Editorial

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Two birds with one stone: palonosetron pretreatment

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Recently introduced anesthetic drugs have a common problem: drug-injection pain. The main disadvantage of propofol, etomidate, and rocuronium is pain on injection, which is very stressful to patients and anesthetic providers. Among 33 clinical problems, propofol-injection pain has been positioned as the seventh most frequently occurring clinical anesthetic outcome which expect to avoid [1]. Numerous types of drugs [2,3] and doses of drugs [4] have been tested to solve the problem of intravenous injection pain of rocuronium. However, there is no definitive single therapy. Many investigations have been performed to elucidate the mechanism of injection pain. However, the mechanism remains obscure.

In this month's *Korean Journal of Anesthesiologists*, Cho et al. [5] evaluated the effect of palonosetron on the injection pain of rocuronium. The authors suggest that palonosetron is effective in reducing intravenous injection pain due to rocuronium. Palonosetron is a second-generation 5-HT3 receptor antagonist with a high receptor-binding affinity. It is mainly used to prevent nausea and vomiting related to surgery and chemotherapy. Ondansetron effectively reduces intravenous injection pain from rocuronium [6]. Ondansetron has an action similar to that of lidocaine in terms of blocking sodium channel. We hesitate to use ondansetron during induction because of its short duration. Ondansetron has a plasma half-life of 4 hours because of genetic polymorphisms of the P450 enzyme which lead to decreased efficacy by ultrarapid metabolism [7]. Ondansetron seems to be more effective when given at the end of surgery rather than immediately after induction of anesthesia because of these polymorphisms [8]. While most serotonin antagonists have similar effects, palonosetron might be an exception. Palonosetron has a long half-life of about 40 hours. Therefore, it can be used during induction. If these beneficial properties are established, palonosetron will be a first choice drug to prevent injection pain of rocuronium.

Many surgeries are currently performed on an outpatient basis. Postoperative nausea and vomiting is a major cause of delayed discharge and unanticipated readmission. To date, the incidence of postdischarge nausea and vomiting has not been studied on a large scale. Note that shorter-acting drugs are not as effective and antiemetics with a longer duration of action appear to be favorable. Palonosetron may be a reasonable choice for postdischarge nausea and vomiting. However, proof for this has not yet been reported.

The manufacturer recommends that palonosetron be used with caution in patients with prolongation of cardiac conduction intervals, particularly QTc. Such patients include those with electrolyte abnormalities and those taking antiarrhythmic drugs [9]. Although the prescribing information recommends caution in patients at risk of QTc prolongation, palonosetron has been safely used to patients with cardiac problems [10].

None of the currently used drugs for prophylaxis of injection pain are capable of completely eliminating the incidence of rocuronium injection pain. When considering a multimodal approach, palonosetron can be recommended as an essential component. Palonosetron might relieve injection pain and postoperative nausea and vomiting in one treatment.

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References

1. Macario A, Weinger M, Truong P, Lee M. Which clinical anesthesia outcomes are both common and important to avoid? The perspective of a panel of expert anesthesiologists. Anesth Analg 1999; 88: 1085-91.
2. Memiş D, Turan A, Karamanlioğlu B, Süt N, Pamukçu Z. The prevention of pain from injection of rocuronium by ondansetron, lidocaine, tramadol, and fentanyl. Anesth Analg 2002; 94: 1517-20.
3. Chiarella AB, Jolly DT, Huston CM, Clanachan AS. Comparison of four strategies to reduce the pain associated with intravenous administration of rocuronium. Br J Anaesth 2003; 90: 377-9.
4. Cheong KF, Wong WH. Pain on injection of rocuronium: influence of two doses of lidocaine pretreatment. Br J Anaesth 2000; 84: 106-7.
5. Cho K, Lee SH, Lee W, Chu BK, Kim MH, Lim SH, et al. Effect of pretreatment with palonosetron on withdrawal movement associated with rocuronium injection. Korean J Anesthesiol 2014; 66: 23-7.
6. Reddy MS, Chen FG, Ng HP. Effect of ondansetron pretreatment on pain after rocuronium and propofol injection: a randomised, double-blind controlled comparison with lidocaine. Anaesthesia 2001; 56: 902-5.
7. Candiotti KA, Birnbach DJ, Lubarsky DA, Nhuch F, Kamat A, Koch WH, et al. The impact of pharmacogenomics on postoperative nausea and vomiting: do CYP2D6 allele copy number and polymorphisms affect the success or failure of ondansetron prophylaxis? Anesthesiology 2005; 102: 543-9.
8. Tang J, Wang B, White PF, Watcha MF, Qi J, Wender RH. The effect of timing of ondansetron administration on its efficacy, cost-effectiveness, and cost-benefit as a prophylactic antiemetic in the ambulatory setting. Anesth Analg 1998; 86: 274-82.
9. De Leon A. Palonosetron (Aloxi): a second-generation 5-HT(3) receptor antagonist for chemotherapy-induced nausea and vomiting. Proc (Bayl Univ Med Cent) 2006; 19: 413-6.
10. Muchatuta NA, Paech MJ. Management of postoperative nausea and vomiting: focus on palonosetron. Ther Clin Risk Manag 2009; 5: 21-34.