The utility of EEG spectral analysis in epileptiform activity identification in a child under general anesthesia

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INTRODUCTION

• In a patient under general anesthesia, epileptiform discharges may only be diagnosed if an electroencephalogram is performed.
• Intraoperative monitoring with bilateral BIS may be used to diagnose epileptiform activity in this setting, namely spectral analysis.
• We report a case in which bilateral BIS allowed for the diagnosis of epileptiform discharges.

CASE REPORT

A 12-year-old girl was submitted to surgical correction of a lumbar scoliosis through posterior approach.

Past medical history: neuromuscular scoliosis, spastic quadriplegic cerebral palsy (post-anoxic)
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INTRA-OPERATIVE

✓ Total intravenous anesthesia, with a propofol and remifentanil under target controlled infusion (TCI); Rocuronium;
✓ Intubation was uneventful;
✓ Monitoring was ASA standard plus cerebral oximetry monitoring; and bilateral processed EEG (INVOS® and BIS® respectively).

✓ The remaining procedure was uneventful and BIS and spectrogram patterns were compatible with propofol anesthesia.

✓ After surgery, the patient was admitted in the pediatric ICU under midazolam and morphine perfusions. Bilateral BIS/spectroscopy was kept in the post-op monitoring.

✓ After direct inquiry, the mother remembered some episodes compatible with absence seizures, which were medicated until the first year of life.

DISCUSSION

• Bilateral BIS spectroscopy may allow for the recognition of epileptiform discharges, but confirmation with conventional EEG is necessary.
• There seems to be a good correlation between spectroscopy patterns and the utilized drugs and concentrations, allowing for a better control of the anesthetic process.
• The use of bilateral BIS in the ICU setting may detect epileptiform activity and impact clinical and therapeutic decisions.

LEARNING POINTS

✓ Spectrogram monitoring with bilateral BIS may be used as a supplementary tool to detect epileptiform activity, especially when continuous EEG monitoring is not available.
✓ The definite diagnosis of epileptiform activity may only be established with a conventional EEG.