Impact of Aggressive Palliative Approach to Acute Pain Management In a Young Opioid Naïve Patient: A Case Report

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Introduction

- Most, if not all, Spinal Cord Injury (SCI) patients will develop complications which can impact function and quality of life (QOL), with pain being one of the most common.
- Acute post-traumatic pain in SCI can be a combination of nociceptive (NC) & neuropathic (NP) pain and it is prevalent in 60% to 80% of SCI.
- In the acute phase, pain is commonly located at site of vertebral fracture. NP may develop soon after cord injury (Guidelines)
- Pain management in SCI patients can be specifically challenging, as it can be refractory to pharmacologic treatments that are effective in non-SCI patients.
- Pharmacologic agents include anticonvulsants, antidepressants and opioids although it is key to find a balance between CNS related side effects and pain relief.

Case Description

A 33-year-old opioid naive female patient with past history of anxiety and depression, sustained a motor vehicle accident (MVA) resulting in C6 vertebral fracture and acute cord compression requiring emergent cervical decompression and fusion. She was classified as a Traumatic C4 AIS D Incomplete Tetraplegia. Postoperative course was complicated by intractable pain which was managed by Palliative Care. Due to her complaint of continuous neck pain radiating into her upper and lower extremities, within 5 days of injury, she was placed on maximum dose of Pregabalin (200mg three times a day), 50mg of Amitriptyline at bedtime, Methadone 5mg twice a day, Cyclobenzaprine 10mg three times a day and 7.5mg to 15mg of immediate release Morphine Sulfate every 4 hours for moderate to severe pain as needed for which the patient was using around the clock. On admission to our acute inpatient rehabilitation facility (IRF), she presented with uncontrolled pain, hyperalgesia, irritability, impulsivity, decreased cooperation and labile mood. Efforts were taken to wean her from this aggressive pain regimen to a much more conservative one, although on her 2nd night she left against medical advice without any prescriptions/medications. She was later re-admitted to the our IRF 3 days later, presenting much more coherent, cooperative, and rational. During this stay, she continued to complain of pain, although pain control was obtained with Tramadol 50mg every 6 hours as needed, Gabapentin titrated to 400mg every 8 hours and directed-therapy for her spasticity with Baclofen 10mg three times a day, Tizanidine 5mg at bedtime and Diazepam 5mg at bedtime. Of note, prior to admission and MVA, she was already taking high dose of Venlafaxine XR (150mg twice a day) for her anxiety and depression, which was being managed by her psychiatrist. After these adjustments, she was able to complete her comprehensive IRF program which lasted 3 weeks, with improvement in her functional outcomes as well as her pain control.

Discussion

- Acute post traumatic pain can be challenging to treat, especially in the SCI population, due to a combination of nociceptive and neuropathic pain, and our patient was no exception.
- This patient was aggressively treated resulting in multiple side effects affecting her cognition, emotional state, participation in therapy and resulting in a state of hyperalgesia. After adjustments to her post-op pain management regimen, our patient was able to complete a 3 week IRF program with improvement in her functional status and pain control.
- While opioids remain part of the options of pain management for moderate to severe pain, studies have shown that a stepwise multimodal approach using lowest effective doses of analgesics with multiple mechanisms of action provides better pain relief with reduced consumption of opioids, with superior tolerability and improved side effect profile.
- This case supports our opinion that acute post traumatic pain should be managed ideally by pain specialists in the field of Physical Medicine & Rehabilitation instead of Hospice/Palliative Care service to avoid aggressive or inappropriate management especially in opioid naïve patients.

Pain Management in SCI

	Intervention	Mechanism of Action	Dosage	Adverse Effects
1st Line	Pregabalin	Bind to Voltage-gated Ca^{2+} channel in CNS modulating Ca^{2+} influx in nerve terminals. Inhibit release of Glutamate, NE, 5HT, DA & Subs. P	75mg BID (increase in 1 week if tolerable to 150mg BID. After 2-4 weeks can be increased to 600mg/day)	Somnolence, Dizziness, Dry mouth, Weight gain
	Gabapentin	Bind to Voltage-gated Ca^{2+} channel in CNS modulating Ca^{2+} influx in nerve terminals.	100-300mg daily to TID. Can increase up to 3600mg/daily	Somnolence, Dizziness, fatigue, ataxia
	Amitriptyline	Increase 5HT & NE concentration in synapse by inhibiting their reuptake of the presynaptic membrane pump	Initial 10-25mg daily. Increase weekly in increments of 10-25mg up to 150mg/daily (either daily or divided BID dosing)	Cardiac Arrhythmias, Dry mouth, Urinary Retention, Somnolence, AMS
2nd Line	Tramadol	Opioid receptor agonist (mu & delta); NE & 5HT reuptake blocker	Initial 50mg daily or BID and titrated up to 400mg/daily divided into 4 doses.	Somnolence, Nausea, Constipation; Increase risk of Serotonin Syndrome if used w/ monoaminergic drugs (i.e.. TCA)
	Lamotrigine	Inhibit release of Glutamate; Inhibit Voltage-gated Na channels	Titrated to a max of 400mg/day	Somnolence, Rash (Black-Box Warning: Steven-Johnson Syndrome), Headaches, Nausea.
3rd Line	tDCS			Skin irritation, visual disturbances
	VI			Headaches, fatigue
4th Line	Oxycodone	Opioid receptor agonist (mu, kappa, delta)	5-15mg every 4-6 hours (For opioid naïve patients, start at lower dose)	Sedation, nausea, vomiting,

Conclusion

- Pain is a common complication in patients with SCI and can impair quality of life. It is important to involve a multidisciplinary team to approach each patient's pain. It is imperative for every physician to not only understand the type of pain, but also the timing and the context in order to prescribe an appropriate pain management regimen including pharmacological and non-pharmacological approaches keeping in mind the ethical principles of beneficence and first do no harm.
- Adequate pain control has become an area of interest, especially now due to the ongoing opioid crisis. Due to this, multimodal approaches and guidelines have been developed (i.e.. CanPain guidelines for management of neuropathic pain in Table 1) to improve patient's satisfaction and reduce the unsafe use of aggressive interventions like opioids.

References

Scheuren, P. S., Gagné, M., Jutzeler, C. R., Rosner, J., Mercier, C., & Kramer, J. (2019). Tracking Changes in Neuropathic Pain After Acute Spinal Cord Injury. *Frontiers in neurology*, *10*, 90. https://doi.org/10.3389/fneur.2019.00090
Wong, T. K., Alexander, M. S., New, P. W., Delgado, A. D., & Bryce, T. N. (2019). Pulse article: opioid prescription for pain after spinal cord damage (SCD), differences from recommended guidelines, and a proposed algorithm for the use of opioids for pain after SCD. *Spinal cord series and cases*, *5*, 39. https://doi.org/10.1038/s41394-019-0189-5
Craven, B. C., Finnerup, N. B., Harvey, D., Hitzig, S. L., Lau, B., Middleton, J. W., O'Connell, C., Orenczuk, S., ... Loh, E. (2016). The CanPain SCI Clinical Practice Guidelines for Rehabilitation Management of Neuropathic Pain after Spinal Cord: Recommendations for treatment. *Spinal cord*, *54 Suppl 1*, S14–S23. https://doi.org/10.1038/sc.2016.90
Huang, Q., Duan, W., Sivanesan, E., Liu, S., Yang, F., Chen, Z., Ford, N. C., Chen, X., & Guan, Y. (2019). Spinal Cord Stimulation for Pain Treatment After Spinal Cord Injury. *Neuroscience bulletin*, *35*(3), 527–539. https://doi.org/10.1007/s12264-018-0320-9
Helander, E. M., Menard, B. L., Harmon, C. M., Homra, B. K., Allain, A. V., Bordelon, G. J., . . . Kaye, A. D. (2017). Multimodal Analgesia, Current Concepts, and Acute Pain Considerations. *Current Pain and Headache Reports*, *21*(1). https://doi.org/10.1007/s11916-017-0607-y
Hsu, J. R., Mir, H., Wally, M. K., & Seymour, R. B. (2019). Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury. *Journal of Orthopaedic Trauma*, *33*(5). https://doi.org/10.1097/bot.0000000000001430
Sinatra, R. (2010). Causes and Consequences of Inadequate Management of Acute Pain. *Pain Medicine*, *11*(12), 1859-1871. https://doi.org/10.1111/j.1526-4637.2010.00983.x