



Original Article (Special Issue)

Post Cesarean Section Analgesic Effects of Intravenous Pethidine and Diclofenac Suppository after Spinal Anesthesia: A Randomized Clinical Trial

Pourya Adibi, Majid Vatankhah , Mehrdad Malekshoar , Bibi Mona Razavi, Tayyebeh Zarei*

Anesthesiology, Critical Care and Pain Management Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

ARTICLE INFO

Article history

Receive: 2022-03-31

Received in revised: 2022-04-10

Accepted: 2022-06-15

Manuscript ID: JMCS-2205-1528

Checked for Plagiarism: **Yes**

Language Editor:

[Dr. Behrouz Jamalvandi](#)

Editor who approved publication:

[Professor Dr. Ali Delpisheh](#)

DOI:10.26655/JMCHMSCI.2022.7.2

KEYWORDS

Pethidine

Diclofenac

Pain

Cesarean section

ABSTRACT

Introduction: One of the most difficult challenges after a C-section is minimizing pain. The goal of this study was to see how intravenous pethidine and diclofenac suppository altered pain following a cesarean section performed under spinal anesthesia.

Methods: In this randomized clinical trial on elective cesarean section candidates, patients were randomly assigned to one of two groups receiving intravenous pethidine or diclofenac suppository. Patients' pain was scored using the Visual Analogue Scale (VAS) pain measuring instrument at different times of entry to the recovery room, 30 and 60 minutes in recovery and 2, 4 and 6 hours after surgery.

Results: The incidence of pain (VAS>3) in groups receiving pethidine or diclofenac was significantly different at 30 and 60 minutes of entering recovery room. Therefore, more pain was reported in the group receiving pethidine (P-value = 0.001 and P-value = 0.014). However, there was no significant differences in other periods analyzed.

Conclusion: Diclofenac suppository greatly lowers the occurrence of pain after cesarean section compared with intravenous pethidine and has a more appropriate effect, according to the findings of this study. Therefore, it is recommended to use diclofenac suppository to reduce the incidence of pain in patient who have undergone cesarean section.

GRAPHICAL ABSTRACT



* Corresponding author: Tayyebeh Zarei

✉ E-mail: Email: dr.tayyebah.zarei@hums.ac.ir

© 2022 by SPC (Sami Publishing Company)

Introduction

In recent years in the world, including Iran, the rate of cesarean section has increased [1], so that cesarean section has become one of the most common surgeries in our country [1-2]. The incidence of cesarean section is reported to be 10%-20% at the international level and 50%-60% in Iran [3]. Acute pain after cesarean section is one of the known complications of surgery and effective pain management during cesarean section is a top priority in cesarean section [4]. There are several strategies for moderating pain in patients; however, despite the various treatments, there is still insufficient pain alleviation and patient satisfaction [5]. Many pharmacological and non-pharmacological methods are used during pregnancy and cesarean section to control pain, nausea, vomiting and shivering [6-9]. The drugs chosen for cesarean delivery are opioids such as morphine and pethidine [10]. The most common opioid used in gynecology and obstetrics is pethidine (meperidine), which has a duration of about 1-4 hours [11]. Pethidine is used to treat pain [12] and shivering [13] in women undergoing cesarean section. The use of new drugs, including nonsteroidal anti-inflammatory drugs (NSAIDs), $\alpha 2$ agonists, and anticholinergics, may play an important role in improving the effectiveness of conventional techniques by reducing complications due to the reduced need for opioids [14]. Both ketorolac and pethidine can cause analgesia after cesarean section [12]. Some have reported that diclofenac can significantly reduce postoperative analgesia [15]. Few trials have been conducted so far comparing intravenous pethidine and diclofenac suppository on pain after cesarean section with spinal anesthesia. The goal of this study was to examine the effects of intravenous pethidine and diclofenac suppository on pain following a cesarean section performed under spinal anesthesia.

Methods

This sub-study was extracted from main protocol (IR.HUMS.REC.1397.201) that was a double-blind randomized clinical trial on adult patients aged 20 to 40 years with ASA I, II. Candidates for

elective cesarean section were chosen from Hormozgan Persian Gulf Hospital in 2018 from the same clinical trial about the primary outcome of shivering. This study received ethical code from the affiliated university (IR.HUMS.REC.1397.201). All patients were given the necessary explanations about the study and they declared their consent to participate in the study in written. All ethical considerations related to the Helsinki principles were taken into account in this study. Patients who had taken analgesics before surgery, those having contraindications to spinal anesthesia (high ICP, coagulation disorders, anticoagulants, and patients who had contraindications to NSAIDs or pethidine); ASA \geq 3, intraoperative hemorrhage, hysterectomy, and emergency patients were excluded. The sample size was calculated based on the study of Sarvari *et al.* [16] and the formula for determining the sample size in analytical studies was used for each group of 65 and a total of 130. Patients were randomly divided into two groups receiving intravenous pethidine and diclofenac suppository using a random number table. All standards needed for C-section under spinal anesthesia were considered according to the details are published elsewhere.

After the baby was born, the first group was slowly injected with 0.5 mg/kg of intravenous pethidine and second group was given a 100 mg diclofenac suppository. Contraindications of prescribing any of these medications were considered for special circumstances.

Study checklist included demographic variables (age, weight, sex) and systolic and diastolic blood pressure, before and after surgery and the duration of analgesia and pain intensity at the time of entry into recovery, 30 and 60 minutes in recovery and 2, 4 and 6 hours after surgery. At the same time, the intensity of pain was measured based on visual instrumentation of pain (VAS).

VAS of more than 3 was considered as pain incidence. Data were analyzed using SPSS software version 19 and descriptive statistics (mean-standard deviation-percentage, etc.) and independent t-test, one-way ANOVA with

repeated measures and chi-square. P-value <0.05 was considered as a significant level.

Results

The baseline characteristics of this study subjects are reported in main clinical trial on shivering. 130 patients aged 20-40 years were entered the

main clinical trial that did not differ in case of age and mean weight (details published elsewhere). In intravenous pethidine group, the mean systolic blood pressure was 116.23 ± 10.28 mm Hg, while in diclofenac suppository group, it was 115.91 ± 10.72 mm Hg. There was no statistically significant difference in systolic blood pressure between the two groups at other times (Table 1).

Table 1: Hemodynamic (SBP) changes of study participants

Systolic Blood Pressure (SBP)	Group				P-value
	Pethidine		Diclofenac		
	Mean	SD	Mean	SD	
Enter Recovery	116.23	10.28	115.91	10.72	0.740
30 minutes after surgery	116.46	10.63	115.89	10.13	0.644
60 minutes after surgery	116.29	10.19	114.31	9.80	0.255
2 hours after surgery	114.51	9.16	115.46	9.71	0.550
4 hours after surgery	114.15	8.50	113.62	7.58	0.544
6 hours after surgery	113.77	7.18	113.77	7.61	0.770
Friedman test	7.487		9.290		
P-value	0.187		0.098		

The mean diastolic blood pressure Enter Recovery was 74.17 ± 8.72 mm Hg in intravenous pethidine group and 71.15 ± 7.79 mm Hg in diclofenac suppository group, which was a

significant difference between the two groups ($P = 0.22$). At other times, there was no statistically significant difference between diastolic blood pressure between the two groups (Table 2).

Table 2: Hemodynamic (DBP) changes of study participants

Diastolic Blood Pressure (DBP)	Group				P-value
	Pethidine		Diclofenac		
	Mean	SD	Mean	SD	
Enter Recovery	74.17	8.72	71.15	7.79	0.022
30 minutes after surgery	73.35	7.25	71.22	7.93	0.113
60 minutes after surgery	72.18	7.37	71.82	6.90	0.885
2 hours after surgery	73.02	5.95	72.28	6.41	0.504
4 hours after surgery	72.89	6.35	73.26	6.62	0.803
6 hours after surgery	72.86	6.38	72.38	5.24	0.699
Friedman test	5.002		1.811		
P-value	0.416		0.875		

At the time of Enter Recovery, 13 patients in intravenous pethidine group experienced pain and 52 did not report pain. Six patients in diclofenac suppository group reported pain and 59 did not feel pain. At 30 and 60 minutes

postoperatively, there was a significant difference in the incidence of pain between the two groups ($P < 0.001$ and $P < 0.014$). At other times, there was no significant difference between the two groups.

Table 3: Pain incidence in study participants

Pain (VAS>3)		Group				P-value
		Pethidine		Diclofenac		
		Number	Percent	Number	Percent	
Enter Recovery	No	52	80.0%	59	90.8%	0.082
	Yes	13	20.0%	6	9.2%	
30 minutes after surgery	No	40	61.5%	57	87.7%	0.001*
	Yes	25	38.5%	8	12.3%	
60 minutes after surgery	No	41	41.5%	27	63.1%	0.014*
	Yes	38	58.5%	24	36.9%	
2 hours after surgery	No	36	55.4%	31	47.7%	0.380
	Yes	29	44.6%	34	52.3%	
4 hours after surgery	No	37	56.9%	39	60.0%	0.722
	Yes	28	43.1%	26	40.0%	
6 hours after surgery	No	44	67.7%	47	72.3%	0.566
	Yes	21	32.3%	18	27.7%	

Discussion

The high side effects and high cost of opioid drugs are the reasons for the routine use of NSAIDs as a]/DFEW, P[KGGGGGVWKEDIC]SICKKLDUD9P was substantially different mostly in 30 and 60 minutes, indicating the group receiving pethidine had more pain. Taghinezhad *et al.*, compared the effects of pethidine and diclofenac sodium on pain intensity after cesarean surgery in their research. Diclofenac sodium was more effective than pethidine in decreasing pain after a cesarean section, according to the findings of their research [21]. A similar study showed that the incidence of pain in the diclofenac group was significantly lower than in the pethidine group [22]. Another study indicated that diclofenac significantly reduced postoperative pain compared with pethidine [16]. Other studies also support that diclofenac could help analgesia after cesarean section [23].

The findings of the previous investigations are congruent with those of the current study. The incidence of pain in the diclofenac group was considerably lower than the pethidine group at 30 and 60 minutes in this trial.

Other medications are also being used in this era. Pethidine and ketorolac are shown to have similar effects on post C-section pain [24]. Also, acetaminophen was more effective in controlling pain in cesarean section women under spinal anesthesia than pethidine [25]. Mahdavi *et al.*, compared the effectiveness of morphine and diclofenac in decreasing pain after a cesarean

section. Diclofenac suppository lowered pain score in the first twenty-four hours after surgery, which was substantial in the first twelve hours, according to the findings of this study [26]. The findings of this study do not agree with those of Hidaka *et al.*, [27] and Gin *et al.*, [28] [12]. Both opioids and NSAIDs were equally beneficial in analgesia after cesarean section in both investigations.

Conclusion

The results of the present study showed that diclofenac suppository significantly reduced the incidence of pain after cesarean section compared with intravenous pethidine and had a more appropriate effect. Therefore, it is recommended to use diclofenac suppository to reduce the incidence of pain in patients who have undergone cesarean section.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

Conflict of Interest

There are no conflicts of interest in this study.

ORCID

Majid Vatankhah

<https://www.orcid.org/0000-0002-2053-1138>

Mehrdad Malekshoar

<https://www.orcid.org/0000-0002-3361-5429>

Tayyebeh Zarei

<https://www.orcid.org/0000-0001-8605-7742>

References

- [1]. Ganji F., Raeisi R., Khosravi S.A., Soltani P., Kasiri K.A., Jafar Zadeh L., et al. Effect of a participatory intervention to reduce the number of unnecessary cesarean sections performed in Shahrekord, Iran. *Shahrekord University of Medical Sciences Journal*, 2006, **8**:14 [[Publisher](#)]
- [2]. Rafieeyan Z., Azarbarzin M., Safaryard S., The effect of music therapy on anxiety, pain, nausea and vital signs of caesarean section clients in Dr. Shariatee hospital of Esfahan in 2006. *Medical Science Journal of Islamic Azad University, Tehran Medical Unite*, 2009, **19**:80 [[Google Scholar](#)], [[Publisher](#)]
- [3]. Badiie S., Ravanshad Y., Azarfar A., Dastfan F., Babayi S., Mirzayi N., Survey of cesarean deliveries and their causes in hospitals affiliated to Mashhad University of medical sciences, Iran, 2011, *Iran J Obstet Gynecol Infertil*, 2013, **16**:10 [[Google Scholar](#)], [[Publisher](#)]
- [4]. Sutton C.D., Carvalho B., Optimal Pain Management after Cesarean Delivery, *Anesthesiol. Clin.*, 2017, **35**:107 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [5]. Sridhar G., Post Cesarean delivery pain management, *International Journal of Obstetric Anesthesia*, 2007, **16**:186 [[Crossref](#)]
- [6]. Malekshoar M., Vatankhah M., Rasekh Jahromi A., Ghasemloo H., Mogharab F., Ghaedi M., Abiri S., Taheri L., Roostaei D., Kalani N., Hatami N., Sadeghi S., Control in women under spinal anesthesia: A narrative review on the role of drugs, *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2021, **24**:61 [[Google Scholar](#)], [[Publisher](#)]
- [7]. Ghasemloo H., Sadeghi S., Jarineshin H., Jarineshin H., Rastgarian A., Taheri L., Rasekh Jahromi A., Mogharab F., Kalani N., Roostaei D., Hatami N., Vatankhah M.. Control of nausea and vomiting in women undergoing cesarean section with spinal anesthesia: A narrative review study on the role of drugs, *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2021, **24**:98 [[Google Scholar](#)], [[Publisher](#)]
- [8]. Jarineshin H., Sadeghi S., Malekshoar M., Sanie Jahromi M., Rahmanian F., Hatami N., Kalani N., Non-pharmacological methods of controlling nausea and vomiting during pregnancy in Iran: A narrative review study, *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2022, **24**:110 [[Google Scholar](#)], [[Publisher](#)]
- [9]. Masoumi Z., Keramat A., Hajiaghaee R., Systematic Review on Effect of Herbal Medicine on Pain after Perineal Episiotomy and Cesarean Cutting, *Journal of Medicinal Plants*, 2011, **10**:1 [[Google Scholar](#)], [[Publisher](#)]
- [10]. Kalani N., Zabetian H., Rastgarian A., Damshenas M., Nabipour M., Mogharab F., Hatami N., Rahmanian M., Comparison of the effect of adding pethidine to bupivacaine and ropivacaine on pain intensity in women undergoing elective cesarean section with spinal anesthesia: A double-blind randomized clinical trial Study. *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2022, **25**: inpress
- [11]. Cunningham F., Leveno K., Bloom S., Hauth J., Rouse D., Williams Obstetrics (Repost). 23th ed. New York: McGraw-Hill Professional, 2009 [[Google Scholar](#)]
- [12]. Gin T, Kan AF, Lam KK, O'Meara ME. Analgesia after caesarean section with intramuscular ketorolac or pethidine, *Anaesthesia and intensive care*, 1993, **21**:420 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [13]. Shami S., Nasser K., Shirmohammadi M., Sarshivi F., Ghadami N., Ghaderi E., Pouladi M., Barzanji A., Effect of low dose of intrathecal pethidine on the incidence and intensity of during cesarean section under spinal anesthesia: a randomized, placebo-controlled, double-blind clinical trial, *Drug Des. Devel. Ther.*, 2016, **10**:3005 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [14]. Gadsden J., Hart S., Santos A.C., Post-cesarean delivery analgesia, *Anesthesia & Analgesia*, 2005, **101**:S62 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [15]. Ebrahim A.J., Mozaffar R., Nadia B.H., Ali J., Early post-operative relief of pain and using diclofenac suppository versus intravenous

- pethidine in spinal anesthesia, *Journal of Anaesthesiology Clinical Pharmacology*, 2014, **30**:243 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [16].Soroori Z.Z., Sharami S.H., Heidarzadeh A., Shokri L., The comparison between suppository diclofenac and pethidine in post-cesarean section pain relief: a randomized controlled clinical trial, *J Res Med Sci.*, 2006, **11**:292 [[Google Scholar](#)]
- [17].Surakarn J., Tannirandorn Y., Intramuscular diclofenac for analgesia after cesarean delivery: a randomized controlled trial, *Medical journal of the Medical Association of Thailand*, 2009, **92**:733 [[Google Scholar](#)], [[Publisher](#)]
- [18].Lavand'homme P., Improving postoperative pain management: Continuous wound infusion and postoperative pain, *European Journal of Pain Supplements*, 2011, **5**:357 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [19].Standing J.F., Tibboel D., Korpela R., Olkkola K.T., Diclofenac pharmacokinetic meta-analysis and dose recommendations for surgical pain in children aged 1–12 years, *Pediatric Anaesthesia*, 2011, **21**:316 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [20].Gan T.J., Diclofenac: an update on its mechanism of action and safety profile, *Current medical research and opinion*, 2010, **26**:1715 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [21].Taghinezhad H., A Study on Efficacy of Pethidine and Diclofenac on Pain Severity after Cesarean Section, *Journal of Ilam University of Medical Science*, 2007, **14**:7 [[Google Scholar](#)], [[Publisher](#)]
- [22].Rahmanpoor H., Hosseini S.N., Mousavinasab S.N., Tadayon P., Karimi F., Comparison of diclofenac with pethidine on the pain after cesarean section, *International Journal of Pharmacology*, 2007, **3**:201 [[Google Scholar](#)], [[Publisher](#)]
- [23].Siddik S.M., Aouad M.T., Jalbout M.I., Rizk L.B., Kamar G.H., Baraka A.S., Diclofenac and/or propacetamol for postoperative pain management after cesarean delivery in patients receiving patient controlled analgesia morphine, *Regional Anesthesia & Pain Medicine*, 2001, **26**:310 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [24].Zangoue M., Bijari B., Abasspour Z., Tolyat M., Comparison of the Effect of Ketorolac and Pethidine on Pain Control after Cesarean Section Surgery, *Journal of North Khorasan University of Medical Sciences*, 2019, **11**:73 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [25].Fattahi Z., Asadpour E., Dehghanpishhe L., Karami A., Fakherpour A., Comparing the effects of Acetaminophen, Meperidine, and their combination on postoperative pain management in elective cesarean section, *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2019, **22**:1 [[Google Scholar](#)], [[Publisher](#)]
- [26].Mahdavi A., Telkabadi Z., Aleyasin A., Agha Hosseini M., Safdarian L., Momenzadeh A., Comparison of Morphine Suppository and Diclofenac Suppository for Pain Management After Elective Caesarean Section, *Acta Medica Iranica*, 2016, **54**:709 [[Google Scholar](#)], [[Publisher](#)]
- [27].Hidaka I., Asai T., Miki T., Kubota T., Kawachi S., [Combined use of intrathecal morphine and diclofenac suppository for postoperative analgesia after caesarean section]. *Masui. The Japanese Journal of Anesthesiology*, 2003, **52**:1056 [[Google Scholar](#)], [[Publisher](#)]

HOW TO CITE THIS ARTICLE

Pourya Adibi, Majid Vatankhah, Mehrdad Malekshoar, Bibi Mona Razavi, Tayyebeh Zarei. Post Cesarean Section Analgesic Effects of Intravenous Pethidine and Diclofenac Suppository after Spinal Anesthesia: A Randomized Clinical Trial. *J. Med. Chem. Sci.*, 2022, 5(7) 1150-1155

<https://doi.org/10.26655/JMCHMSCI.2022.7.2>

URL: http://www.jmchemsci.com/article_152305.html