USEFULNESS OF THE BISPECTRAL INDEX (BIS) IN PATIENTS TREATED BY EXTRA CORPOREAL LIFE SUPPORT (ECLS) FOR REFRACTORY CARDIAC ARREST

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INTRODUCTION

Despite increasing use of extracorporeal-life-support (ECLS) for treatment of refractory cardiac arrest patients, prognosis remains dismal, often resulting in brain-death. However, clinical assessment of brain-death onset is difficult in post-cardiac arrest patients, sedated, paralyzed and under mild therapeutic hypothermia (MTH).

Objective: assess usefulness of BIS monitoring for detection of brain-death onset in refractory cardiac arrest patients treated by ECLS.

METHOD

Retrospective study in an intensive care unit at Necker hospital.

Forty-six patients suffering from refractory cardiac arrest treated by ECLS.

BIS continuously recorded during ICU hospitalization & clinical brain-death onset was confirmed when appropriate by EEG and/or cerebral CT scan.

RESULTS

29 evolved into brain-death and had average BIS values under MTH and after rewarming (temperature $\geq 35^{\circ}\text{C}$) of 4 (0–47) and 0 (0–82), respectively. Among these, 11 (38%) entered into a procedure of organs donation. Among the 17 non-brain-dead patients, the average BIS values at admission and after rewarming were 39 (0–65) and 59 (22–82), respectively. In both groups, no difference was observed between the AUCs of ROC curves for BIS values under MTH and after rewarming (respectively 0.85 vs 0.96, $p > 0.05$).

DISCUSSION

Despite mild hypothermia and ECLS, a lower BIS value after CA is associated with a poor neurological outcome. A BIS value of zero is a good predictor of brain death.

Since BIS monitoring is non invasive and its interpretation requires a limited training, it could be used in refractory patients under ECLS and mild therapeutic hypothermia in ICU, in order to reduce time to organ harvesting and reducing waste of health resources in futile resuscitation.