

Intrathecal Pethidine as a Sole Anesthetic Agent in Cesarean Section: Case Report for Clinical Education

Sina Hassannasab*, Avasadat Mirkatouli, Ali Jabbari

Department of Anesthesiology and Intensive Care, Golestan University of Medical Sciences, Gorgan, Iran.

ARTICLE INFO

Article history:

Received 22 January 2021

Revised 14 February 2021

Accepted 28 February 2021

Keywords:

Opioid;

Pethidine;

Cesarean Section;

Spinal Anesthesia

ABSTRACT

Pethidine was the first synthetic opioid to be used to provide analgesia in humans and was shown also to have local anesthetic activity comparable with that of cocaine. The neonatal Apgar score after birth is an important factors of mortality of the newborn. In this regard, the type of drug used for the cesarean section is very important in the Apgar score of the cesarean section. Pethidine is an intermediate lipid-soluble opioid with both a postoperative analgesic mechanism and a sensory block which is known as the only opioid which can be used alone in the cesarean section under spinal anesthesia. We used pethidine as an alternative to bupivacaine in patients going under cesarean section.

Pethidine is a phenyl-piperidine derivative with a unique property of local anesthetic activity in opioids family. Because of its local activity which is unique, it is the only opioid that can be used as a sole anesthetic agent in spinal anesthesia. Although, its sensory and motor blocks are comparative to that of aminoamid local anesthetics, but its use has not been expanded widely. There are some research that compared the effectiveness of its use in anesthesia but the data are really limited. In developing country because of the limitation of resources, pethidine is a drug with a lower price and more availability in comparison to local anesthetics and can be a good alternative to those drugs in most of surgeries that can be done under spinal anesthesia.

In this case report, we chose to use pethidine as a sole anesthetic agent because in the meantime bupivacaine or any other type of local anesthetics were not available in our hospital (Velayat Hospital, Rask, Sistan and Baluchestan Province). Here is the report of three patients who were anesthetized with this unconventional anesthetic technique.

Case Report

Case 1

A 32 years old white, gravid 1 para 0, 160 cm, 75 kg female presented at 36 weeks gestation with twin pregnancy and ruptured fetal membranes for cesarean section. She had no history of any kind of disease, allergy, surgery or drug use. Blood pressure and heart rate was within normal range. The pediatrician was informed about the surgery and she was available. An intrathecal injection of 1 mg/kg pethidine (1.5 mL Pethidine, preservative-free, abureyhan, 50 mg/mL, plus 0.5 mL normal saline) was given via L3/4 intervertebral space using a 25 gauge, Quincke point needle with first attempt and sensory and motor block was confirmed via bromage score of 4 and pinprick test 10 minutes later. Operation proceeded without any complication and 2 live male infants were born, with Apgar score of 9 and 10 at one and five minutes, respectively. During the surgery the mother had 2 episodes of hypotension which needed to be treated with ephedrine 5 mg each time. She complained of pruritus during the surgery and 4 mg ondansetron and 2 doses of 10 mg propofol were given, but not helpful at all and unfortunately the exaggerated

The authors declare no conflicts of interest.

*Corresponding author.

E-mail address: Drsina.hsn@Goums.ac.ir

Copyright © 2021 Tehran University of Medical Sciences. Published by Tehran University of Medical Sciences.



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International license (<https://creativecommons.org/licenses/by-nc/4.0/>). Noncommercial uses of the work are permitted, provided the original work is properly cited.

pruritus even continued in the PACU. 90 minutes after the injection, the motor block started to wear off and also the pruritus began to decrease. By the time patient was being discharged from the PACU she had no pruritus or any other complication.

Case 2

A 20 years old white, gravid 2 para 1, 60 kg female presented at 37 weeks gestation for an elective cesarean section. She had no history of any kind of disease, allergy, surgery or drug use. She was premedicated with 8 mg ondansetron for the reduction of pruritus and nausea. An intrathecal injection of 1 mg/kg pethidine (1.2 mL Pethidine, preservative-free, abureyhan, 50 mg/mL) was given via L3/4 intervertebral space. She had no episode of hypotension or bradycardia during the surgery and no complaint about nausea, but had a mild pruritus which was tolerable. A male live infant was born with Apgar of 9 and 10 at one and five minutes, respectively.

Case 3

A 27 years old white, gravid 1 para 0, 60 kg female presented at 37 weeks gestation for an elective cesarean section because of transverse position of the fetus. She had no history of any kind of disease, allergy, surgery or drug use. She was premedicated with 8 mg ondansetron. An intrathecal injection of 1 mg/kg pethidine (1.2 mL Pethidine, preservative-free, abureyhan, 50 mg/mL) was given via L3/4 intervertebral space. She had no episode of hypotension or bradycardia during the surgery and no complaint about nausea, but had a mild pruritus which was tolerable. A female live infant was born with Apgar of 9 and 10 at one and five minutes, respectively.

Discussion

Spinal anesthesia is the most preferred method for cesarean section. The life and health of the newborn is as important as the mother's, so we should choose a technique or drugs that has the minimum effect on his/her status. Caesarean section is one of the major surgeries in women with an increasing trend in developed and developing countries [1-4]. Spinal anesthesia is the best-preferred method for anesthesia in patients with emergency and elective cesarean section due to a series of advantages such as rapid onset, high success rate, reduced side effects on the mother and the fetus, safety, and efficacy [5-8].

The neonatal Apgar score after birth is an important factor of mortality of the newborn. In this regard, the type of drug used for the cesarean section is very important in the Apgar score of the cesarean section [9]. A meta-analysis of Jaafarpour et al. evaluated the effect of different doses of Pethidine (5 to 40 mg) on the Apgar score of the neonates and the results showed that it has no significant difference both in the Apgar score, maternal

hypotension, and duration of the motor and sensory block [10]. In most studies additive dose of pethidine to local anesthetics were analyzed and there were a few studies or maybe just some case reports which used pethidine as a sole anesthetic agent in spinal anesthesia for cesarean section [10-12]. For other kind of surgeries, such as perianal, lower limb surgeries pethidine was used as sole anesthetic agent, and in all of these studies, it was shown that pethidine is a good alternative to local anesthetic due to its hemodynamic stability, lower shivering and prolonged postoperative analgesia [13-14].

According to Jaafarpour et al. no significant difference was found both in the Apgar score, maternal hypotension, and duration of the motor and sensory block between pethidine and bupivacaine, and in this meta-analysis 40 mg pethidine was considered safe for the neonates and as long as there were some case reports about using pethidine as a sole anesthetic agent, we also used this opioid to anesthetize the patients and we used 1 mg/kg for each one, and there was no complication for the neonates. Although pruritus and nausea occurred, but as long as we did not have any other medication in our hospital to use safely for spinal anesthesia, pethidine could be considered as a good alternative. We have used pethidine for spinal anesthesia on more than 100 patients for lower limb surgeries, and in our experience not only its hemodynamic stability is comparative to bupivacaine, but also its complications and side effects were not that significant but its lower shivering incidence and better postoperative analgesia was significantly superior to local anesthetics. For spinal anesthesia, it was the first time that we used pethidine in parturients, and it was a positive experience.

Conclusion

Pethidine can be a safe drug to be used in intrathecal injections to provide anesthesia for cesarian sections. It has no adverse effect on the newborn's Apgar score or mother's hemodynamics in comparison to local anesthetics. So, in situations like hypersensitivity to aminoester or aminoamid local anesthetics, or unavailability of other drugs for intrathecal injection, we can choose pethidine as a safe and good alternative to provide spinal anesthesia with some advantages over local anesthetics.

References

- [1] Bilgen S, Köner O, Türe H, Menda F, Fiçicioğlu C, Aykaç B. Effect of three different doses of ketamine prior to general anaesthesia on postoperative pain following Caesarean delivery: a prospective randomized study. *Minerva Anesthesiol.* 2012; 78(4):442-9.
- [2] Conde-Agudelo A, Nieto A, Rosas-Bermudez A,

- Romero R. Misoprostol to reduce intraoperative and postoperative hemorrhage during cesarean delivery: a systematic review and metaanalysis. *Am J Obstet Gynecol.* 2013; 209(1): 40.e1-40.e17.
- [3] Jaafarpour M, Vasigh A, Khajavikhan J, Khani A. Effect of ketofol on pain and complication after Caesarean delivery under spinal anaesthesia: A randomized double-blind clinical trial. *J Clin Diagn Res.* 2017; 11(3):UC04-07.
- [4] Beiranvand S, Noparast M, Eslamizade N, Saeedikia S. The effects of religion and spirituality on postoperative pain, hemodynamic functioning and anxiety after cesarean section. *Acta Med Iran.* 2014; 52(12):909-15.
- [5] Anaraki AN, Mirzaei K. The effect of different intrathecal doses of meperidine on shivering during delivery under spinal anesthesia. *Int J Prev Med.* 2012; 3(10):706-12.
- [6] Rastegarian A, Ghobadifar MA, Kargar H, Mosallanezhad Z. Intrathecal meperidine plus lidocaine for prevention of shivering during cesarean section. *Korean J Pain.* 2013; 26(4): 379-86.
- [7] Shami S, Nasseri 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 shivering during cesarean section under spinal anesthesia: a randomized, placebo-controlled, double-blind clinical trial. *Drug Des Devel Ther.* 2016; 10: 3005–3012.
- [8] Farzi F, Mirmansouri A, Forghanparast K, Heydarzadeh A, Abdollahzadeh M, Moghadam FJ. Addition of intrathecal fentanyl or meperidine to lidocaine and epinephrine for spinal anesthesia in elective cesarean delivery. *Anesth Pain Med.* 2014;4(1):e14081.
- [9] Çakırtekin V, Yıldırım A, Bakan N, Çelebi N, Bozkurt Ö. Comparison of the effects of thiopental sodium and propofol on haemodynamics, awareness and newborns during caesarean section under general anaesthesia. *Turk J Anaesthesiol Reanim.* 2015; 43(2):106-12.
- [10] Jaafarpour M, Taghizadeh Z, Shafiei E, Vasigh A, Sayehmiri K. The Effect of Intrathecal Meperidine on Maternal and Newborn Outcomes After Cesarean Section: A Systematic Review and Meta-Analysis Study. *Anesth Pain Med.* 2020;10(2):e100375.
- [11] Vassiliadis RM, Taylor PG. Spinal pethidine for elective caesarean section. *Anaesth Intensive Care.* 2013; 41(1):113-5.
- [12] Camann WR, Bader AM. Spinal anesthesia for cesarean delivery with meperidine as the sole agent. *Int J Obstet Anesth.* 1992; 1(3):156-8.
- [13] Bakhsha F, Behnampour N. Saddle block anaesthesia with meperidine for perineal surgery. *Journal of Clinical and Diagnostic Research.* 2010;4(1).
- [14] Pandu Naik R, Chandra Shekar N, Pooja J, Raghuram CG. "Intrathecal Pethidine as a Sole Anesthetic Agent for Lower Limb Surgeries". *Journal of Evidence based Medicine and Healthcare.* 2015; 2(39):6291-6299.