Editorial

Opioid prescription guideline is important to enhanced recovery after thoracic surgery protocol

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The opioid epidemic has resulted in significant socioeconomic cost to individuals and families (1). While opioid analgesics can bring substantial relief to those who experiences severe pain, at the same time they can cause significant side effects and have the potential to induce dependency (2). There has been a concerted effort to control and reduce the use of opioids in the surgical setting to counter these undesirable effects, and many investigative efforts have borne fruit in tailoring pain management regimens that minimize and optimize the use of opioid use in the peri-operative context (3).

In a recent issue of the *Journal of Thoracic Disease*, Mondoñedo *et al.* (4) reported the development of evidence-based opioid prescribing guidelines after lung resection using a prospective, multicenter analysis. Patients were identified across 11 participant centers in the state of Michigan, USA. Patient reported outcomes were analysed from opioid-use survey at 1-month follow-up after lung cancer operation from January 2020 to March 2021. There were a 65% questionnaire response rate with 204 responders. The primary outcome was quantity of opioid used after discharge; secondary outcomes included quantity of opioid prescribed at discharge and patient-reported pain scores. Opioid prescribing recommendations were then developed by the authors by analysing these patient-reported outcomes, in-hospital data prior to discharge, and clinical data such as surgical approach, operation performed, and postoperative length of stay.

Close to half of the patients (51.2%) described having moderate pain during the first week after surgery. In total, 43.7% of patients reported using no opioid after discharge. Patient-reported opioid use was 8.2±13.0 pills after discharge, significantly fewer than the 20.5±13.1 pills prescribed at discharge (P<0.001). Of those who used opioid, one-third (33.8%) used it for less than 1 week after discharge, and more than two-thirds of patients (69.8%) stopped using within 2 weeks after discharge. 10.8% of patients continued to use opioids for more than 4 weeks.

The study found that surgical approach made a difference to opioid use after discharge. A higher proportion of open thoracotomy patients used 11 to 20 pills compared to 1 to 10 pills for minimally invasive surgery (MIS) patients (P=0.007). Patients who were not taking opioids in-hospital on the day prior to discharge used significantly fewer pills after discharge (4.4±8.1 *vs.* 11.7±14.9), and were nearly three times more likely not to take opioids after discharge (62.7% *vs.* 22.6%).

Based on these results, the authors generated a list of

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opioid prescribing recommendations after lung resection. Patients were prescribed around the clock acetaminophen for 72 hours post-discharge. A prescription size of 0–5 pills of oxycodone (5 mg each) was recommended for patients not using opioids on the day prior to discharge, and 0–15 pills for patients after MIS or 0–20 pills for patients after thoracotomy. Opioid education brochures were given to patients at discharge, and clinic reassessment was recommended prior to prescribing opioid refill.

Pain management after thoracic surgery has been a hot area of investigation in the literature. Certain surgical techniques have been associated with low postoperative pain scores may be beneficial in pain reduction (5). In this study, although a higher proportion of open thoracotomy patients used 11–20 pills compared to less than 10 pills for MIS patients, there was no difference in the number of pills used between MIS and open thoracotomy patients (8.2±13.2 *vs.* 8.0±11.1 pills, respectively; P=0.84), and patients undergoing robot-assisted operations used the fewest opioids (5.2±9.7 pills, P=0.004). There are somewhat conflicting evidence in the literature on whether robotic-assisted lung resection was associated with increased opioid use (6). There are also many studies which showed that video-assisted thoracic surgery (VATS) is associated with less postoperative pain compared to thoracotomy (7). Which operative technique may result in reduced pain and opioid usage is an important area that warrants further study.

Multi-modal analgesic strategy is crucial to optimize post-surgical pain management (8,9). There are a multitude of analgesia options available, each with its own strength, safety, side-effect profile, and duration of action. Agents with stronger pain-killing action generally also results in higher risk of experiencing significant side effects. The agents of choice and dosage should be customized and tailored to the magnitude of pain experienced by that patient, which is not static at a constant level but may vary with time and activity level. The best pain management regimen is one that is safe, short-acting, and optimally eliminate the pain without inducing significant systemic or local side effects to normal bodily functions such as breathing, bowel motion, or early mobilization. Thus a balancing act is required to optimize the use of opioid and non-opioid analgesics, and this strategy is best incorporated into a comprehensive enhanced recovery after thoracic surgery (ERATS) program (8).

A comprehensive multi-modal pain management strategy uses a combination of non-opioid and opioid analgesia and approaches pain reduction across the continuum of preoperative education and setting expectation, to intraoperative lowering of opioid usage through regional and local anesthesia techniques (9), to optimal postoperative analgesia protocols and pathways, to outpatient counselling and prescription practices upon discharge from hospitalization. Each of these components are inter-linked and are integral to overall patient comfort and satisfaction, optimal pain control and maximal reduction of opioid use. This is evident by the results in this study which showed that patients who were not taking opioids in-hospital on the day prior to discharge (32.4%) used significantly fewer number of opioid pills, and had a higher proportion requiring no opioids after discharge. This signifies that better pain control in the inpatient setting have a direct effect on improving pain management and reducing opioid usage in the post-discharge home setting. This clearly underscores the importance of optimizing pain management in every step of the way along the patient journey.

All thoracic surgeons should adopt surgical techniques and peri-operative strategies that would reduce pain and opioid use. These include minimally invasive thoracic surgical techniques, incorporation of non-opioid analgesics into a multi-modal pain management protocol, use of locoregional analgesia such as intercostal nerve block or erector spinae block, careful tailoring and titration of the amount of analgesics required adjusting to amount of pain experienced, and early reduction and cessation of opioid prescribed as soon as possible. Excessive opioid prescription is not only unnecessary and wasteful but also encourages over consumption which may promote dependency. This study should encourage thoracic surgeons to introspect and reflect on their own individual prescription practices, and to adopt opioid prescription guidelines that are directly suitable to the patient population within their local context. The evidence-based opioid prescription guidelines after lung resection by Mondoñedo *et al.* (4) can serve as a useful starting point to this quality improvement process and may hopefully lead to better opioid prescription practices by all thoracic surgeons. Opioid prescription practice guidelines should be incorporated into all ERATS protocols (10-12).

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