

## Use of Nefopam in Perioperative Pain Management; Keeping Nefopam in between

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Without mentioning chronic pain, acute postoperative pain has been regarded as a matter of great concern to patients as well as physicians. The 'Pain as the Fifth Vital Sign' initiative may have helped make its control of primary importance in the perioperative management of surgical patients [1]. Extensive literature has demonstrated the benefits of effective postoperative pain control including improved surgical outcome, reduced hospital stays and decreased development of new chronic pain conditions [2-4]. However, the main analgesics for acute pain, opioids, may be associated with several side effects such as somnolence, confusion, urinary retention, ileus, respiratory depression, and death in case of misuse or overuse. Therefore, multimodal analgesia combining opioid and non-opioid analgesics is preferred for postoperative pain management [5].

Nefopam has been used for acute moderate pain since the mid-1970s as a centrally acting non-opioid analgesic. It was found to have several analgesic mechanisms including inhibition of monoamine uptake resulting in an increase of the inhibitory tone of the serotonergic and nor-epinephrine descending pathway, and reduced glutaminergic transmission by decreasing the activation of postsynaptic glutamatergic receptors. Owing to the multi-

ple analgesic mechanisms of nefopam, animal and clinical researches were performed to examine the analgesic interaction with other drugs including opioids. Several reports were also published in the Korean Journal of Pain regarding its mechanism and drug interaction, proposing the use of nefopam for multimodal analgesia for postoperative pain [6-8].

In addition to its analgesic effect, it also reduces postoperative shivering, making it favorable for perioperative use. Given that postoperative pain is acute nociceptive, inflammatory and even neuropathic in nature, the multimodal analgesic technique could be more effective and suitable for postoperative pain management. Some studies revealed the potential of nefopam as an analgesic for neuropathic pain [9-11]. As already reported, the preoperative administration of gabapentin and pregabalin decreased opioid consumption in a setting of postoperative pain. Therefore, it appears that pre- or intraoperative administration of nefopam could be a plausible approach for preventing postoperative shivering and reducing opioid consumption [12].

Despite the above mentioned properties favoring nefopam for perioperative use, adverse effects such as confusion and tachycardia have been well noted. Furthermore, unexpected side effects including neuropsychiatric (related

Received March 16, 2016. Accepted March 24, 2016.

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with abuse), cutaneous, or anaphylactic reactions have been reported [13,14]. Therefore, extensive use of nefopam in the perioperative period should wait until further research establishes the safety of the intraoperative use of nefopam, defines the analgesic mechanisms, and provides good quality strategies for nefopam in the multimodal analgesic approach. Also, it should be kept in mind that for whatever reason nefopam is not available in the United States.

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