Intravenous fosphenytoin for acute exacerbation of trigeminal neuralgia: case report and literature review

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Ther Adv Neurol Disord

2015, Vol. 8(4) 187–188

DOI: 10.1177/
1756285615583202

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Introduction

Trigeminal neuralgia is an episodic unilateral facial pain described by patients as a shooting of lancinating pain, or as an electric-shock sensation. It is often provoked by light touch, eating, cold wind, or other sensory stimulus of the trigeminal nerve. Common medications for treatment include carbamazepine, oxcarbazepine, baclofen, lamotrigine, gabapentin, and pregabalin [Zakrzewska and Linskey, 2014]. Scant literature exists regarding other medications that may be effective [Cruccu and Truini, 2013]. We describe a case of refractory trigeminal neuralgia which responded to intravenous fosphenytoin infusion.

Case report

A 53-year-old man with a 10-year history of trigeminal neuralgia presented to the emergency department for intractable facial pain. His pain was in the left lower face in the V2 and V3 distributions, described as an electric-shooting sensation, and was very frequent. His pain was exacerbated by opening his mouth and touching his face, which recently had limited his ability to speak and eat. He reported that his pain was a 10/10 on the pain scale. The patient had a grossly unremarkable neurological examination, but would not open his mouth or speak due to increased pain. He presented from the oral surgery clinic after receiving a local anesthetic nerve block at the left mental, nasopalatine, infra-oral, and buccal nerves just hours prior, but without relief of symptoms. Previous nerve-block injections had successfully reduced his pain.

Treatment of the patient's trigeminal neuralgia consisted of lamotrigine 150 mg three times a day for maintenance. However, in the last year, his pain had slowly increased in severity and frequency and

he self titrated to four or five tablets a day. One month prior he saw the oral and maxillofacial surgery clinic and received a local nerve block to the left mental nerve. He was seen in the neurology clinic 2 weeks prior, where carbamazepine 100 mg twice a day was added to the lamotrigine. Local anesthetic nerve blocks by the oral surgery clinic were repeated then to the left buccal and inferior alveolar nerve. He was then seen in the emergency department a few days prior and his carbamazepine was increased to 200 mg twice a day. Subsequently in a general medicine urgent care clinic gabapentin was added at 100 mg three times a day. Two days prior to our seeing him in our emergency department, he received a nerve block at the left inferior alveolar, lingual, buccal, mental, and infraorbital nerves. The patient missed a few days of lamotrigine prior to presenting to the emergency room as he had run out and his refill had not arrived in the mail. Neurology was consulted and a decision was made to load with 15 mg/kg of intravenous fosphenytoin (total 1000 mg over 30 min) to break the current cycle of pain. After the infusion, the patient rated his pain 2/10, he was able to speak freely without difficulty, and was discharged home. He was seen in the neurology clinic 20 days later and noted that his pain was controlled with oral medications.

Discussion

Phenytoin is an antiepileptic drug which blocks sodium channels, thereby stabilizing membranes and reducing neuronal excitability. It was first reported as relieving neuropathic pain by Bergouignan, though limited data exist on the efficacy of this medication in the acute setting [Bergouignan, 1942]. Oral anticonvulsants have been used for neuropathic pain. For many the evidence is primarily anecdotal. Gabapentin,

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carbamazepine, lamotrigine, and zonisamide have shown efficacy in treating neuropathic pain [Backonja, 2002]. Interestingly enough, despite being the first anticonvulsant used for neuropathic pain, phenytoin lacks the data to support its use [Backonja, 2002]. The literature suggests carbamazepine as the first choice in the management of trigeminal neuralgia [Sindrup and Jensen, 2002]. Anecdotal evidence exists demonstrating the usefulness of fosphenytoin in acute exacerbations due to intravenous administration [Sindrup and Jensen, 2002].

In a study of neuropathic pain, 20 patients were randomized under a double-blind, placebo-controlled, crossover study in which patients responded to intravenous fosphenytoin infusion compared with placebo [McCleane, 1999]. Diagnoses were lumbar radiculopathy, sacral neuritis, brachial neuritis, digital neuroma, diabetic neuropathy, and cervical radiculopathy; none had trigeminal neuralgia [McCleane, 1999]. One case study reviewed three patients, all of whom had trigeminal neuralgia for years and presented with acute crisis in pain (10 years, 4 years, and 14 years, respectively) [Cheshire, 2001]. A second case report again demonstrated a refractory trigeminal neuralgia patient to intravenous fosphenytoin [Tate *et al.* 2011].

It is important to differentiate the type of pain relief that may be experienced, and the duration. McCleane specifically looked at pain symptoms and noted that not all responded to fosphenytoin; the drug had a predominant effect on the burning, shooting, numbness, sensitivity, and overall pain, but no appreciable effect on paresthesia [McCleane, 1999]. Intravenous fosphenytoin did, however, demonstrate analgesic efficacy in the acute setting, suggesting its usefulness in treatment of neuropathic pain flare-ups [Sindrup and Jensen, 2002; McCleane, 1999; Cheshire, 2001].

Intravenous fosphenytoin is a viable option for an acute exacerbation of not only trigeminal neuralgia, but for other types of neuropathic pain. Caution is

advised as it may only treat specific components of pain, and its effects are only a temporizing measure. This case, however, adds to the anecdotal reports of fosphenytoin's usefulness in an acute exacerbation, and may be considered on a case-by-case basis for trigeminal neuralgia and neuropathic pain.

Conflict of interest statement

The authors report no disclosures of financial or material support.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

- Backonja, M. (2002) Use of anticonvulsants for treatment of neuropathic pain. *Neurology* 59(5 Suppl. 2): S14–S17.
- Bergouignan, M. (1942) Cures heureuses de nevralgies faciales essentielles par le diphenylhydantoinate de soude. *Rev Laryngol Otol Rhinol* 63: 34–41.
- Cheshire, W. (2001) Fosphenytoin: an intravenous option for the management of acute trigeminal neuralgia crisis. *J Pain Symptom Manage* 21: 506–510.
- Cruccu, G. and Truini, A. (2013) Refractory trigeminal neuralgia. Non-surgical treatment options. *CNS Drugs* 27: 91–96.
- McCleane, G. (1999) Intravenous infusion of phenytoin relieves neuropathic pain: a randomized, double-blinded, placebo-controlled, crossover study. *Anesth Analg* 89: 985–988.
- Sindrup, S. and Jensen, T. (2002) Pharmacotherapy of trigeminal neuralgia. *Clin J Pain* 18: 22–27.
- Tate, R., Rubin, L. and Krajewski, K. (2011) Treatment of refractory trigeminal neuralgia with intravenous phenytoin. *Am J Health Syst Pharm* 68: 2059–2061.
- Zakrzewska, J. and Linskey, M. (2014) Trigeminal neuralgia. *BMJ* 348: g474.