

# Low-Dose Propofol for the Treatment of Severe Postpartum Post-Dural Puncture Headache: A Case Report

Maryam Vosoughian<sup>1</sup> , Shideh Dabir<sup>2\*</sup> , Mastaneh Dahi<sup>1</sup> , Mohammadreza Moshari<sup>1</sup> 

1. Department of Anesthesiology & Critical Care, Anesthesiology Research Center, Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

2. Department of Anesthesiology & Critical Care, Tracheal Diseases Research Center, Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.



**Citation:** Vosoughian M, Dabir Sh, Dahi M, Moshari M. Low-Dose Propofol for the Treatment of Severe Postpartum Post-Dural Puncture Headache: A Case Report. Case Reports in Clinical Practice. 2021; 6(4):169-172.

**Running Title:** Propofol for PDPH Treatment



**Article info:**

**Received:** 03 July 2021

**Revised:** 13 July 2021

**Accepted:** 18 August 2021

**Keywords:**

Post-dural puncture headache;  
Propofol; Postpartum period;  
Pain management

## ABSTRACT

In this report, we presented our experience in treating severe postpartum post-dural puncture headache with low-dose propofol. Short-term use of low-dose propofol provided rapid and complete relief of the headache without recurrence.

## Introduction

**T**Post-Dural Puncture Headache (PDPH) after childbirth is a well-known complication of spinal anesthesia in obstetric patients with a prevalence o

1.5% to 11.2%, depending on the type and size of the spinal needle [1-3]. The average duration of the onset of symptoms is three days after dural puncture. PDPH usually affects fronto-occipital area and is characterized by a positional nature

\* Corresponding Author:

Shideh Dabir, MD.

Address: Department of Anesthesiology & Critical Care, Tracheal Diseases Research Center, Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

E-mail: shdabir@yahoo.com



as it is worsened by a sitting or standing posture and is relieved by lying flat [1]. The diagnosis is mainly clinically based on the history of onset of the headache after a dural puncture as well as its postural nature. The most likely cause of PDPH is the leakage of Cerebrospinal Fluid (CSF) through the dural puncture site. CSF leakage may reduce intracranial CSF pressure and volume resulting in gravitational traction on intracranial pain-sensitive structures and postural headache. PDPH may also be caused in part by compensatory dilation of intracerebral vessels in response to decreased CSF pressure [1-4].

PDPH usually resolves spontaneously, but sometimes it is so severe that can interfere with the daily activities of the mother and care for the new baby or prolong hospital stay. In severe cases, an Epidural Blood Patch (EBP) is the only definite treatment [3, 4]. However, EBP due to its invasive nature has its own contraindications and complications. Several medications have been suggested for severe symptoms in order to avoid EBP; however, their therapeutic effects are controversial [5]. Sedative doses of propofol have been effectively used in treating intractable migraines and nonmigrainous headaches [6-9]. However, very few studies have examined its effect on PDPH [10, 11]. In this report, we presented our experience in using low-dose IV propofol for the treatment of severe postpartum PDPH in two parturients. We used propofol when conventional management failed to relieve headaches and the patients rejected to have an EBP. In both cases, spinal anesthesia was performed with a 25G Quincke needle, PDPH was diagnosed clinically, and the severity of the headache was assessed using a patient-rated numerical rating scale of 0 to 10.

## Case Presentations

### Case 1

A 36-year-old healthy parturient was admitted for a progressive worsening of her postural fronto-occipital headache. The onset of pain was three days after the spinal analgesia for painless labor. The patient was anxious with a pain score of 8 out of 10, which made her stay in bed. The patient was diagnosed with PDPH and was prescribed bed rest, hydration, oral caffeine, acetaminophen, and ibuprofen, but the pain score did not improve within 24 h. The patient did not allow an EBP but accepted our recommendation to use propofol for treating headaches. After obtaining informed consent, she was taken to the operating room. Standard monitoring was placed and propofol (Pofol, Dongkook Pharm. Ltd. Co., Korea) was given intravenously in 10 mg bol-

uses to a maximum dose of 100 mg within 30 min while she was conscious during the entire uneventful procedure. Three hours after therapy, the pain score dropped to 2 out of 10 in the sitting and upright position. One hour later, the pain was completely resolved and she was discharged from the hospital. During the next 48 h of telephone follow-up, she reported complete resolution of the postural headache.

### Case 2

A healthy 41-year-old woman developed a severe fronto-occipital postural headache three days following spinal anesthesia for cesarean delivery. She was restless with a pain score of 8 out of 10, which made her bedridden and stay in the hospital. With the diagnosis of the PDPH, the patient received conventional therapy (bed rest, hydration, oral caffeine, acetaminophen, ibuprofen, and 8 mg of intravenous dexamethasone as a single dose), but there was no improvement in the pain severity. The patient refused to have an EBP but accepted treatment with propofol. After obtaining informed consent, she was transferred to the operating room. Under standard monitoring, she received a total of 50 mg of propofol in 10 mg boluses intravenously over 15 minutes. Then, propofol injection was stopped at her request because of her concern about the secretion of the drug in the breast milk. Two hours later, the pain score reduced to 5 out of 10 and she could sit to breastfeed. Five hours after treatment, the postural pain score reached 3 out of 10, and 10 h after treatment, it was completely disappeared. During three days of follow-up, she remained pain-free.

## Discussion

Our obstetric PDPH cases preferred propofol therapy to EBP because of its non-invasive nature. Propofol was given intravenously in small divided doses to a maximum dose of 100 mg in the first case, and a maximum dose of 50 mg in the second case. The desired effect was achieved in both cases and the patients experienced a progressive reduction in pain scores shortly after receiving propofol; however, the speed of pain relief was faster in the first patient than in the second one. None of them reported a recurrence of the headache within 48 or 72 h of the follow-up.

Women with postpartum PDPH experience an unpleasant situation. EBP is the only definitive therapy in women whose headache is severe enough to restrict their daily activities [3]. On the other hand, EBP has the same risk similar to all epidural procedures, and con-

traindications, such as patient's refusal, coagulopathy, or technical difficulties limit its usage. Hence, several pharmacological treatments have been proposed prior to performing EBP, of which caffeine, theophylline, gabapentin, and hydrocortisone have shown better results [5]. However, there is still insufficient conclusive evidence to support their therapeutic benefits [5, 12]. In this report, short-term treatment with low-dose propofol provided rapid and complete relief of PDPH.

Propofol is a rapid and short-acting popular intravenous anesthetic, which is used for induction and maintenance of anesthesia as well as providing sedation in diagnostic and therapeutic procedures. A sub-anesthetic dose of propofol has also been used successfully in relieving intractable migraines and nonmigrainous headaches [6-9]. However, very few studies have used propofol to treat PDPH. To our knowledge, only two studies have evaluated the effect of propofol on PDPH, in which its effectiveness has been reported similar to our report. Massou et al. [10] reported that intravenous propofol (1 mg/kg) with a total of four doses over 24 h resulted in the complete disappearance of the PDPH the day after spinal anesthesia for varicose veins surgery.

Likewise, Golfam et al. [11] assessed propofol for preventing PDPH following spinal anesthesia for cesarean section. They showed that intraoperative infusion of 30 µg/kg/min of propofol given after delivery of baby significantly reduced both frequency and severity of PDPH during 7 days after spinal anesthesia. The actual mechanism of action of propofol in treating headaches is unclear but it is thought to be mediated by various neurotransmitters in the brain, primarily due to its agonist effect on GABA receptors. Moreover, the propofol efficacy may be related to the inhibition of excitatory responses mediated by N-methyl-D-aspartate [13]. The antinociceptive action of propofol may also be modulated centrally by the opioid system [14].

Based on our experience, propofol as a rapidly acting sedative drug may be an appropriate alternative therapy to EBP for severe postpartum PDPH due to its good safety profile, potent anti-emetic activity, and negligible amount in breast milk [15]. However, further studies are needed to support propofol as a suitable therapeutic option for PDPH.

## Conclusion

The cases presented here showed that the short-term use of low-dose intravenous propofol was very effective in relieving severe post-partum PDPH after spinal anesthesia.

## Ethical Considerations

### Compliance with ethical guidelines

All ethical principles were considered in this manuscript.

### Funding

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

### Conflict of interest

The authors declare no conflict of interest.

## References

- [1] Sachs A, Smiley R. Post-dural puncture headache: The worst common complication in obstetric anesthesia. Seminar in Perinatology. 2014; 38(6):386-94. [\[DOI:10.1053/j.semperi.2014.07.007\]](https://doi.org/10.1053/j.semperi.2014.07.007) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/25177707/)
- [2] Kuczkowski KM. The management of accidental dural puncture in pregnant women: What does an obstetrician need to know? Archives of Gynecology and Obstetrics. 2007; 275(2):125-31. [\[DOI:10.1007/s00404-006-0146-y\]](https://doi.org/10.1007/s00404-006-0146-y) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/17347700/)
- [3] Sabharwal A, Stocks GM. Postpartum headache: Diagnosis and management. Continuing Education in Anaesthesia, Critical Care & Pain. 2011; 11(5):181-5. [\[DOI:10.1093/bjaceaccp/mkr025\]](https://doi.org/10.1093/bjaceaccp/mkr025)
- [4] Ahmed SV, Jayawarna C, Jude E. Post lumbar puncture headache: Diagnosis and management. Postgraduate Medical Journal. 2006; 82(973):713-6. [\[DOI:10.1136/pgmj.2006.044792\]](https://doi.org/10.1136/pgmj.2006.044792) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/16770700/) [\[PMCID\]](https://pubmed.ncbi.nlm.nih.gov/16770700/)
- [5] Basurto Ona X, Osorio D, Bonfill Cosp X. Drug therapy for treating post-dural puncture headache. The Cochrane Database of Systematic Reviews. 2015; 2015(7):CD007887. [\[DOI:10.1002/14651858.CD007887.pub3\]](https://doi.org/10.1002/14651858.CD007887.pub3) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/26250000/) [\[PMCID\]](https://pubmed.ncbi.nlm.nih.gov/26250000/)
- [6] Mosier J, Roper G, Hays D, Guisto J. Sedative dosing of propofol for treatment of migraine headache in the emergency department: A case series. The Western Journal of Emergency Medicine. 2013; 14(6):646-9. [\[DOI:10.5811/westjem.2013.7.18081\]](https://doi.org/10.5811/westjem.2013.7.18081) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/24000000/) [\[PMCID\]](https://pubmed.ncbi.nlm.nih.gov/24000000/)
- [7] Moshtaghion H, Heiranizadeh N, Rahimdel A, Esmaeili A, Hashemian H, Hekmatmoghadam S. The efficacy of propofol vs. subcutaneous sumatriptan for treatment of acute migraine headaches in the emergency department: A double-blinded clinical trial. Pain Practice. 2015; 15(8):701-5. [\[DOI:10.1111/papr.12230\]](https://doi.org/10.1111/papr.12230) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/26040000/)
- [8] Soleimanpour H, Ghafouri RR, Taheraghdam A, Aghamohammadi D, Negargar S, Golzari SEJ, et al. Effectiveness of intravenous dexamethasone versus propofol for pain relief in the migraine headache: A prospective double blind randomized clinical trial. BMC Neurology. 2012; 12:114. [\[DOI:10.1186/1471-2377-12-114\]](https://doi.org/10.1186/1471-2377-12-114) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/22900000/) [\[PMCID\]](https://pubmed.ncbi.nlm.nih.gov/22900000/)
- [9] Giampetro D, Ruiz-Velasco V, Pruett A, Wicklund M, Knipe R. The effect of propofol on chronic headaches in patients undergoing endoscopy. Pain Research and Management. 2018; 2018:6018404. [\[DOI:10.1155/2018/6018404\]](https://doi.org/10.1155/2018/6018404) [\[PMID\]](https://pubmed.ncbi.nlm.nih.gov/29900000/) [\[PMCID\]](https://pubmed.ncbi.nlm.nih.gov/29900000/)

- [10] Massou S, Drissi M, Hatim G, Ibat D, Drissi Kamili N, Atmani M. [Does propofol have effect on postdural puncture headache? (French)]. Annales Françaises d'Anesthésie et de Réanimation. 2008; 27(10):861-2. [\[DOI:10.1016/j.annfar.2008.09.001\]](https://doi.org/10.1016/j.annfar.2008.09.001) [\[PMID\]](#)
- [11] Golfram P, Yari M, Rezaei M, Farhadi K, Mahdavi Jafari R, Lahoourpour A. The effect of intravenous propofol on the incidence of post-dural puncture headache following spinal anesthesia in cesarean section. Journal of Kermanshah University of Medical Sciences. 2016; 20(2):e69698. [\[DOI:10.22110/jkums.v20i2.3262\]](https://doi.org/10.22110/jkums.v20i2.3262)
- [12] Leffert LR. Is insufficient evidence sufficient? Anesthesia and Analgesia. 2019; 129(5):1202-4. [\[DOI:10.1213/ANE.0000000000004437\]](https://doi.org/10.1213/ANE.0000000000004437) [\[PMID\]](#)
- [13] Krusz JC, Scott V, Belanger J. Intravenous propofol: Unique effectiveness in treating intractable migraine. Headache. 2000; 40(3):224-30. [\[DOI:10.1046/j.1526-4610.2000.00032.x\]](https://doi.org/10.1046/j.1526-4610.2000.00032.x) [\[PMID\]](#)
- [14] Anwar MM, Abdel-Rahman MS. Effect of propofol on perception of pain in mice: Mechanisms of action. Comparative Biochemistry and Physiology. Part A: Molecular & Integrative Physiology. 1998; 120(2):249-53. [\[DOI:10.1016/S1095-6433\(98\)00025-7\]](https://doi.org/10.1016/S1095-6433(98)00025-7) [\[PMID\]](#)
- [15] Cobb B, Liu R, Valentine E, Onuoha O. Breastfeeding after anesthesia: A review for anesthesia providers regarding the transfer of medications into breast milk. Translational Perioperative and Pain Medicine. 2015; 1(2):1-7. [\[DOI:10.31480/2330-4871/023\]](https://doi.org/10.31480/2330-4871/023) [\[PMID\]](#) [\[PMCID\]](#)