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)
- ❑ 5th grade Elementary School, Special Educations Needs. Speech Therapy Programme, Occupational Therapy, Hydrotherapy.

INTRA-OPERATIVE

- ✓ Total intravenous anesthesia, with a propofol and remifentanyl 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).

Anesthetic induction

INVOS and Bilateral BIS

Levetiracetam 300mg
Increase propofol target-dose

- ✓ The remaining procedure was uneventful and BIS and spectrogram patters 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 an conventional EEG.