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LETTER TO THE EDITOR

Reply to the letter

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To the Editor:

We are very grateful to Kawashima S, et al. for the helpful comments on our manuscript [1]. Our study demonstrated that remimazolam-based total intravenous anesthesia provided a lower hypotension rate and a lower ephedrine dose in anesthetic induction in patients with severe aortic stenosis than propofol-based total intravenous anesthesia [1].

Kawashima S, et al. pointed out that our manuscript did not include the data regarding mean blood pressure and cardiac index; however, the Supplemental Digital Content 1 and 2 in our manuscript provided hemodynamics parameters, such as mean blood pressure and cardiac index, measured from before anesthesia induction to 50 min after tracheal intubation. Second, they have raised a concern regarding the recent report which describes altered EEG monitoring interpretation during remimazolam anesthesia in the patient with a long-term use of benzodiazepines preoperatively, who was administered propofol for anesthetic induction [2]. Although we did not describe in our manuscript, none of our patients received benzodiazepines medication for a long period. Previous report has shown that propofol and desflurane were effective for induction of anesthesia in patients with a history of benzodiazepine use and tolerance to remimazolam [3]. This indicates that changing of sedatives to remimazolam, which is not used as an induction drug, carries a risk of accidental awakening during surgery. In our study, unconsciousness was confirmed with structured tool (MOAA/S) before administration of neuromuscular and a sedative was not changed during anesthesia, which we believe is clinically enough to avoid accidental intraoperative awakening. This can be also confirmed from our presented data which describes the patient sedation index at each measurement point in Table 1. Third, citing a recent multicenter randomized controlled trial [4], Kawashima S, et al. comment that our results are predictable; however, the primary outcome of this multicenter randomized controlled trial was anesthetic efficacy during surgery. Hypotension was one of the secondary outcomes. It must be kept in mind that the role of secondary outcomes is to reinforce the results obtained from the primary outcome or to screen for new hypotheses, and that rigid conclusion of the research can only be drawn for the primary outcome. Additionally, patients with the same American Society of Anesthesiologists physical status classification do not necessarily have the same comorbidities, and it is commendable that only patients with severe aortic stenosis at high risk for hypotension were included. Although it has been stated that future studies evaluating the role of conscious sedation with remimazolam are needed, our study focused on the anesthetic induction in patients with severe aortic stenosis, and therefore the role of remimazolam-based conscious sedation is beyond the scope of our study.

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Table 1 Patient sedation index between two groups

	Remimazolam group	Propofol group
Before anesthetic induction	98.1 ($n=17$)	98.1 ($n=18$)
Immediately after tracheal intubation	35.7 ($n=17$)	37.7 ($n=18$)
10 min after tracheal intubation	38.4 ($n=17$)	30.2 ($n=18$)
20 min after tracheal intubation	36.8 ($n=17$)	30.6 ($n=18$)
30 min after tracheal intubation	35.8 ($n=13$)	32.0 ($n=16$)
40 min after tracheal intubation	38.0 ($n=10$)	30.6 ($n=9$)
50 min after tracheal intubation	38.5 ($n=2$)	31.0 ($n=4$)

After the beginning of anesthetic induction, the patient sedation index in both groups showed between 25 and 50. No statistical test was performed since the purpose was not to compare the depth of anesthesia between the two groups

Data availability This article has no data.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Ethical approval for this manuscript is not needed.

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