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Bispectral Index (BIS) and Patient State Index (PSI) During Desflurane Anesthesia

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[Background] Intraoperative awakening during general anesthesia is a big anesthetic problem. To avoid awakening, processed EEG parameters, such as bispectral index (BIS) and patient state index (PSI), are used during general anesthesia. Either BIS or PSI is related to the effect of anesthetic agents and uses a specific algorithm. The algorithm is based on EEG data from patients under general anesthesia using propofol and sevoflurane and so on. Data of desflurane was not included in the algorithm. In the present study, to explore the validity of BIS and PSI during desflurane anesthesia, we compare end-tidal desflurane concentration and BIS or that and PSI.

[Methods] Ethical approval for this study was provided by the Ethics Committee of Kumamoto University Hospital, Kumamoto, Japan. Nineteen patients (age: 61.0 ± 13.6) were included in this study. Anesthesia was induced by 1.2 mg/kg propofol and 0.1 $\mu\text{g}/\text{kg}/\text{min}$ remifentanyl and tracheal intubation was performed with rocuronium. After tracheal intubation, sensors for BIS and PSI were attached on forehead. Concentration of inhalation desflurane was increased in a stepwise fashion, such as 3%, 4% and 5%. Each concentration was maintained for 5 minutes. At the end of each concentration, endtidal desflurane concentration (ET-DES), BIS and PSI values were recorded.

[Results] There was a significant relationship between ET-DES and BIS ($r = 0.61$, $p < 0.001$) and between ET-DES and PSI ($r = 0.63$, $p < 0.001$). Moreover, there was a significant relationship between BIS and PSI ($r = 0.84$, $p < 0.001$).

[Discussion] BIS has the same characteristic as PSI during DES anesthesia. These data suggested that, if an anesthetic depth during DES anesthesia was determined by ET-DES, BIS and PSI may be a good parameter of an anesthetic depth during DES anesthesia.



