

Effect of preoperative pregabalin in video-assisted thoracoscopic surgery

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Severe postoperative pain develops with high frequency in 40–80% of patients after thoracic surgery (1-4). The pain is usually caused by factors such as inflammation of the pleura, intercostal damage, and iatrogenic rib fracture (5). Postoperative pain consists of nociceptive pain and neuropathic pain (6). Nociceptive pain is the pain derived from stimulation of nociceptors due to inflammation caused by surgical procedures such as incisions and sutures. It has been known that nociceptive pain can be effectively treated with NSAIDs (6). On the other hand, neuropathic pain occurs due to intercostal nerve damage. Epidural blocks, which block nerve circuits, and pregabalin, which suppresses release of neurotransmitters by binding to Ca²⁺ channels at the presynapse of the nerve, are known to be effective to treat neuropathic pain (3,7-10) (*Figure 1*).

The treatment goals for postoperative pain are to decrease opioid consumption, control acute postsurgical pain, and minimize the incidence of chronic pain (6,11). To achieve these goals, it is important to use analgesics with different action mechanisms to give maximal pain relief with minimal adverse effects. Moreover, inhibition of the establishment of peripheral and central sensitization, which results in amplification and prolongation of pain, is also important (12). Performing minimal invasive surgery should be taken into consideration as one action for analgesic effect (13) (*Table 1*).

Analgesic options for thoracic surgery

Local analgesia techniques, systemic analgesia, and analgesic adjuncts are known as analgesic options (6,11,12,14). By applying these various analgesics with different action mechanisms, postoperative analgesia can be obtained with opioid-sparing effects.

There are various procedures in local analgesia techniques including thoracic epidural, paravertebral block, intrathecal opioids, intercostal nerve block, intrapleural analgesia, and wound infiltration (11). Thoracic epidural is the gold standard for pain management during the perioperative period for patients undergoing thoracic surgery; however, the procedure can be followed by the technique-related complications as well as the limitations for use in patients receiving anti-coagulants (10,15-18).

Acetaminophen, nonsteroidal anti-inflammatory drugs (7), cyclooxygenase-2 (14) specific inhibitors, and opioids are used for systemic analgesia (14). Opioids are widely used as intravenous patient-controlled analgesia (13) for their high effectiveness and convenience. However, opioids can cause adverse effects such as respiratory depression, sedation, nausea, vomiting, and constipation which are problematic; thus, they can prevent early recovery of patients after surgery and reduce patient satisfaction. In pain control after surgery, opioid-free effect is anticipated to have effectiveness Journal of Thoracic Disease, Vol 10, Suppl 33 November 2018



Figure 1 Schema of the pain route in thoracic surgery. Epidural block and pregabalin can act on the posterior horn of the spinal cord and show effectiveness for neuropathic pain [Taken from reference 9 after modification] (9).

not only in short-term prognosis improvement but also in long-term prognosis improvement. Today, as multimodal approaches have become mainstream in analgesia, it is necessary to have a thorough knowledge regarding nonopioid drugs (6).

Steroids, ketamine, and gabapentinoids are used for analgesic adjuncts (14). Gabapentin and pregabalin are members of the gabapentinoids and are used for postoperative pain management in various surgeries (19-21). Compared to gabapentin, pregabalin is considered more effective as it is absorbed more quickly and shows higher biological activity (22,23).

Pregabalin showed effectiveness equal to or more effective than epidural analgesia in treating postthoracotomy pain (10). In recent years, pregabalin is being considered for preemptive use (13,19).

Preemptive analgesia

Hyperalgesia and tactile allodynia, which cause prolonging of postoperative pain, are known to be triggered by surgical trauma. Establishment of peripheral and central sensitization are involved in the amplification and prolongation of pain; therefore, inhibition of the establishment of these sensitizations is important for preventing postoperative pain (21,24,25). From this perspective, postoperative pain can be reduced by preemptive analgesia, which suppresses the pain circuit, before injury-induced hypersensitivity is established. In various surgeries, the effectiveness of preemptive analgesia has been reported (13,19,20). In video-assisted thoracoscopic surgery (VATS), preemptive administration

Table 1 Managing postoperative pain (6,11,12)
Treatment goals
Decrease opioid use
Control acute postsurgical pain
Minimize incidence of chronic pain
Potential tools
Multimodal analgesia
Local analgesia
Systemic analgesia
Minimally invasive surgery

of pregabalin reduced the amount of opioid use while retaining analgesic effectiveness (13).

Conclusions

Multimodal analgesia in thoracic surgery is effective in increasing analgesic effectiveness and reducing opioidrelated adverse effects. In VATS, preemptive administration of pregabalin is effective.

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Footnote

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