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Combined Use of Intrathecal Opioids and Dexmedetomidine in the Management of Neuropathic Pain

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LETTERS TO EDITORS

We have read with curiosity the enrapturing article entitled, "Safe Sedation and Hypnosis using Dexmedetomidine for Minimally Invasive Spine Surgery in a Prone Position," published in the *Korean Journal of Pain* [1]. Kim skillfully reviewed the literature on the mechanisms of action as well as the pharmacokinetics and pharmacodynamics of dexmedetomidine and its potential role in the management of pain during minimally invasive spine surgery (MISS). This article is a helpful review which attempts to resolve interpretations of the hypnotic surgical condition and the ideal sedative role of dexmedetomidine during MISS in a prone position. However, we would like to add some additional points with regard to the potential role of opioids with dexmedetomidine, administered intrathecally, in mitigating neuropathic pain, as presented below.

The spinal cord is the fundamental neuronal structure which conducts pain signals, and nociception can be decreased by serotonin, norepinephrine, and with local opioids. Thus, interaction between these systems can affect antinociception at the level of the spinal cord. Moreover, the spinal cord is an important pharmacological site of action for different drugs which have antinociceptive effects [2]. On the other hand, an intrathecal administration of narcotics is widely used for postoperative and post-labor nociceptive pain. Nevertheless, opioids, administrated intrathecally, have not been used extensively in patients with neuropathic pain. This lack of experience may be due to the poor outcomes of oral or parenteral opioids in the management of neuropathic pain syndrome. In addition, opioid therapy is limited due to intolerance and as a result of its side effects (e.g., pruritus, respiratory depression, hypotension, urinary retention, nausea) [3].

The antinociceptive effects of intrathecal opioids are enhanced by spinal alpha 2-adrenoceptor activation. Alpha 2-adrenoceptor-mediated spinal analgesia has been widely investigated in human and animal studies [4]. Dexmedetomidine is a potent and highly selective alpha 2-adrenoceptor agonist. Although dexmedetomidine has a number of undesirable side effects (diuresis, mydriasis, and sedation), intrathecal administration of dexmedetomidine has antinociceptive effects in animals [5]. Hence, a combination of several agents that produce synergistic interactions or similar therapeutic effects may also attenuate the undesired effects by permitting a diminution dose of individual

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agents to be administered. In a recent experimental model of neuropathic pain, intrathecal dexmedetomidine and morphine in combination appeared to be effective analgesics [6].

As is clear from the above discussion, the combined use of intrathecal dexmedetomidine and opioids may play a fundamental role in mitigating neuropathic pain. However, human studies are required for a deeper understanding of this topic.

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