



Combined Perineural Dexamethasone and Clonidine Prolong Analgesic Duration of a Supraclavicular Block in a Patient with Severe Oncological Pain

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Case Report

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Abstract

There are a lot of studies reporting the beneficial effects of adjuvants in regional anesthesia, but a few of them were performed in patients with chronic cancer pain. The treatment of this condition represents a high cost for the health system, and a major challenge for the physicians. We describe the use of combined perineural clonidine and dexamethasone as adjuvants for the prolongation of the analgesic effect of a supraclavicular brachial plexus block in a patient with severe chronic cancer pain by an anaplastic large cell lymphoma compromising the axilla and the arm.

Keywords: Regional anesthesia; Adjuvants; Cancer Pain; Clonidine; Dexamethasone

Introduction

Cancer-related chronic pain management represents one of the most challenging problems for physicians and a huge cost to the health system. Cancer survival is becoming more and more frequent due to the development of new and more effective treatment options. However, many survivors must cope with significant long-term or late effects of cancer and its treatment, including pain. There are a variety of options for the treatment of chronic pain, including medication and interventional techniques. In the last group, regional anesthesia, including neuraxial and peripheral nerve plexus blocks are standard interventions in the treatment of chronic pain. For peripheral nerve plexus blocks there are several studies regarding the use of adjuvants drugs to prolong the duration of the analgesic effect of local anesthetics (LA). The most frequently used drugs to achieve this goal are dexamethasone and alpha 2 agonists, such as clonidine and dexmedetomidine. Despite the use of adjuvants, these techniques usually provide analgesia only during the first two days after the block is performed [1-4].

Case Description

We present a 35 years old male patient suffering from severe neuropathic pain due to an anaplastic large cell lymphoma comprising the axilla with a usual pain score of 10/10 and allodynia in right upper extremity despite the intake of numerous analgesic drugs. His analgesic scheme was tramadol 50 mg every 6 hours, acetaminophen 1 gr every 8 hours, diclofenac 50 mg every 8 hours, pregabalin 75 mg daily and clonazepam 0,5 mg twice a day. After several failed attempts to perform an angio-MRI because of impossibility to adopt and maintain the right position due to excruciating pain, the patient came to our institution in order to proceed with the study under general anesthesia. He was informed about the possible risks and benefits of regional anesthesia and he agreed to a right supraclavicular block (SCB). He also gave his consent to publish this report. An IV access and routine monitors were placed before performing an ultrasound guided right supraclavicular brachial plexus block injecting 20 cc of 0,2% ropivacaine with 4 mg of preservative-free dexamethasone and 100 ug of preservative-

free clonidine. Ten minutes later, sensory and motor blockade was established. Then, we proceeded with general anesthesia with 200 mg of propofol, 150 ug of fentanyl and sevoflurane 1%. A laryngeal mask was placed and spontaneous breathing was maintained throughout the procedure. After emerging from general anesthesia, the patient referred pain 3/10 with impossibility to move his arm. The analgesic effect of this procedure lasted 5 days. During that period the pain was rated 4/10 for the first day, 1/10 for the 2nd and 3rd days and 4/10 for the 4th and 5th days. He continued taking his medications in the same dose and frequency. On the 6th day, the patient referred an unbearable pain along with a burning sensation from the axilla to the tip of his fingers which led to increase his oral opioid frequency to four times daily and duplicate the dose. On the 7th day he finally was admitted at the emergency department for IV analgesia and completing his staging studies in order to start chemotherapy.

Discussion

The supraclavicular plexus block has fast onset and provides anesthesia to the entire ipsilateral upper extremity which is why it is also called “the upper limb spinal block”. However, a major limitation of peripheral nerve blocks is the short duration of action of LA. The use of perineural adjuvants has been proposed to overcome this limitation, including dexamethasone and alpha-2 agonists such as clonidine and dexmedetomidine.

A meta-analysis showed that the use of perineural dexamethasone along with LA (ropivacaine or bupivacaine) prolonged analgesia duration for over 10 hours resulting in decreased postoperative opioid consumption [5]. In other study the addition of dexamethasone to LA significantly and safely prolonged the duration of sensory block in an axillary brachial plexus block compared to control (242 min versus 98 min, respectively) [6]. The reason why dexamethasone prolongs the action of local anesthetics remains poorly understood and is very likely multifactorial. Two proposed mechanisms are corticosteroid induced vasoconstriction reducing local anesthetic absorption and the inhibition of potassium channels on nociceptive C-fibers, which could prolong analgesia up to 48 h [7]. Clonidine and dexmedetomidine are alpha-2 agonists often used as adjuvants in regional anesthesia in order to enhance the effect of LA. The mechanism by which alpha-2 agonists are able to achieve it may be through inhibition of nociceptive C-fibers through hyperpolarization-activated cation currents. A meta-analysis of randomized controlled trials demonstrated that the addition of clonidine to LA, prolonged the duration of postoperative analgesia (weighted mean difference 122 min; 95% confidence interval [CI] 74-169), sensory block (weighted mean difference 74 min; 95% CI 37-111), and motor block (weighted mean difference 141 min;

95% CI 82-199) compared to LA alone [8]. Other studies concluded that clonidine as an adjuvant to LA significantly enhances the quality of supraclavicular brachial plexus block by faster onset, prolonged duration of sensory and motor block and improved postoperative analgesia, without associated adverse effects [9,10]. One study demonstrates that both clonidine and dexamethasone significantly increased block duration by 1.1 and 3.0 hours, respectively. Combining clonidine and dexamethasone with ropivacaine increased block duration by 6.2 hours when compared to ropivacaine alone. Dexamethasone and Clonidine increased block duration by 5.2 hours when compared to clonidine alone and by 3.2 hours compared to dexamethasone alone [11]. There are several studies demonstrating improvement of onset time, quality and duration of analgesia with the use of dexmedetomidine vs. clonidine. However, these benefits should be weighed against increased risk of motor block prolongation and transient bradycardia and hypotension [12-15].

Conclusion

We describe a supraclavicular block using a combination of clonidine and dexamethasone obtaining a significantly prolonged analgesia of the extremity. We used clonidine instead of dexmedetomidine because it presents fewer incidences of bradycardia and hypotension as well as lower cost. Both dexamethasone and clonidine individually have demonstrated prolongation of LA duration of action in brachial plexus blocks. To the best of our knowledge this is the first report of a supraclavicular brachial plexus block using clonidine and dexamethasone as adjuvants to LA for the treatment of oncological pain.

There is a report describing the use of dexamethasone and dexmedetomidine associated to ropivacaine in a combined superficial and deep serratus plane block for the treatment of postmastectomy chronic pain syndrome. They reported an analgesic effect duration of 30 days [16]. In our case, analgesia lasted 5 days with no adverse effect. Further large studies are needed to assess the safety, efficacy and optimal doses of perineural adjuvants to local anesthetic in the treatment of chronic oncological pain.

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