The current study examines whether analysis of identical EEG data results in a high correlation coefficient of BIS and CSI values during all anesthetic levels and assesses the concordance of both EEG monitors for displaying the level of anesthesia as defined by the manufacturers. EEG data of 40 patients undergoing elective surgery under general anesthesia with either sevoflurane/remifentanil or propofol/remifentanil were replayed to an EEG player and reanalysed by a BIS A-2000® monitor and a Cerebral State Monitor. Further, research into differences between CSI and BIS index values was performed, e.g., extraction of differences of $\geq 10$ and $\geq 20$ index points and of the EEG length with differing index values. The overall correlation coefficient was 0.68 without significant difference between propofol or sevoflurane group. In 51.8% of all recordings, both EEG monitors agreed in their classification of the anesthetic level. The number and length of differing index pairs was influenced by varying time delays of index calculation and different algorithms of index computation. In contrast to previous studies, our current approach combines the following conditions: analysis on basis of identical underlying EEG data from deep to light anesthesia, no guidance of anesthetic administration by one of the EEG-based monitors, avoidance of simultaneous EEG readings and the use of two different anesthetic regimens. Though the result of EEG
analysis during anesthesia is similar with both monitors, CSI performance during propofol anesthesia was superior to sevoflurane anesthesia. Consequently, a lower agreement of classification of anesthetic levels between BIS and CSI was reached with the use of sevoflurane. Thus, CSI calculation seems not to be independent from anesthetic agent.