Pregabalin for refractory postdural puncture headache

To the Editor,

Postdural puncture headache (PDPH) is a complication following dural puncture. Incidence varies from 0.3% to 20% following spinal anesthesia and about 70% after an accidental dural puncture.[1] Symptoms develop within 48 h to 5 days after the procedure. In 70%, the headache resolves in a week, and in 87% of cases, it resolves within 6 months or it takes 6 months to resolve.[2] PDPH persisting longer than 6 months, however, has been documented.[3] PDPH can be severe and incapacitating, delay recovery and discharge from hospital adding to the cost of treatment. We report a case of severe PDPH refractory to conventional treatment that responded to the use of pregabalin.

A 33-year-old female, a known case of pulmonary hypertension diagnosed with carcinoma of the stomach, was scheduled for partial gastrectomy under general anesthesia. She was on treatment with tablet bosentan, a dual endothelin receptor antagonist in a dose of 62.5 mg twice daily and tablet frusemide 20 mg once daily. An echocardiogram revealed a pulmonary arterial systolic pressure of 54.9 mmHg, dilated cardiac chambers, mild mitral regurgitation and an ejection fraction of 60%.

A 20G, thoracic epidural catheter was inserted for perioperative analgesia. An accidental dural puncture resulted in the T8-T9

interspace with an 18G Tuohy needle (Portex) at first attempt. The catheter was successfully inserted thereafter in the T7-T8 interspace. Intraoperatively, an epidural infusion of 0.125% bupivacaine and 2 mcg/ml fentanyl at 5 mL/h was started and continued postoperatively at 6 mL/h. On 1st postoperative day, the patient complained of a headache in the fronto-occipital region, which she rated as six on the numerical rating scale (NRS), worse on sitting, not associated with nausea, vomiting, tinnitus, hearing loss, neck stiffness or fever. She was started on intravenous paracetamol, 1 g and intravenous diclofenac potassium 50 mg thrice daily with judicious intravenous fluids. Once allowed oral liquids, she was advised 3-4 cups of coffee/day, one tablet paracetamol 650 mg with 50 mg caffeine, 4 times a day and plenty of oral fluids. The intensity reduced, but the headache persisted. On 6th postoperative day, she complained of severe headache (8/10 on the NRS) with tinnitus that appeared on walking. The patient was distressed but not willing for a blood patch.

On 8th postoperative day, the patient's discharge was postponed due to the headache. As a last resort, she was started on tablet pregabalin, 75 mg once only at night. In <12 h, the intensity of the headache reduced significantly, now rated at 3/10.

Over the next 24 h, headache subsided completely, and the patient was discharged on the 10th postoperative day. Pregabalin was continued for 14 days. Patient was asymptomatic on followup at 15 days later.

Postdural puncture headache, an iatrogenic complication of dural puncture is related to the size of the needle. A 100% incidence following an accidental dural puncture with a 17G Tuohy needle and 55.5% incidence with 18 F sprotte epidural needle has been reported.[4] Headache usually develops within 48 h, resolving spontaneously in the majority within 7 days. In some however, it could last longer. PDPH is characterized by severe, dull, nonthrobbing pain, usually fronto-occipital, aggravated in upright position, diminishing when supine. It may be accompanied by nausea, vomiting, visual or auditory disturbances, exacerbated by head movements. The exact mechanism is unknown. According to the modified Monroe-Kelly theory, a reciprocal relationship between cerebrospinal fluid (CSF) and intracranial blood volume exists, hence a decrease in CSF volume, results in vasodilatation with migraine-like headaches.[5]

Treatment aims at reducing symptoms until the hole in the dura is sealed off. Conservative methods include; bed rest, hydration, analgesics, caffeine, theophylline, 5-HT 1D receptor agonist sumatriptan, methergine, adrenocorticotropic hormone and corticosteroids. An epidural blood patch is an invasive technique with a success rate of 61-75%.[6] It is resorted to when conservative methods fail to relieve symptoms. Back pain, transient paresthesia; radicular pain, temporary cranial nerve palsies, cauda equine syndrome,[7] epidural infection, abscess, late arachnoiditis and a repeat inadvertent dural puncture are possible complications. In oncology patients, there is a theoretical risk of seeding the neuraxis with neoplastic cells[8] also; the patient refused an epidural blood patch. Sumatriptan is a 5-HT1 agonist used in the treatment of migraine and PDPH, has been found to increase pulmonary arterial pressures.[9] Since the patient had moderate pulmonary hypertension, sumatriptan was not an option. For the same reason, intravenous fluids were also administered judiciously. Once she was allowed nasojejunal and oral feeds, plenty of water was administered via this route to optimize hydration.

Pregabalin is a structural analog of gamma-aminobutyric acid and an anticonvulsant. The exact mechanism of action is not known, but it appears to act on the α_2-δ subunit of presynaptic voltage-dependent calcium channels. It binds to the α_2-δ subunit and modulates the calcium influx at the nerve terminals, thereby reducing the release of neurotransmitters like glutamate, noradrenaline, serotonin, dopamine and substance P. Pregabalin has a linear pharmacokinetic profile and rapidly absorbed with peak blood concentrations within 1 h. Bioavailability exceeds 90% and is independent of the dose. The elimination half-life ranges from 5.5 to 6.7 h and is independent of dose and repeated administration. It does not undergo hepatic metabolism and is not bound to plasma proteins. It is excreted, by the kidneys with 98% of the absorbed dose excreted unchanged in the urine.

Pregabalin has been shown to be effective in neuropathic pain, incisional injury, inflammatory injury, formalin-induced injury and in the treatment of anxiety and for sleep modulation. It has been used in doses of 50 mg 8 h[10] and 75 mg twice daily[11] for the treatment of PDPH and found to be effective. Our patient received a capsule of pregabalin in a dose of 75 mg once at night. Within the next 12 h, there was a marked improvement in her headache with complete resolution within 24 h. This case demonstrated that pregabalin in a dose of 75 mg at night could also be effective in relieving the symptoms of PDPH in those who do not respond to conservative management.

Pregabalin in a single dose of 75 mg appears to relieve moderate to severe PDPH. There is, however not enough evidence to prove its efficacy in this situation. Well-defined trials are required to obtain further evidence on this information.

Anamika Yadav, Aparna S Chatterjee, Raghuveersingh Pritamsingh Gehdoo

Department of Anaesthesia, Critical Care and Pain, Tata Memorial Hospital, Mumbai, Maharashtra, India

Address for correspondence: Dr. Aparna Chatterjee, Department of Anaesthesia, Critical Care and Pain, Second Floor, Main Building Tata Memorial Hospital, Dr. E. Borges Marg, Parel, Mumbai - 400 012, Maharashtra, India.
E-mail: aparnasanjay@hotmail.com

References

1. Alam MR, Raheen MR, Iqbal KM, Chowdhury MRA. Headache following spinal anesthesia: A review on recent update. J Bangladesh Coll Phys Surg 2011;29:32-40.
2. Vandam LD, Dripps RD. Long-term follow-up of patients who received 10,098 spinal anesthetics; syndrome of decreased intracranial pressure (headache and ocular and auditory difficulties). J Am Med Assoc 1956;161:586-91.
3. Klepstad P. Relief of postural post dural puncture headache by an epidural blood patch 12 months after dural puncture. Acta Anaesthesiol Scand 1999;43:964-6.
4. Morley-Forster PK, Singh S, Angle P, Littleford J, Currin M, Halpern SH. The effect of epidural needle type on postdural puncture headache: A randomized trial. Can J Anaesth 2006;53:572-8.
5. Grant R, Condon B, Hart I, Teasdale GM. Changes in intracranial CSF volume after lumbar puncture and their relationship to post-LP headache. J Neurol Neurosurg Psychiatry 1991;54:440-2.
6. Stride PC, Cooper GM. Dural taps revisited. A 20-year survey from Birmingham Maternity Hospital. Anaesthesia 1993;48:247-55.
7. Diaz JH. Permanent paraparesis and cauda equina syndrome after epidural blood patch for postdural puncture headache. Anesthesiology 2002;96:1515-7.
8. Sagadai S, Rajendran G. Postdural puncture headache. NHS evidence-surgery, anesthesia, perioperative and critical care. [Published September 2010]. Available from: http://www.library.nhs.uk/theatres/viewResource.aspx.
9. MacIntyre PD, Bhargava B, Hogg KJ, Gemmill JD, Hillis WS. Effect of subcutaneous sumatriptan, a selective 5HT1 agonist, on the systemic, pulmonary, and coronary circulation. Circulation 1993;87:401-5.
10. Zencirci B. Postdural puncture headache and pregabalin. J Pain Res 2010;3:11-4.
11. Huseyinoglu U, Huseyinoglu N, Hamurtekin E, Aygun H, Sulu B. Effect of pregabalin on post-dural-puncture headache following spinal anesthesia and lumbar puncture. J Clin Neurosci 2011;18:1365-8.

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/0970-9185.155163