Journal of Anesthesia & Clinical Research
ISSN: 2155-6148

Ahmed et al., J Anesth Clin Res 2012, 3:11
DOI: 10.4172/2155-6148.1000259

Case Report Open Access

Use of Cosyntropin for Treatment of Refractory Post Dural Puncture Headache (PDPH): Case Report and a Suggested Algorithm

Andaleeb Abrar Ahmed[1]*, Sanjib Adhikary[2], Thomas A.Verbeek[2] and Sonia Vaida[3]

[1]*Resident, Penn State Milton S. Hershey Medical Center, Hershey, PA 17033, USA*
[2]*Assistant Professor of Anesthesiology, Penn State Hershey Medical Center, Hershey, PA, 17033, USA*
[3]*Professor of Anesthesiology, Penn State Hershey Medical Center, Hershey, PA, 17033, USA*

Abstract

Postdural Puncture Headache (PDPH) is a frequent complication of neuraxial blockade. Use of ACTH or its synthetic analogs for the treatment of PDPH has been reported in the literature since 1994. We describe a case of refractory PDPH in a 36 year old female despite two epidural blood patches (EBPs). Evidence-based algorithmic management of PDPH has never been reported in Anesthesiology literature. Based on the available evidence we developed an opinion-based algorithm for management of PDPH. The associated case report highlights the role of ACTH and the importance of algorithmic management of PDPH. We hope to incite a debate within the anesthesiology community on the role of ACTH and the need for evidence-based algorithmic management of PDPH.

Keywords: Postdural puncture headache; Cosyntropin; ACTH; Epidural

Introduction

Postdural puncture headache (PDPH) is an iatrogenic complication of neuraxial blockade. The incidence of PDPH following accidental dural puncture is greater than 50%. The criteria to diagnose PDPH is headache after a dural puncture, which occurs after assuming the upright position and improves with recumbent position with at least one of the following: neck stiffness, tinnitus, photophobia, and nausea. As far as we know, algorithmic management of PDPH has never been reported in Anesthesiology literature. Use of ACTH or its synthetic analogs for the treatment of PDPH has been reported in the literature since 1994. Based on the available literature we developed an opinion–based algorithm for management of PDPH. The associated case report highlights the role of ACTH and the importance of algorithmic management of PDPH.

Case Presentation

A 36 year old female with history of recto-sigmoid cancer (ASA status 2) underwent low anterior resection of rectum, under general anesthesia. Epidural analgesia was attempted preoperatively with a 17 gauge Tuohy needle. Needle was inserted at the T12-L1 interspace via midline approach. The epidural space was located using the loss of resistance to saline technique. Frank CSF leak was noted immediately and hence the needle was withdrawn and reattempted at L1–L2 interspace. CSF drainage was again noted and the procedure was abandoned. Patient underwent surgery uneventfully. On the first postoperative day (14 hours after dural puncture) patient developed severe headache and nausea, triggered by sitting or standing. Physical examination and vital signs were unremarkable. Postdural puncture headache (PDPH) was suspected. IV crystalloids, bed-rest, and IV caffeine were administered without any significant improvement. An epidural blood patch (EBP) was performed with 25 ml of autologous blood, at the L2–L3 interspace. Patient remained supine for several hours after EBP. Patient's headache improved significantly, however on second postoperative day, her symptoms recurred. Intravenous fluids, and IV caffeine, was again administered, along with continued bed rest without any improvement. On third postoperative day, a repeat EBP was performed at the T12-L1 interspace. Patient's symptoms improved with good relief of her headache. She was discharged home on fourth postoperative day. Patient was readmitted on fifth postoperative day with similar, postural fronto-occipital headache, except that it much more severe in intensity. She denied any fever, back pain, numbness, weakness or urinary complaints. Physical/Neurological examination remained unchanged. IV hydration, and IV caffeine was administered in the emergency room without any improvement. She was admitted to the hospital for further evaluation. Neurological consultation, along with MRI of head, neck, and thoracolumbar spine was performed to rule out other differential diagnosis. Contrast-enhanced MRI (Figure 1) showed signs of intracranial hypotension with diffuse pachymeningeal enhancement.

Neurologist concurred with the diagnosis of PDPH. She failed conventional therapy with intravenous hydration, intravenous caffeine infusion, and two EBPs. Patient was reluctant to have another EBP.

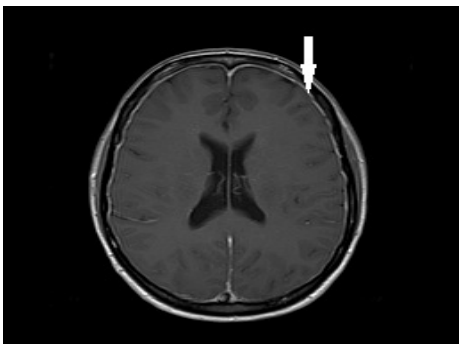

Figure 1: MRI Brain showing diffuse pachymeningeal enhancement (arrow).

***Corresponding author:** Andaleeb Abrar Ahmed, Resident, Penn State Milton S. Hershey Medical Center,500 University Drive, BMR-H187, Hershey, PA 17033, USA, Tel: 001-717-531-5522; Fax: 001-717-531-0826; E-mail: aahmed3@hmc.psu.edu

Received September 10, 2012; **Accepted** October 09, 2012; **Published** October 27, 2012

Citation: Ahmed AA, Adhikary S, Verbeek TA, Vaida S (2012) Use of Cosyntropin for Treatment of Refractory Post Dural Puncture Headache (PDPH): Case Report and a Suggested Algorithm. J Anesth Clin Res 3:259. doi:10.4172/2155-6148.1000259

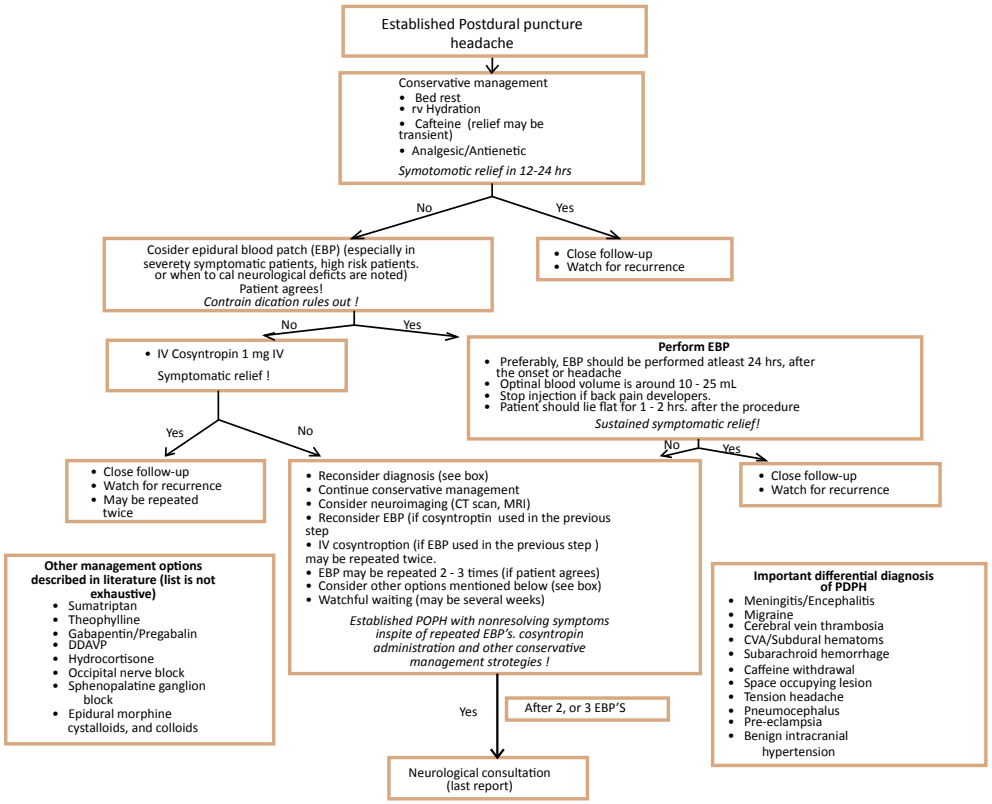

Figure 2: Algorithm for management of Postdural puncture headache (PDPH).

Based on the existing evidence, a decision was made to treat her with cosyntropin (synthetic analog of ACTH). 1 mg of cosyntropin was administered intravenously over 5 minutes. She had 70% relief of her headache (pain score decreased from 10 to 3) within 6 hours. Same dose of cosyntropin was again repeated after 12 hours with complete resolution of her symptoms. Patient was discharged from the hospital on eight postoperative days. She was contacted by telephone 5 days after discharge, and she remained asymptomatic.

Discussion

Postdural puncture headache (PDPH) is an iatrogenic complication of neuraxial blockade and lumbar punctures. According to International Headache Society [1], the criteria for PDPH include a headache that develops after a dural puncture, occurs or worsens after assuming the upright position, and improves with recumbent position with at least one of the following (neck stiffness, tinnitus, photophobia, and nausea). The incidence of PDPH following accidental dural puncture is estimated to be greater than 50% [2]. Factors associated with the development of PDPH includes needle size and type, operator experience, young females, parturient, low BMI, loss of resistance to air, intermittent pressure technique, bevel orientation, and stylet replacement [3]. Most PDPH will resolve spontaneously. Conservative management (Bed rest, hydration, and analgesics) usually resolves majority of headaches [4]. Evidence-based guidelines for management of refractory PDPH are lacking because of limited number of well-designed, randomized trials [5]. Among invasive strategies, epidural blood patches (EBP) is widely used for PDPH relief [6]. It involves injecting autologous blood into epidural space. EBP has the potential to cause serious complications. Management of PDPH varies widely [7], and can be divided broadly into two categories: Conservative management, and invasive management. Wide variety of pharmacological agents has been used without substantial evidence. Caffeine is a widely used pharmacological agent for the management of PDPH. Well designed, randomized trials to show its efficacy are lacking [2]. Epidural blood patch (EBP) [5] remains the main stay for the treatment of PDPH. It involves injecting autologous blood (usually drawn simultaneously from the arm) into the epidural space. EBP has an overall success rate of 61–75%, even though over 90% of patients achieve initial symptom relief. 29–40% may require a second EBP.

Use of ACTH or its synthetic analogs for the treatment of PDPH has been reported in the literature since 1994. Besides anecdotal reports [8-10], three case series [11-13] including a total of 108 patients, reported an efficacy of 70 to 95% with ACTH, or its analogs. Two randomized trials [14,15] have been reported so far with conflicting results. Different analogs, doses, and routes of administration of ACTH have been reported for the management of PDPH. One of the trials [14] used 1 mg of cosyntropin for the prophylaxis of PDPH. It showed more than 50% reduction in the incidence of PDPH after accidental dural puncture. The need for an EBP was reduced from 30% to 11%. Postulated mechanisms include increased CSF production via sodium channels; aldosterone mediated salt and water retention, and possibly increased β endorphin output. Compared to other less proven agents like sumatriptan, or the ophylline, ACTH remains a valid and safe treatment option for PDPH. As far as we know, algorithmic management of PDPH has never been reported in Anesthesiology literature. Based on the available literature we developed an opinion–based algorithm for management of PDPH (Figure 2). The associated case report highlights the role of ACTH and the importance of

algorithmic management of PDPH. We hope to incite a debate within the medical community on the role of ACTH and the need for evidence–based algorithmic management of PDPH.

References

1. Headache Classification Subcommittee of the International Headache Society (2004) The International Classification of Headache Disorders: 2nd edition. Cephalalgia 24: 9-160.
2. Choi PT, Galinski SE, Takeuchi L, Lucas S, Tamayo C, et al. (2003) PDPH is a common complication of neuraxial blockade in parturients: a meta-analysis of obstetrical studies. Can J Anaesth 50: 460-469.
3. Ahmed SV, Jayawarna C, Jude E (2006) Post lumbar puncture headache: diagnosis and management. Postgrad Med J 82: 713-716.
4. Dripps RD, Vandam LD (1954) Long-term follow-up of patients who received 10,098 spinal anesthetics: failure to discover major neurological sequelae. J Am Med Assoc 156: 1486-1491.
5. Basurto Ona X, Martínez García L, Solà I, Bonfill Cosp X (2011) Drug therapy for treating post-dural puncture headache. Cochrane Database Syst Rev : CD007887.
6. Sandesc D, Lupei MI, Sirbu C, Plavat C, Bedreag O, et al. (2005) Conventional treatment or epidural blood patch for the treatment of different etiologies of post dural puncture headache. Acta Anaesthesiol Belg 56: 265-269.
7. Baysinger CL, Pope JE, Lockhart EM, Mercaldo ND (2011) The management of accidental dural puncture and postdural puncture headache: a North American survey. J Clin Anesth 23: 349-360.
8. Collier BB (1994) Treatment for post dural puncture headache. Br J Anaesth 72: 366-367.
9. Kshatri AM, Foster PA (1997) Adrenocorticotropic hormone infusion as a novel treatment for postdural puncture headache. Reg Anesth 22: 432-434.
10. Carter BL, Pasupuleti R (2000) Use of intravenous cosyntropin in the treatment of postdural puncture headache. Anesthesiology 92: 272-274.
11. Cánovas L, Barros C, Gómez A, Castro M, Castro A (2002) Use of intravenous tetracosactin in the treatment of postdural puncture headache: our experience in forty cases. Anesth Analg 94: 1369.
12. Foster P (1994) ACTH treatment for post-lumbar puncture headache. Br J Anaesth 73: 429.
13. Gupta S, Agrawal A (1997) Postdural puncture headache and ACTH. J Clin Anesth 9: 258.
14. Hakim SM (2010) Cosyntropin for prophylaxis against postdural puncture headache after accidental dural puncture. Anesthesiology 113: 413-420.
15. Rucklidge MW, Yentis SM, Paech MJ (2004) Synacthen Depot for the treatment of postdural puncture headache. Anaesthesia 59: 138-141.