Management of spasticity with severe painful myoclonic jerks in an operated case of spinal astrocytoma

INTRODUCTION

Spinal astrocytomas are the second most common spinal cord tumours overall, representing 40% of intramedullary tumours.[1] The peak incidence of spinal astrocytomas occurs in the third decade, with mean age at presentation being 29 years. Males are affected more commonly than females (male:female 3:2).[2]

Spasticity is a common, but not an inevitable sequel, associated with damage or dysfunction of the upper motor neuron pathway within the central nervous system. It is characterised by spasms, stiffness, clonus, and pain, all of which have functional consequences. Recent evidence suggests that spasticity has many potential pathophysiological mechanisms and is clearly influenced by multiple afferent (cutaneous and proprioceptive) pathways.[3]

Intrathecal baclofen is indicated in spasticity of either cerebral or spinal origin.[4] It is indicated in patients with severe spasticity who are unresponsive to oral baclofen and other drugs.

CASE REPORT

A 79-year-old female patient, with a history of hypertension, diabetes mellitus, hypothyroidism and weighing about 55 kg, was operated for spinal astrocytoma. She presented with complaints of persistent flexor spasm with intermittent bouts of pain and cramps in lower limbs, of 1-month duration. Patient was conscious, coherent and well oriented with mild left facial weakness and paraparaparesis. Vitals were stable except for blood pressure which was 160/94 mmHg. Power in the lower limbs was Grades I-II. Hypertonicity (Ashworth scale 3) and hyper-reflexia were observed in lower limbs. Computerised tomography findings revealed post-operative changes in the lower dorsal and lumbar vertebrae.

Patient-controlled analgesia with intravenous fentanyl infusion was started along with tablet gabapentin 100 mg tds and tablet baclofen 30 mg/day gradually increasing it to 70 mg/day. Once her symptoms subsided, she was discharged with diclofenac patch, tablet baclofen 70 mg/day and gabapentin 300 mg/day. After 15 days she got readmitted with similar complaints of flexor spasms and myoclonic jerks. Because of her age and other factors, oral baclofen dose was not increased. Intrathecal baclofen 50 mcg was administered on a trial basis and patient was observed for 24 h. With improvement in Ashworth scale from 3 to 0, we planned for intrathecal catheterisation and connection to a baclofen pump. Under strict aseptic precautions and with fluoroscopy guidance, lumbar puncture was performed at L3-L4 and catheter passed up to T10-T11. Implantation involved placement of the baclofen pump subcutaneously in the abdomen and the catheter tunnelled subcutaneously. Patient was followed-up regularly. Ashworth scale improved from 3 to 0 and her quality of life improved.

DISCUSSION

Astrocytomas (both intracranial and spinal) arise from astrocytic glial cells. In adults, 75% are low-grade neoplasms. High-grade tumours are more likely to demonstrate extensive leptomeningeal spread seen in up to 60% of spinal cord glioblastomas. They present with symptoms of spasticity and painful myoclonic jerks.

The literature reveals that up to 80% of patients with spinal cord injury have spasticity. Nearly 10–15% of patients with spinal spasticity experience unacceptable side-effects or failure of benefits of conventional oral antispasmodic medications. Some workers have reported even 25–35% of such incidence.

Baclofen[5] is a structural analogue of gamma amino-

butryic acid (GABA) with specific affinity for GABA B receptors. It reduces spasticity, by increasing presynaptic inhibition through the hyperpolarisation, preventing the influx of calcium required for the release of neurotransmitters. Post-synaptically it acts by hyperpolarising Ia afferents. The net effect is inhibition of monosynaptic and polysynaptic spinal reflexes.[6] The drug is primarily metabolised in the liver and eliminated through the kidneys. The half-life is approximately 3.5 h. When initiating treatment, 5–10 mg twice per day is generally recommended to assess tolerance. The dose is then increased by 5–10 mg weekly increments with a maximum recommended dose of 80 mg/day.[7] In the present case, oral baclofen 30 mg/day was started initially and increased up to 70 mg/day. But due to drowsiness and poor oral intake, instead of increasing the oral dose further, intrathecal baclofen was tried.

An intrathecal trial was given to assess the response before permanent installation. A 50-mcg[8] dose was injected through a lumbar puncture procedure, and the patient was assessed at 2–4 h for effect. A comprehensive neurological examination was performed before and after injections, and physical occupation therapy was used to assess the patient for potential functional benefit and compared with Ashworth scale. Since the patient responded well with 50 mcg, dose was not increased further. Dosing is highly variable and adjustable, but generally starts with a simple continuous infusion of 100 mcg and is gradually increased by 10–20% until effective spasticity control is obtained. Average dosing is generally between 200 and 400 mcg/day but can be as high as 1500 mcg/day depending on the patient's response. Since Ashworth scale was reduced to 0 from 3 with 50 mcg/day in the present case, infusion was started at the same dose, and gradually with the passage of time dose was increased by assessing her clinical status and comparing it with Ashworth scale every 2 weeks.

The use of an intrathecal delivery system[9] is an excellent choice for many patients. Studies have shown improvement in functional activities such as daily living routine with comfortable body movements and bladder function. However, it requires regular follow-up, because abrupt discontinuation[10] from either failure to take or from the drug running out can lead to acute life-threatening events. Intrathecal baclofen withdrawal is generally considered a medical emergency and will present most commonly with pruritus, increased tone, irritability, severe rhabdomyolysis, multiple organ failure, and death.

CONCLUSION

In cases of the intractable spasm and painful myoclonic jerks where patient fails to improve with oral baclofen the intrathecal baclofen pump serves as a good alternative.

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REFERENCES

1. Chamberlain MC, Tredway TL. Adult primary intradural spinal cord tumors: A review. Curr Neurol Neurosci Rep 2011;11:320-8.
2. Koeller KK, Rosenblum RS, Morrison AL. Neoplasms of the spinal cord and filum terminale: Radiologic-pathologic correlation. Radiographics 2000;20:1721-49.
3. Kumru H, Murillo N, Samso JV, Valls-Sole J, Edwards D, Pelayo R, *et al.* Reduction of spasticity with repetitive transcranial magnetic stimulation in patients with spinal cord injury. Neurorehabil Neural Repair 2010;24:435-41.
4. Bethoux F, Boulis N, McClelland S 3rd, Willis MA, Hussain M, Machado A, *et al.* Use of intrathecal baclofen for treatment of severe spasticity in selected patients with motor neuron disease. Neurorehabil Neural Repair 2013;27:828-33.
5. Rudra A, Chatterjee S, Sengupta S, Iqbal A, Pal S, Wankhede R. The child with cerebral palsy and anaesthesia. Indian J Anaesth 2008;52:397-403.
6. Albright AL. Spastic cerebral palsy, approaches to drug treatment. CNS Drugs 1995;4:17-27.
7. Aydin G, Tomruk S, Keles I, Demir SO, Orkun S. Transcutaneous electrical nerve stimulation versus baclofen in spasticity: Clinical and electrophysiologic comparison. Am J Phys Med Rehabil 2005;84:584-92.
8. Albright AL. Baclofen in the treatment of cerebral palsy. J Child Neurol 1996;11:77-83.
9. Plassat R, Perrouin Verbe B, Menei P, Menegalli D, Mathé JF, Richard I. Treatment of spasticity with intrathecal Baclofen administration: Long-term follow-up, review of 40 patients. Spinal Cord 2004;42:686-93.
10. Bavikatte G, Gaber T. Approach to spasticity in general practice. Br J Med Pract 2009;2:29-34.

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