The long-term analgesic effect of intrathecal baclofen on neuropathic pain in patients with spinal cord injury

Efecto analgésico del baclofeno intratecal a largo plazo sobre el dolor neuropático en pacientes con lesión medular

Dear Editor:

We recently described the short-term analgesic effects of an intrathecal baclofen bolus on neuropathic pain in patients with spinal cord injury.[1] Other studies report significant, sustained relief of neuropathic pain secondary to traumatic or metabolic lesions to peripheral nerves with 3 monthly boluses of 50 μg intrathecal baclofen.[2] Some researchers have described the long-term benefits of intrathecal baclofen for complex regional pain syndrome,[3] postherpetic neuralgia,[4] and chronic pain of different aetiologies.[5] Zuniga et al.[5] report that intrathecal baclofen may relieve chronic pain of central or peripheral origin, and Loubser and Akman[6] describe the analgesic effects of the drug on chronic musculoskeletal pain associated with spasticity but not on neuropathic pain.

Evidence of the long-term analgesic effects of an intrathecal baclofen pump is based on case series exclusively.[4–6] We present the long-term effects of intrathecal baclofen on neuropathic pain in 3 patients with spinal cord injury and severe spasticity who were administered a baclofen bolus test[1] and subsequently underwent pump implantation (see online Supplementary Material). We used the Neuropathic Pain Symptoms Inventory (NPSI) to evaluate the severity of the different types of neuropathic pain and the Brief Pain Inventory (BPI) to study patient perception of the severity of neuropathic pain and its impact on activities of daily living.

Clinical cases

Patient 1

Our first patient was a 55-year-old man with chronic complete spinal cord injury (ASIA Impairment Scale grade A) (Table 1) who reported spontaneous pain and allodynia.

At 6 months, after implantation of an intrathecal baclofen pump, neuropathic pain improved by 70% and BPI scores decreased from 78 to 17 points.

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Patient 2

Our second patient was a 68-year-old man with chronic incomplete spinal cord injury (ASIA Impairment Scale grade C) who presented spontaneous, paroxysmal pain and dysaesthesia. The baclofen bolus test predicted a 100% decrease in neuropathic pain. At 7 months after pump implantation, neuropathic pain had decreased by 60% (BPI).

Patient 3

Our third patient was a 37-year-old man with chronic incomplete spinal cord injury (ASIA Impairment Scale grade D) who presented spontaneous, paroxysmal pain, allodynia, and dysaesthesia. During the baclofen bolus test, the patient was administered physiological saline solution (placebo) and no improvements were observed in neuropathic pain. After implantation of the intrathecal baclofen pump, neuropathic pain improved by 80%.

Continuous infusion of intrathecal baclofen in 3 patients with spinal cord injury had a long-term analgesic effect on all types of neuropathic pain and substantially decreased the impact of the disease on activities of daily living; these effects persisted for several months. In addition to the benefits of this treatment for spasticity, our results suggest that the analgesic effects of intrathecal baclofen bolus treatment may be considered an indicator of positive response of neuropathic pain to an intrathecal baclofen pump. Previous studies suggest that decreased GABAergic tone in patients with spinal cord injury leads to long-term potentiation in nociceptive pathways,[7] which may in turn promote the transmission of nociceptive stimuli. However, we cannot rule out that intrathecal baclofen may have an inhibitory effect in other areas of the central nervous system.[8] In patients with spinal cord injury, an intrathecal baclofen bolus was found to induce changes in quantitative sensory tests and pain-related evoked potentials,[9] which may point to transient compensation of reduced GABAergic inhibition. Considering that continuous infusion of intrathecal baclofen is currently limited to patients with severe spasticity who do not respond to conventional antispastic treatment, no specific recommendations for pain management have been issued to date.[10]

One of the limitations of our study is the lack of a control group or condition (eg, implanting a pump to administer saline solution instead of baclofen, or stopping the pump without informing patients), for obvious ethical reasons. In conclusion, our study shows significant, lasting improvements in neuropathic pain after implantation of an intrathecal baclofen pump in patients with spinal cord injury. Physicians should take into account the possible long-term analgesic effects of intrathecal baclofen and evaluate the need to adjust treatment in patients with refractory neuropathic pain. Randomised, controlled clinical trials including larger samples of patients with spinal cord injury should be conducted to expand our knowledge about the analgesic effects of intrathecal baclofen.

Conflict of interest

The authors do not have any conflict of interest.

Table 1 Demographic and clinical characteristics of our 3 patients, and characteristics of neuropathic pain and spasticity.

Patient	Age at symptom onset	Sex	ASIA	Lesion location	Aetiology	BBT (months after SCI)	ITB pump (months after SCI)	ITB dose	Follow-up (months after ITB pump implantation)	Location of NP	Location of spasticity	Association between NP and spasticity[a]	Severity of spasticity (MAS) ITB pump	
													Before placement	After placement
1	55	Man	A	C6	Traumatic	21	25	265 μg	6	T6-T12, anal	Legs	None	2	0
2	68	Man	C	T11	Non-traumatic	246	249	175 μg	7	Below the knees	Legs	None, but more severe spasticity increases intensity of NP	2.5	0
3	37	Man	D	C4	Traumatic	24	25	600 μg	7	C4-C8	Abdomen and legs	None	4	1

ASIA: American Spinal Injury Association Impairment Scale score; BBT: baclofen bolus test; ITB: intrathecal baclofen; MAS: Modified Ashworth scale; NP: neuropathic pain; SCI: spinal cord injury.

[a] Association between NP and spasticity: pain induced or exacerbated by spasticity.

Supplementary material

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.nrl.2019.09.009.

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Intra-arterial gadolinium as an alternative to iodinated contrast agents in thrombectomy

Gadolinio intraarterial como alternativa al contraste yodado en la trombectomía

Dear Editor:

Thrombectomy has radically changed the management of ischaemic stroke due to large-vessel occlusion.[1] Angiography requires the use of iodinated contrast agents, although gadolinium may be used in patients with a contraindication to these substances. Gadolinium has been used widely in arterial interventions and peripheral angiography.[2] It has also been used in carotid artery angiography,[3,4] in the treatment of dural arteriovenous fistulas,[5] and even in the assessment of patients with ischaemic stroke, when results from non-invasive tests are inconclusive.[6]

Gadolinium-enhanced cerebral angiography for thrombectomy may be an alternative in patients with history of severe adverse reactions to iodinated contrast agents. Although this indication is known, it is rarely mentioned in the literature.[7] We recently treated 2 patients with aspiration thrombectomy using gadolinium as the contrast medium.

The first patient was a 69-year-old woman with hypertension and history of papillary carcinoma of the thyroid, which was treated surgically 20 years previously. She came to our hospital due to language impairment and right limb weakness of 6 hours' progression. The neurological examination revealed severe dysphasia with right faciobrachiocrural hemiparesis, scoring 17 points on the National Institutes of Health Stroke Scale (NIHSS). CT findings scored 8 on the Alberta Stroke Program Early CT Score (ASPECTS), with a hyperdense signal in the left middle cerebral artery; CT angiography was not performed as the patient had presented anaphylaxis to contrast during a follow-up study of the thyroid cancer. Laboratory analysis detected no remarkable alterations, with creatinine clearance of 110 mL/min. Given strong suspicion of large-vessel occlusion, we performed an angiography study with gadobutrol; our patient's relatives gave informed consent for the compassionate use of this contrast medium. The study revealed left distal M1 segment occlusion (Fig. 1). Manual aspiration with a SOFIA 6 F catheter achieved successful recanalisation (TICI grade 3). The procedure required 26 mL Gadovist® (gadobutrol 604.72 mg/mL) for 3 angiography runs, and was performed

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