Usefulness of bispectral index and patient state index during sevoflurane anesthesia in children: A prospective observational study

Jang YE, Kim EH, Lee JH, Kim JT, Kim HS. *Medicine* (Baltimore). 2022 Jul 29;101(30):e29925. doi: 10.1097/MD.0000000000029925.

Cortical electroencephalography-based devices are used to monitor the depth of anesthesia. In this study, we evaluated the values of bispectral index (BIS) and patient state index (PSI) during sevoflurane anesthesia in children. The ability/accuracy of BIS and PSI to predict the maintenance and recovery state of anesthesia was evaluated based on prediction probability (Pk) values and the secondary outcomes were agreement and correlation of 2 monitors. Fifty children (3-12 years old) were enrolled and the patients received sevoflurane anesthesia with remifentanil followed by propofol administration. Before the induction of anesthesia, BIS and PSI sensors were simultaneously placed on the forehead, and data were collected until the end of anesthesia. Maintenance state was defined as the period following intubation until the cessation of sevoflurane, while recovery state was defined as the period following the cessation of sevoflurane until awake. Pk, agreement or correlation of BIS and PSI in different anesthesia state were calculated. Anesthesia reduced mean BIS and PSI values. Pk of BIS (95% confidential interval [CI]: 0.78-0.91) and PSI (95% CI: 0.82-0.91) for anesthesia were 0.85 and 0.87, respectively. Agreement was 0.79 for recovery state and 0.73 for maintenance state. Pk values were comparable for BIS and PSI. Agreement between BIS and PSI measurements in the same state was relatively good. Therefore, these monitors are appropriate for monitoring for different state of anesthesia in pediatric population.

Trial registration: ClinicalTrials.gov NCT03792334.