The MAC of sevoflurane for maintaining the BIS below 50 during noxious stimulation

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BACKGROUND & GOAL OF STUDY

The minimum alveolar concentration (MAC) for maintaining the bispectral index below 50 (MAC-BIS50) of sevoflurane during a resting state has been reported[1]. However, the MAC-BIS50 of sevoflurane during noxious stimulation has never been determined, and this index may provide clinically useful information. The depth of the anesthesia will decrease under noxious stimulation, and lead to a risk of awareness during the operation. It is reported that tetanic stimulation of 80 mA is equivalent to a skin incision. [2,3]We investigated the MAC-BIS50 during tetanic stimulation (MAC-BIS50-tetanus) of sevoflurane.

METHODS

- The study was performed following institutional review board approval and after written informed consent was obtained from each patient, without psychotic disease, neurological disorder, and dementia.
- Anesthesia was induced with sevoflurane and 50-60% of nitrous oxide in 40-50% of oxygen and air. Under an adequate neuromuscular blockade with 0.6 mg/kg of rocronium, supraglottic device (i-gel or LMA proseal) was introduced.
- Anesthesia was maintained with a predetermined end-tidal concentration of sevoflurane in oxygen and air, and we confirmed that the end-tidal nitrous oxide concentration was below 5%.
- Tetanic stimulation of 80 mA was applied for 10 seconds to the ulnar nerve with a TOF monitor, and The BIS value was recorded 30-s after stimulration every 10-s for 1 minute.

(Figure1)

- We defined The average of 6 BIS values as BIS after stimuration for each patient
- We determined the MAC-BIS50-tetanus by Dixon's up-and-down method.

Figure 1. Study protcol

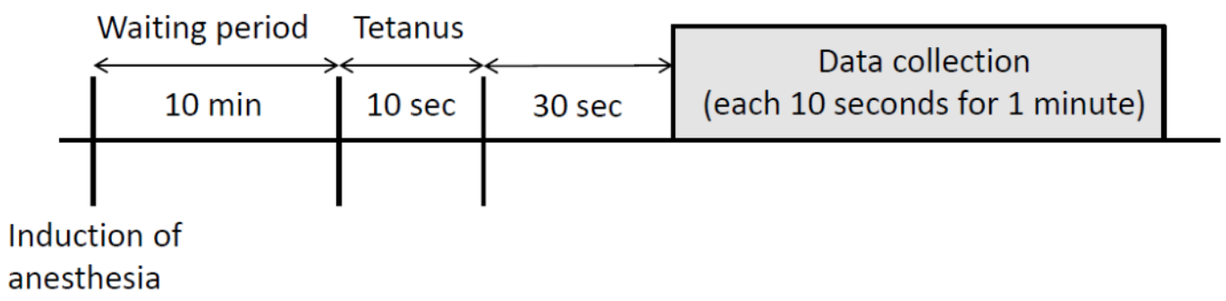
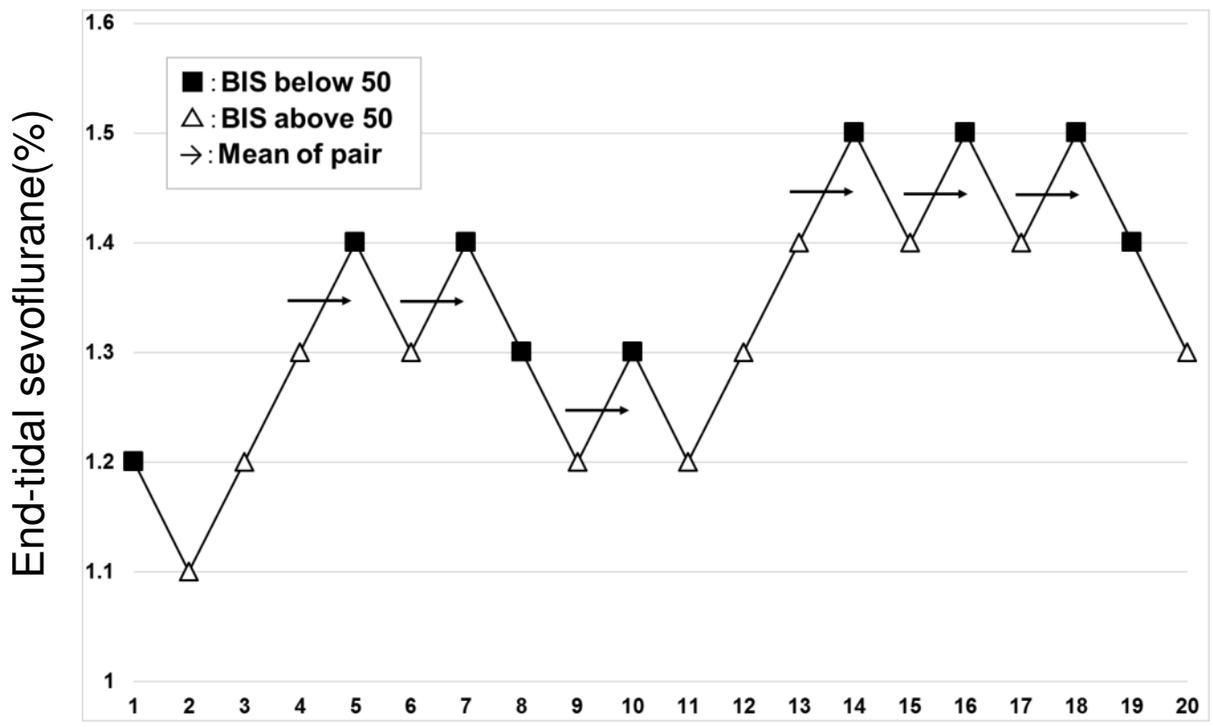


Figure 2. Dixon's up-and-down method.



RESULTS

- We studied 20 middle-aged(41-69 yr) patients（**Table1**）
- The MAC-BIS50tetanus of sevoflurane was **1.38 %** (SE 0.03, 95% CI 1.30-1.47 %).

Table 1. Demographic Data

Age（yr）	60.0±9.3
Weight（kg）	60.6±10.6
Height（cm）	160.0±9.7
Sex（male/female）	6/14
ASA（Ⅰ/Ⅱ/Ⅲ）	（1/13/6）

Data are presented as mean±SD

DISCUSSION

- We found the MAC-BIS50 tetanus of middle-aged patients
- MAC-BIS50 tetanus is equivalent to **0.81MAC**[4]
- When patients have BIS value more than 50, they would move in response to noxious stimuration

CONCLUSION

The MAC-BIS50-tetanus of sevoflurane was 1.38 % (95% CI; 1.30-1.47 %). It was suggested that a half of patients during general anesthesia with a 1.38 % end-tidal concentrations of sevoflurane would have a BIS value more than 50 when noxious stimulation is applied.

We have no conflict of interest to declare.

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