Acute Pain Management for a Patient with Chronic Pain Stabilized on buprenorphine-naloxone

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Introduction

For a small percentage of patients suffering from chronic pain, buprenorphine-naloxone (bup-nal) is a useful pharmacologic option (Chen et al, 2014; Alford, Compton, & Samet, 2006). Although buprenorphine was originally developed as an analgesic, using bup-nal for chronic pain management is still off-label in Canada. Instead, bup-nal is more commonly known for its role in treating patients with opioid-use disorder.

From a pharmacological perspective, buprenorphine has a few unique properties which make it ideal for patients suffering from chronic pain. Buprenorphine is a partial agonist at the mu-opioid receptor and tolerance to buprenorphine occurs at a slower rate than other opioids. Additionally, bup-nal can also be used to improve pain in patients suffering from opioid-induced hyperalgesia (Anderson et al, 2017). In addition to its partial agonism, buprenorphine has a high binding affinity for the mu-opioid receptor and has a slow rate of dissociation which yields a more extended duration of action compared to traditional full-agonist opioids (ex: morphine, oxycodone, hydromorphone) (Chen et al, 2014).

One challenge clinicians face is managing bup-nal therapy during acute pain episodes (acute-on-chronic pain). Because buprenorphine has such a high affinity for the mu-opioid receptor, it can block other opioids from working. Unfortunately, there is little published in the literature on managing acute pain in an outpatient setting for patients stabilized on bup-nal for chronic pain and experts remain divided on the ideal approach. Most clinicians recommend discontinuation of the bup-nal prior to a scheduled surgery to eliminate the receptor blockage and then convert to a full agonist during surgery (Anderson et al, 2017; Rajput & Vadivelu, 2021). However, with more urgent surgery this is not always an option. In surgeries with moderate to high levels of postoperative pain where there is no time to stop bup-nal, anesthesiologists usually use higher doses of full mu-agonist therapy during surgery to overcome the high binding affinity (Anderson et al, 2017). However, there is a paucity of information in the literature on how to manage acute-on-chronic pain in an outpatient setting where the post-surgical pain is expected to be mild to moderate.

The following case study describes the experience of a patient stabilized on bup-nal who required urgent dental surgery. This example adds to the literature because it involves managing acute pain in a patient with chronic pain stabilized on bup-nal in an outpatient setting without tapering down the bup-nal, and without adding a full-agonist opioid. We will describe how we managed her post-surgical pain using additional doses of bup-nal for acute pain management.

Case Presentation

HN is a 54-year-old female with chronic pain post mastectomy, stabilized on bup-nal, who was scheduled for urgent dental surgery and needed guidance on how to manage her acute pain following dental surgery.

Patient description: HN is a 54-year-old female followed at a tertiary comprehensive pain program in Toronto for her chronic pain.

Case history: HN's past medical history included breast cancer (2016) treated by mastectomy, hypertension, migraine, gastroesophageal reflux, depression, and fibromyalgia.

Surgical history includes bariatric surgery, hysterectomy, and appendectomy.

When HN was initially assessed at the pain program her pain scores were consistently 8/10 or higher, and brief pain inventory (BPI) functional interference score showed severe interference. HN described her pain as shooting, sharp, gnawing, burning, tender, and tiring. On her body map, HN described her neck, shoulders, entire back, breast, lower extremities as her areas of pain.

Her previous medications include oxycodone-acetaminophen (Percocet), hydromorphone, morphine SR (Kadian), gabapentin (Neurontin), trazodone, duloxetine (Cymbalta), and zopiclone (Imovane). She is unable to take NSAIDS due to history of bariatric surgery.

HN recalled having pain since 2000 and was prescribed opioids on and off, but at that time she described no difficulties weaning off her opioids. However, after her mastectomy, she had difficulty managing her overall pain, which was classified as both nociceptive and nociplastic (pain was centralized). HN attempted to wean off of the opioids but was unsuccessful. Full agonist opioids were not helping and unfortunately were making her pain worse and HN was diagnosed with opioid induced hyperalgesia. Her goal was to eventually wean off opioids again as she recognized that they were not helping reduce her pain and she also knew that opioids are not indicated for fibromyalgia.

In September 2021 she was switched from hydromorphone to bup-nal for chronic pain management. Three weeks post induction, her pain ranged from 6/10-9/10, and BPI functional interference score remained unchanged (severe interference). She reported that bup-nal was helping her manage her pain.

Her current medications included:
- buprenorphine-naloxone 8mg/2mg SL BID
- pregabalin 100mg po BID
- escitalopram 20mg po once daily
- topiramate 50mg po BID
- nabilone 1mg po BID
- acetaminophen 1000mg po q6h

One month later HN was scheduled for dental surgery (tooth extraction). HN called the nurse practitioner (NP) at the clinic with only a few day's notice for the dental procedure, which meant there was no time to wean HN off bup-nal. Her dentist was not sure of how to manage

Table 1. bup-nal dosing for HN after first dental surgery				
	Day 0	Day 1	Day 2	Day 3
Usual bup-nal dose	8mg/2mg SL BID	8mg/2mg SL BID	8mg/2mg SL BID	8mg/2mg SL BID
Additional bup-nal doses	2mg/0.5mg	2 x 2mg/0.5mg	2 x 2mg/0.5mg	2mg/0.5mg
Total bup-nal dose	10mg/2.5mg	12mg/3mg	12mg/3mg	10mg/2.5mg

her pain except that she would need additional pain coverage. After consulting with the team pharmacist (RPh) and physician (MD) regarding reasonable options, the NP decided to increase her daily bup-nal dose to manage HN's acute pain post dental-surgery. The NP prescribed 6 tablets of bup-nal 2mg/0.5mg as needed for acute pain associated with dental surgery (with instruction of no more than 2-3 additional tablets post procedure day). HN took 1 tablet (2mg/0.5mg) SL BID-TID (in addition to her usual dose of bup-nal 8mg/2mg SL BID) and said that she felt that 6 tablets over 2-3 days "was good" (Table 1). HN was using ice as needed, as well as continuing acetaminophen one gram po QID.

HN had another, more extensive, dental surgery scheduled a few weeks later, and the NP prescribed another 6 tablets (bup-nal 2mg/0.5mg) as needed. HN used 3 tablets per day x 2 days and called the pain clinic for more tablets. The NP prescribed another 3 tablets which was enough to manage the acute pain. Of note, HN continued to use ice as needed, as well as acetaminophen one gram po QID.

In December, HN had a third procedure, and the NP prescribed another 6 tablets with similar effect. HN again reported that 6 tablets over 2-3 days was sufficient to manage her pain post-dental procedure.

Discussion

While there have been reports in the literature that describe increasing daily bup-nal for a few days post-surgery as an option for acute pain management, we had little experience with this aproach at our clinic (Anderson et al, 2017). This strategy was efficacious, safe, and straightforward for the patient.

From an efficacy perspective, temporarily increasing HN's daily bup-nal dose for 3 days post-surgery addressed her acute pain. It is of the utmost importance to use shared decision-making principles with our patients and to be open to guidance regarding additional doses. (Matthias, Talib, & Huffman, 2020) In this case, temporarily increasing the overall bup-nal dose addressed HN's acute pain.

In addition, the importance of collaboration with other healthcare providers can't be understated. The dentist was aware of the plan and was able to optimize non-opioid treatments during surgery (for example giving longer/deeper freezing).

From a safety perspective, this plan did not result in a disruption of HN's chronic bup-nal therapy, which was very important to her and simplified the number of steps by the multiple players of the health care team. HN did not have to undergo withdrawal by decreasing the bup-nal and using a full-agonist opioid (which would have been used if the patient was not already taking bup-nal). Additionally, the NP didn't have to prescribe a full-agonist opioid to be taken on top of the bup-nal, which could have heightened the risk for opioid poisoning and other side effects. With this plan, HN didn't experience any side effects with the temporary increased dose of bup-nal.

Finally, the plan was straighforward for the NP to execute, and simple for HN to follow. Our team had concerns about safety in an outpatient setting. If, for example, the team suggested to start a low dose of hydromorphone (0.5mg), the hydromorphone could not fully displace the buprenorphine and the hydromorphone would have not had much effect. This is because of the tight binding of buprenorphine at the mu receptor, which leads to reduced analgesia. This tight binding can be overcome with increased doses of a full-agonist opioid; however, the amount of full-agonist opioid to give in addition to buprenorphine is very individual, and unsafe to titrate without close supervision from a health-care professional (for example, in an in-patient setting) (Kornfeld & Manfredi, 2010). In this case the patient might take more doses to get pain relief, which could increase the risk of opioid poisoning or adverse effects such as nausea, vomiting, or drowsiness. The other, most complicated option, would be to fully stop bup-nal for the surgery, but this would have led to a disruption of analgesia for the patient, the need for another bup-nal induction once the full-agonist opioid was cleared from her body, and would have been much more complicated for the patient and the team. The fact that the NP created a simple and easy-to-follow plan for HN allowed HN to undergo subsequent surgeries safely and with confidence.

Conclusion

For patients with chronic pain stabilized on bup-nal, adequate pain management can be achieved through continuing baseline bup-nal therapy and adding on 2-3 'extra' doses of bup-nal per day for the first few days post-surgery. Importantly, this additional bup-nal dose was supplemented with multi-modal therapies (example: ice, acetaminophen, rest).

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