Editorial

How can we reduce the incidence of postoperative mental disorders after thoracic surgery?

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Provenance: This is an invited Editorial commissioned by the Section Editor Shuangjiang Li (Department of Thoracic Surgery and West China Medical Center, West China Hospital, Sichuan University, Chengdu, China).

Comment on: Wang S, Sigua NL, Manchanda S, *et al.* Preoperative STOP-BANG Scores and Postoperative Delirium and Coma in Thoracic Surgery Patients. Ann Thorac Surg 2018;106:966-72.

Submitted Jan 16, 2019. Accepted for publication Feb 12, 2019.
doi: 10.21037/jtd.2019.02.22
View this article at: http://dx.doi.org/10.21037/jtd.2019.02.22

The postoperative complication rate is relatively high (~30%) after thoracic surgery (1). Recently, the number of complications appears to be decreasing, based on an analysis of the Japanese nationwide annual database that showed that the rate of major postoperative complications was 5.6% in 2015 (2). However, postoperative complications remain a serious concern with regard to recovery, quality of life, length of hospital stay and medical costs. Although advances in perioperative management and surgical techniques may improve the safety of thoracic surgery, the prediction of postoperative complications is mandatory. Many patient demographic and clinical characteristics have been reported as risk factors for postoperative complications, including sex, age, smoking, chronic pulmonary obstructive disease (COPD) (3), lower carbon monoxide diffusion capacity of the lung (4), and duration of surgery (5).

Among postoperative complications, postoperative mental disorders (PMD) may be problematic with regard to medical safety, prolongation of hospital stay and need for additional medical attention (6,7). Moreover, PMD may cause other serious complications. In clinical practice, aspiration pneumonia often becomes a critically severe condition. Ozyurtkan *et al.* reported that postoperative psychiatric disorders developed in 18 of 100 patients (18%) who underwent non-cardiac thoracic surgery (8). The reported incidence of postoperative delirium ranges from 5.3% to 25.0% (3,5,7,9). The development of postoperative delirium may be influenced by many factors, including gender, age (7,10), comorbidities, opioid use (10), pain (11), past history of delirium, use of benzodiazepines (12), abnormal levels of electrolytes and glucose, lack of sleep, and duration of surgery (7). Especially for elderly patients, the development of PMD is a great concern after thoracic surgery. The incidence of delirium increases with age (7). In patients aged ≥70 years in one study, the incidence of postoperative delirium was 14.6% (9).

Obstructive sleep apnea (OSA) is associated with complete or partial obstruction of the upper airway during sleep. Since it causes sleep disturbance, OSA is considered to be a risk factor for complications during postoperative recovery. Thoracic surgeons should screen patients for the presence of OSA with a careful medical interview before surgery. To determine whether OSA risk was associated with postoperative delirium and coma, Wang *et al.* used the STOP-BANG questionnaire before surgery to measure OSA risk (6). They found that patients with an intermediate/high risk of OSA were 3.6 times more likely to develop postoperative delirium and coma compared with patients with a low risk of OSA. Moreover, they reported that patients with an intermediate/high risk of OSA had a longer duration of postoperative delirium and coma compared with patients with a low risk of OSA (6). Thus, the STOP-BANG questionnaire may be a useful tool in the perioperative management of thoracic surgery. If we can determine OSA risk in patients who plan to undergo surgery, it may be possible to reduce the incidence of PMD

after thoracic surgery.

To perform safe surgery and reduce postoperative morbidity, prevention is essential. OSA may be treatable with surgical intervention and continuous positive airway pressure (CPAP). In the Wang *et al.* study, 18 patients were diagnosed with OSA preoperatively (6). Among them, 3 cases resolved with weight loss or surgery, 5 used CPAP at home, 2 used bilevel positive airway pressure (biPAP) at home, 3 used CPAP or biPAP in the hospital, and 8 did not use CPAP or biPAP at home or were not compliant. Miyata *et al.* explored the possibility of medical interventions to prevent PMD and demonstrated that ramelteon, a melatonin receptor agonist, could reduce the incidence of delirium after surgery for lung cancer in elderly patients (9). However, given that PMD may be associated with many factors, it is likely that OSA may not cause mental disorders independently. Murakawa *et al.* reported that an intervention of team management for delirium reduced the incidence of postoperative delirium in lung cancer (12). A multidisciplinary approach should be considered.

To promote postoperative recovery, enhanced recovery after surgery (ERAS) is advocated as an approach aimed at achieving an uneventful recovery after thoracic surgery (13-17). ERAS is based on evidence-based methods focused on providing improved postoperative recovery. ERAS consists of early ambulation; multimodal, opioid-sparing analgesia; and reduction in surgical stress. ERAS is considered to improve the outcomes of surgery, decrease costs, shorten the length of hospital stay, and improve patient quality of life. While there is no definitive evidence of the benefit of ERAS in lung surgery (18), the role of ERAS in the prevention of postoperative complications is regarded as controversial.

In conclusion, Wang and colleagues investigated the relationship between OSA risk and PMD. They revealed that patients with an intermediate/high risk of OSA had a longer duration of PMD in the ICU, especially delirium and coma, than patients with a low risk of OSA. Their study demonstrates that PMD can be predicted. Thus, a multi-disciplinary team approach may be needed to prevent and treat PMD during the perioperative management of patients undergoing thoracic surgery.

Acknowledgements

None.

Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

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Cite this article as: Shiono S. How can we reduce the incidence of postoperative mental disorders after thoracic surgery? J Thorac Dis 2019;11(Suppl 3):S207-S209. doi: 10.21037/jtd.2019.02.22

