

Bispectral Index Monitoring for Early Detection of Brain Death in Pediatric Patients

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Objectives:

To evaluate the Bispectral Index Scale (BIS) monitor as a method of brain death (BD) detection in the pediatric population.

Methods:

We performed a prospective study in an Intensive Care Unit of a university hospital. A Philips Bispectral Index Module using Aspect Medical Systems'XP platform technology and the sensor BIS Quatro were used to continuously record values: BIS, suppression rate (SR), quality of the signal index and electromyographic (EMG) activity.

Results:

The authors report their experience presenting three pediatric patients who developed BD, one due to a brain tumour, one in the context of drowning and one after severe cranial and abdominal trauma after traffic accident. These children had 12 months, 21 months and 11 years old, respectively. We detected a gradual decrease in BIS and increase in SR when the patients underwent clinical progression to BD. These patients maintained persistent values of BIS 0 and SR of 100 after suspension of sedation. Procedures to confirm BD were made accordingly to diagnosis protocols from Portuguese legislation based on neurological clinical exploration. EEG provided confirmation of BD diagnosis in two of the patients.

Conclusion:

Bispectral index as a non-invasive, real time and easy to interpret EEG continuous monitoring, could improve the timely diagnosis of brain death and therefore enable appropriate scheduling of confirmatory tests and facilitate organ donation for transplantation.

Key Words: BIS, brain death, organ donation, pediatric intensive care