.1 (2015): 43-49.

25. Hillman AD., *et al*. "Serotonin syndrome caused by fentanyl and methadone in a burn injury". *Pharmacotherapy* 35.1 (2015): 112-117.

26. Hefni AF., *et al*. "Epidural dexamethasone for post-operative analgesia in patients undergoing abdominal hysterectomy: A dose ranging and safety evaluation study". *Saudi Journal of Anaesthesia* 8.3 (2014): 323-327.

27. Graudins A., *et al*. "The PICHFORK (Pain in Children Fentanyl or Ketamine) Trial: A Randomized Controlled Trial Comparing Intranasal Ketamine and Fentanyl for the Relief of Moderate to Severe Pain in Children With Limb Injuries". *Annals of Emergency Medicine* 65.3 (2014): 248-254.

28. Adamou N., *et al*. "A randomised controlled trial of opioid only versus combined opioid and non-steroidal anti inflammatory analgesics for pain relief in the first 48 hours after Caesarean section". *Nigerian Medical Journal* 55.5 (2014): 369-373.

Volume 5 Issue 6 June 2019