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Morphine - bupivacaine and bupivacaine in gynecological surgeries

Abstract

Objective: Evaluate the intrathecal use of morphine-bupivacaine and bupivacaine in gynecological surgeries.

Material and methods: An analytic longitudinal prospective study was perfomed at the Manuel Piti Fajardo Hospital in Florida, from February 2019 to March 2020. The universe was compound by 180 patients. Sample was select about 60 patients by probabilistic simple randon sampling distributed in two groups: A (Morphine -Bupivacaine) and B (Bupivacaine) according to inclusion criteria. The data were collected in questionnaire properly to investigation with baseline data in Statistical Package for Social Sciences. A univariate and multivariate analysis were conducted.

Results: Complications and adverse reactions and their probability of presentation in the morphine=bupivacaine group was greater, pruritus (3.5 times), nausea and vomiting (2.8 times), hypotension (2.1 times) and urinary retention (2.1 times) corroborated by confidence intervals.This group had ten times more probability to have tolerable trouble or no pain (QR=10,2) that bupivacaine group, all of which showed moderate to several pain;10 times more probability of analgesia greater to 24 hours (QR=10,7) compared to bupivacaine and 8 times more likely to perceive good satisfaction.

Conclusions: Evaluation of pain postoperative and analgesic time were better in patients managed with morphine =bupivacaine that resulted in analgesic of the greatest quality although prevailed pruritus, nausea and vomiting, hypotension and urinary retention like adverse reactions.

Keywords: postoperative pain, analgesia, satisfaction, adverse reactions

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Introduction

Postoperative pain control is indicative of the quality of care provided to a patient, and strategies for its management are advancing significantly today.[1–3] Current evidence shows that adequate control of acute postoperative pain facilitates recovery, which reduces the length of hospital stay, costs and also reduces morbidity and mortality associated with care in a health care center.[4–6]

Pain, also considered a key vital sign, requires the use of strategies to assess its intensity and evaluate the quality of the treatment received, especially through the use of the so-called horizontal Visual Analog Scale (VAS), which allows a subjective measurement of the intensity of pain manifested by each patient.[7–9] There is a wide variety of useful drugs for the treatment and control of postoperative pain, headed by opioids, analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), local anesthetics and even devices that regulate their administration. The most practical recommendation is the association of two analgesics with different mechanisms of action, which achieves greater analgesia and also reduces the undesirable effects associated with the doses of some of the drugs.[10–12] The combination of Morphine (potent miu opioid receptor agonist) and Bupivacaine (local anesthetic with longer latency and longer duration), takes advantage of the analgesic qualities of each one. In understanding for the combination of opioids and local anesthetics, is that these two types of drugs eliminate pain by acting at two distinct sites, the local anesthetic at the nerve axon and the opioid at the receptor site in the spinal cord.

Since their introduction into clinical practice in 1979, spinal opioids have achieved international popularity. Both as single analgesic agents and in combination with low doses of local anesthetics.[14] Numerous studies have shown that opioids can provide profound postoperative analgesia with fewer systemic and central adverse effects.[15]

Morphine was the first intrathecal opioid available and continues to be the most widely used drug worldwide, usually injected before the surgical procedure. In recent European Union studies, the most commonly used opioid for postoperative pain control is morphine.[16] Intrathecal opioids have become a considerable contribution to postoperative analgesia and are frequently used as part of a mixed anesthetic technique.[17]

Inadequate pain control leads to a persistent and disabling nociceptive phenomenon, which causes suffering and dissatisfaction in patients and results in complications. Adequate treatment is considered a relevant indicator of good clinical practice and high quality of care. Current evidence shows that the correct control of acute postoperative pain facilitates recovery, which reduces the length of hospital stay, costs and also reduces morbidity and mortality associated with care in a health care center.[18,19] Therefore, the reduction of postoperative pain is the cornerstone of an adequate evolution.

However, a large number of these patients continue to be treated inadequately, thus experiencing unjustified suffering that increases the risk of postoperative complications,[20] which motivates this study, which aims to determine postoperative complications in two groups, the duration of analgesia and the patient's perceived satisfaction with the analgesia used during the postoperative period to achieve comfort and reduce complications in surgical patients.

Material and methods

The research constituted a prospective longitudinal and analytical study, with the objective of evaluating the intrathecal use of Morphine-Bupivacaine and Bupivacaine in gynecological surgeries at the Manuel Piti Fajardo Municipal Hospital in Florida from February 2019 to March 2020. The universe was composed of 180 patients.

A sample of 60 patients distributed in two groups (A and B) with different therapeutic modalities and who met the inclusion criteria was selected by simple random probability sampling. Group membership was randomly determined. The sample size was calculated with a confidence level of 95 %, precision of 3 %, proportion of 5 % and expected proportion of losses of 15 %.

Inclusion criteria

Age between 18 and 55 years old

Classification I and II according to the American Society of Anesthesiologists.

Exclusion criteria

Contraindications for spinal anesthesia. The therapeutic modalities were:

Group A: Bupivacaine 0.5% 15 mg plus Morphine 0.2 mg.

Group B: Bupivacaine 0.5% 15 mg.

Statistical techniques were applied to contrast proportions by means of X^2 with a reliability level of 95 %. The determination of odds ratio, confidence interval and statistical significance was used.

Results

Table 1 shows the complications and adverse reactions found by group, as well as the probability of their occurrence. Thus, it was observed that it is 3.5 times more likely that the patient in group A (to whom morphine-bupivacaine was administered) will have pruritus in relation to the patients in group B (to whom bupivacaine was administered), as corroborated by the confidence interval 2.287-5.687. The patient in group A is 2.8 times more likely to have nausea and vomiting (corroborated by the confidence interval 2.275-4.395). It is 2.1 times more likely that those in group A will have hypotension (confidence interval 2.745-5.245). Patients in group A are 2.1 times more likely to have urinary retention than patients in group B (confidence interval 2.895-7.271).

Table 1 Complications and adverse effects found by group. Source: Medical History

Complications	Group A		Group B		Total	OR	95%CI	sig
	NO.	%	NO.	%	NO.%	(A/B)		
Pruritus		10,0	3,3		13,3	3,500	2,287-5,687	8,50E-10
drowsiness	5	8,3	3,3		11,7	0,357	0,124-1,324	2,36E-01
Nausea and vomiting	5	8,3	3,3		11,7	2,800	2,275-4,395	2,36E-10
hypotension		6,7	3,3		10,0	2,154	2,745-5,245	6,19E-11
Urinary retention		6,7	3,3		10,0	2,154	2,895-7,271	6,19E-11
Hypertension	1	1,7	3,3		5,0	0,483	0,247-1,112	8,44E-02

Subjects treated with morphine-bupivacaine were approximately 10 times more likely to have tolerable discomfort or no pain than those treated with bupivacaine (OR = 10.2) who reported moderate to severe pain as shown in Table 2.

Table 2 Pain assessment in the first 24 hours postoperatively. Source: Medical History

Pain assessment	Group A		Group B		Total	
	NO.	%	NO.	%	NO.	%
No pain	6*	10,0	1	1,7		11,7
Tolerable discomfort	21*	35,0		5		
Moderate pain		3,3		20,0		23,3
Severe pain	1	1,7		23,3		
Total		50,0		50,0		

OR= 10.286; 95% CI= 5.924-19.745 sig=1.03E-43

Table 3 shows that those treated with morphine-bupivacaine were 10 times more likely to have analgesia of more than twenty-four hours than those treated with bupivacaine (OR=10.7) who had analgesia of less than 12 hours.

Source: Medical History

Table 3 Duration of analgesia

Time of duration of analgesia	Group A		Group B		Total	
	NO.	%	NO.	%	NO.	%
Less than 12 hours		3,3		46,7		
12 hours -24 hours	5	8,3		3,3		11,7
More than 24 hours	23*	38,3	-	-		38,3
Total		50,0				

OR=10.796 CI95%= 3.792-22.274 sig=4.965E-12

Table 4 demonstrates that patients treated with morphine-bupivacaine were approximately 8 times more likely to have good perceived satisfaction than those treated with bupivacaine (OR=7.8).

Table 4 Perceived satisfaction with postoperative analgesia. Source: Medical History

Perceived satisfaction	Group A		Group B		Total	
	NO.	%	NO.	%	NO.	%
Good	27*	45,0		26,7		71,7
Regular		3,3		20,0		23,3
Mala	1	1,7		3,3		5,0
Total		50,0		50,0		

OR=7.875 CI95%=2.854-18.487 sig=1.01E-43

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Discussion

The time and quality of analgesia as well as the adverse reactions in the present investigation coincide with the report of Habib, Muir, White, Spahn, Olufolabi and Breen,[21] who designed a study to determine the efficacy of intrathecal morphine in patients who underwent postpartum fallopian tube ligation.They formed two groups and administered bupivacaine, to one of which intrathecal morphine was added at a dose of 50 micrograms to achieve postoperative analgesia. In the morphine group, pain was less intense, with statistical significance in the results, and there were no significant differences in the appearance of adverse effects such as pruritus, nausea and sedation, but vomiting occurred more frequently. Despite this, the authors recommended it, since it provided more prolonged analgesia than when not used.

As in other investigations,[22,23] the higher frequency of side effects observed in the morphine/bupivacaine group in this one may be explained by the pharmacokinetic characteristics of this opioid. The hydrophilic characteristics of morphine allow it to ascend through the cerebrospinal fluid at a much higher rate than that observed with hydrophobic opioids, such as fentanyl. This allows morphine to come into contact with emetogenic centers located in the area postrema.[24] This upward movement has been confirmed, among other ways, by demonstrating that the onset of nausea and vomiting coincides with the onset of analgesia at the trigeminal level.[25] Although a proportion of fentanyl is absorbed systemically and by this route can also reach the trigeminal center, perhaps the concentrations do not reach such triggering levels of nausea and vomiting, as occurs with morphine.[26,27]

Other factors that influence the onset of nausea and vomiting such as delayed gastric emptying and vestibular sensitization during movement may not be as influential as the direct exposure of the emetogenic center to the drug.[27] In relation to pruritus, it has been mentioned that its cause is due to histamine release, however, this does not seem to be the main factor, since in general the response to antihistamines is poor. On the other hand, experimental studies show that the activation of the miu receptors of the dorsal horn produces in parallel analgesia and pruritus, both reversed when pure antagonists such as nalmefene are used. It has been postulated then, that it is caused by the excitatory action at the spinal cord level, particularly with morphine, since this has facilitating actions of the nociceptive neurons of the dorsal and ventral horn.[28] The reported experiences of large series show a clear trend that confirms the findings of this work.

If we group the reports that include lipid-soluble opioids such as fentanyl, sufentanil and meperidine, we observe a lower frequency of pruritus, nausea and vomiting than the series where morphine or diamorphine, which is also a predominantly water-soluble opioid, was administered.[25–27] The adverse effects detected in this study are very similar to those reported by Fuentes Ruiz et al,[27] where no cases of respiratory depression were reported.

The association of increased time and quality of postoperative analgesia results in greater subjective satisfaction on the part of the patient, who feels benefited with the application of increasingly effective therapeutic schemes, as demonstrated in the study, coinciding with Hefni and his group,[29] Graudins and colleagues[30] and Adamau collaborators[31] who report subjective satisfaction in patients treated with opioids for pain control.

We conclude that the association of morphine-bupivacaine resulted in higher quality analgesia than bupivacaine in gynecologic interventions with better results in relation to analgesia time and postoperative pain assessment. The side effects caused by its administration can be efficiently managed without altering postoperative recovery.

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None.

Conflicts of interest

The authors declare that they have no competing interests.

Referencres

1. White PF, Elvir-Lazo OL, Zaentz AS, et al. Does small-dose fentanyl improve perioperative outcomes in the ambulatory setting? A randomized, double-blind, placebo-controlled study. *Acta Anaesthesiol scand.* 2015;59(1):56–64.
2. Takigawa C, Goto F, Tanda S, 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. *J Clin Oncol.* 2015;45(1):67–74.
3. Yoshida K, Nishizawa D, Ichinomiya T, et al. Prediction formulas for individual opioid analgesic requirements based on genetic polymorphism analyses. *PLoS One.* 2015;10:e0116885.
4. Yang CH, Tian X, Yin HB, et al. Sedation and analgesia with fentanyl and etomidate for intrathecal injection in childhood leukemia patients. *Medicine (Baltimore).* 2015;94:e361.
5. Xing SZ, 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*. 2015;23(3):753–759.
6. Sviggum HP, Yacoubian S, Liu X, et al. The effect of bupivacaine with fentanyl temperature on initiation and maintenance of labor epidural analgesia: a randomized controlled study. *Int J Obstet Anesth.* 2015;24(1):15–21.
7. Robleda G, Roche-Campo F, Urrutia 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. *J Adv Nurs*. 2015;71(2):441–450.
8. Craig MG, Grant EN, Tao W, et al. A randomized control trial of bupivacaine and fentanyl versus fentanyl-only for epidural analgesia during the second stage of labor. *Anesthesiology.* 2015;122(1):172–177.
9. Chen CC, Yang CC, Hu CC, et al. Acupuncture for pain relief after total knee arthroplasty: a randomized controlled trial. *Reg Anesth Pain Med.* 2015;40(1):31–36.
10. Bouattour K, Moyano-Tidou G, Le Gouez A, et al. Epidural bleeding after labor epidural analgesia. *Ann Fr Anesth Reanim*. 2014;33(12):690–692.
11. Júnior Ade P, Erdmann TR, Santos TV, et al. Comparison between continuous thoracic epidural and paravertebral blocks for postoperative analgesia in patients undergoing thoracotomy: Systematic review. *Braz J Anesthesiol.* 2013;63:433–442.
12. Holler JP, Ahlbrandt J, Burkhardt E, 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. *Ann Surg.* 2013;258(6):989–993.
13. Winacoo JN, Maykel JA. Operative anesthesia and Pain control. *Clin Colon Rectal Surg.* 2009;22(1):41–46.
14. Rivera Castillo ME. Effectiveness of multimodal analgesia in pain control after open cholecystectomy in HEODRA-León, January-October, 2019 [thesis]. Nicaragua: Universidad de León; 2020.

15. Quiñones Ríos ZC. Postoperative analgesia with hyperbaric versus isobaric bupivacaine after subarachnoid block for cesarean section at Hospital Regional Lambayeque July 2019-April 2020 [thesis]. Peru: Pedro Ruiz Gallo University; 2020.

16. Ordoñez Villa ÁL. Anesthetic characteristics and acceptability of low doses of intrathecal bupivacaine associated with opioids for postpartum tubal ligation [thesis]. Colombia: Universida Autónoma; 2020.

17. Viderman D, Ben-David B, Sarria-Santamera A. Analysis of cardiac arrests related to bupivacaine and ropivacaine in regional anesthesia: a systematic review of case reports. *Revista Española de Anestesiología y Reanimación [Internet]*. 202168(8):472–483.

18. Burgos MG, Quiroz MM, Ruiz A, et al. Intervention to improve quality in pain assessment and management. *Horizon Journal of Nursing [Internet]*. 2020;15(1):101–108.

19. Porras Rojas M. Postoperative analgesia for cesarean section [thesis]. Costa Rica: University of Costa Rica; 2020.

20. Simonetti MP. Cardiotoxicity of bupivacaine: fact or fiction. Brazilian Journal of Anesthesiology [Internet]. 2020;34(6):446–447.

21. Maranhao M VM, Maranhao M HC. Emprego do fentanil, subarachnoid, no controle da dor pós-operatória. *Brazilian Journal of Anesthesiology [Internet].* 2020; 41(3):163–165.

22. Pereira R IC, de Oliveira A S, Cecatti J G. Efeitos da associação bupivacaína e sufentanil na analgesia do trabalho de parto em primigestas. *Brazilian Journal of Anesthesiology [Internet*]. 2020; 9(5):327–331.

23. Lopes M B, de Sousa L R, Porsani D F, et al. Association of intra-articular bupivacaine and morphine for postoperative analgesia in arthroscopic knee surgery. Brazilian Journal of Anesthesiology [Internet]. 2020;49(3):165–168.

24. Fiorentin JZ, Martins AV, Cañola J MV, et al. Comparison between subarachnoid morphine and femoral nerve block for analgesia after ligamentous nerve reconstruction a randomized clinical study. *Braz J Anesthesiol*. 2020;70(6):613–619.

25. Nunes Guimarães GM, Gomes da Silva HB, Ashmawi HA. Risk factors for post- caesarean nausea and vomiting: a prospective prognostic study. *Braz J Anestesiologia.* 2020;70(5):457–463.

26. Vélez Saavedra FI. Effectiveness of Ondansetron as prophylaxis of intrathecal Fentanyl-induced pruritus [thesis]. Peru: University of Trujillo; 2020.

27. Fuentes Ruiz A. Comparison of isobaric bupivacaine with hyperbaric bupivacaine in regional anesthesia for cesarean section in pregnant women at Hospital Manuel Núñez Butron de Puno, year 2020 [thesis]. Peru: Universidad Nacional del Altiplano; 2020. http://repositorio.unap.edu.pe/handle/UNAP/13913. http://repositorio.unap.edu.pe/handle/UNAP/13913

28. Pérez Mejía M. Hemodynamic changes in cesarean patients under spinal anesthesia with Bupivacaine at different doses-Hospital Belén de Lambayeque-2018 [thesis]. Peru: Pedro Ruiz Gallo University; 2020. Available at: [thesis]. Peru: Pedro Ruiz Gallo University; 2020

29. Hefni AF, Mahmoud MS, Al Alim AA. Epidural dexamethasone for post-operative analgesia in patients undergoing abdominal hysterectomy: A dose ranging and safety evaluation study. *Saudi J Anaesth.* 2014;8(3):323–327.

30. Graudins A, Meek R, Egerton-Warburton D, 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. *Ann Emerg Med*. 2015;65(3):248-254.e1.

31. Adamou N, Tukur J, Muhammad Z, 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. *Niger Med J.* 2014;55(5):369–373.

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