

QEEG predicts the recovery of coma patients caused by cardiac arrest!

Ischemic brain injury, which is commonly caused by cardiac arrest, has a significant effect on the patient's prognosis even after the return of spontaneous circulation. By analyzing coma patient's QEEG in the ICU, it is possible to predict whether a) the patient can regain their consciousness (or wake up) and recover (good prognosis); b) stay in coma; c) or will develop disabilities caused by the brain damage (poor prognosis).

Purpose

To evaluate the correlation between QEEG features with prognosis PCAS patient's neurological outcome. The QEEG features include power spectral density (PSD) and DMN (Default mode network)* connectivity taken within 72 hours after ROSC

*DMN (Default Mode Network): It is a network related to resting state when waken and it is used as an important biomarker for Coma patient's recovery.

Subjects / Methods

183 PCAS patients received targeted temperature management (TTM) / 123 male, 60 female / average age: 53.4 years

Used Cerebral Performance Category* to analyze neurological outcome, 53 people in the good neurological outcome group (Good; CPC 1~2),

130 people in the poor neurological outcome group (Poor: CPC 3~5). Outcome comparison was done with 'Brain function evaluation(QEEG analysis by iSyncBrain)'

*CPC, Cerebral Performance Category: Indicator to evaluate the neurological outcome, 1 point (recovery), 2 points (moderate disability), 3 points (severe disability), 4 points (vegetative state), and 5 points (brain death).

Conclusions

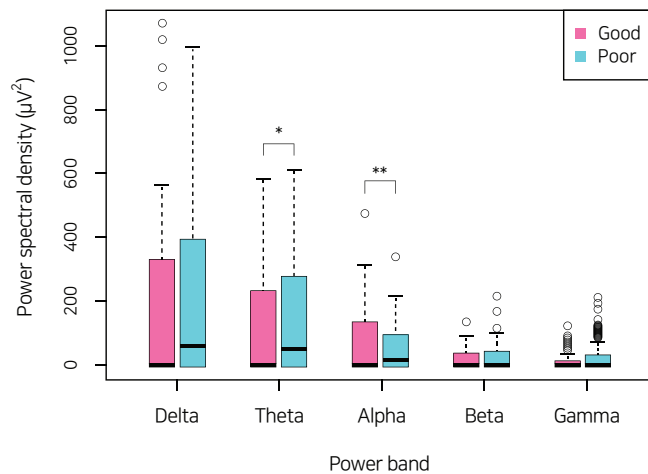
If DMN of the alpha frequency band is active in coma, there is a high possibility of waking up and returning to normal life.

If not, they cannot wake up or will have disability even after waking up.

Results

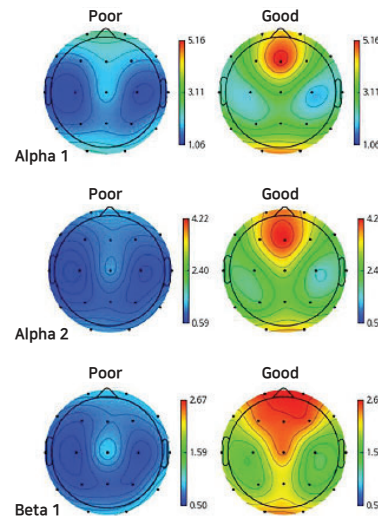
Power Spectrum Density analyses results

- Theta band power increased in the poor neurological outcome group.
- Alpha band power increased in the good neurological outcome group.



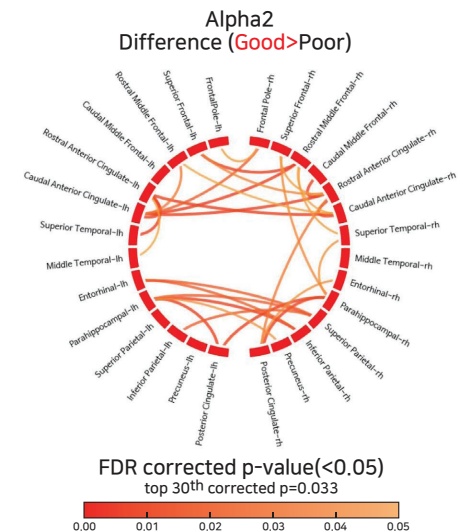
Topomap (Abs. Power) analyses results

In the good neurological outcome group, Alpha 1, Alpha 2, Beta 1 band power increased more than poor neurological outcome group.



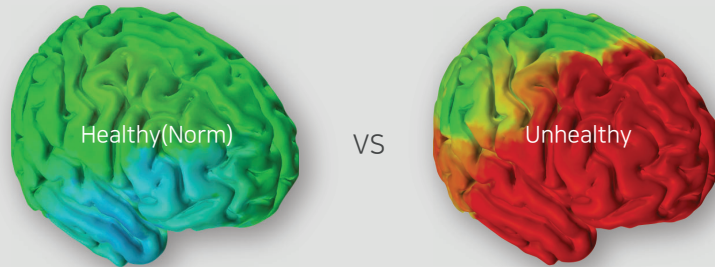
DMN connectivity analyses results

In the good neurological outcome group, iCoh significantly increased more than poor neurological outcome group.



Normative Comparison

Comparison with Normative Database Group



Powerful group statistical analysis
utilizing normative library
The world's one and only age and sex
specific normative database

Independent t-test (G1 vs G2)

Used for comparison between
two independent groups



Paired t-test (Pre vs Post)

Pre-post comparison
within a group



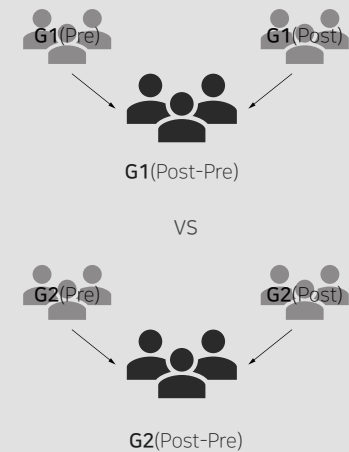
ANOVA (3-Group)

Comparisons among three
independent groups



2-Group (Two arm study)

Comparison between two groups
using each group's pre-post differences



1 : 1 Comparison

Pre and post comparison
for an individual

