

Umbilical cord blood therapy showed brain development recovery in children with cerebral palsy! Proved by a CHA Bundang Medical Center, Professor Min Young Kim's team(Department of Rehabilitation Medicine)

Purpose

The research was conducted towards children with cerebral palsy(CP), to identify the individual or synergistic efficacies of UCB(Umbilical Cord Blood)* and EPO(Erythropoietin)* combination intervention treatment by evaluating with Quantitative Electroencephalography(QEEG).

* UCB / * EPO : UCB was reported to exert neuroprotective, anti-inflammatory, and anti-apoptotic effects.

EPO potentiate the efficacy of cell therapy and have been introduced to exert neuroprotective and neuro repair effects.

Subjects / Methods

88 children diagnosed with CP between 10 months and 6 years of age / 46 male, 42 female / average age 3 years

Children were segregated into four groups, about 20 people each. (A) UCB+EPO, (B) UCB+placebo EPO, (C) placebo UCB+EPO, and (D) placebo UCB+placebo EPO

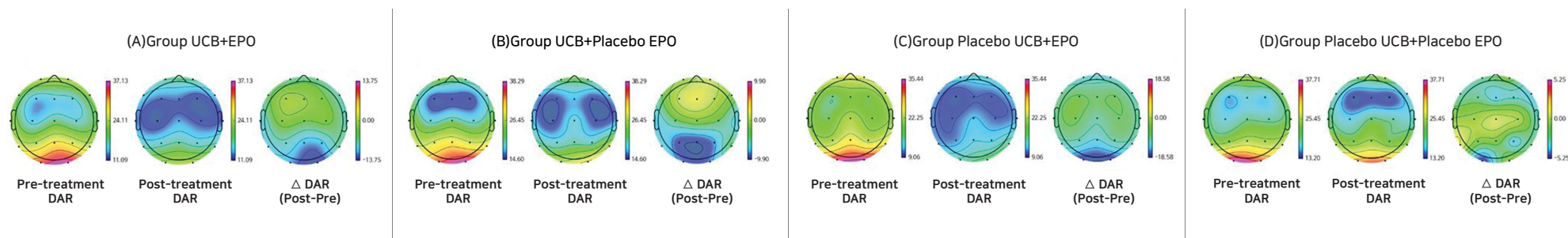
Outcome comparison was done with 'Brain function evaluation(QEEG analysis by iSyncBrain)', Delta/Alpha Ratio was used as main QEEG analysis indicator.

Results

Power Ratio analyses results (DAR)

Compared with the post-intervention treatment(baseline), we confirmed the changes of ratio of Delta Power and Alpha Power in 4 groups after intervention treatment(12 months). Compared to placebo group, UCB or EPO intervention treatment group showed a significant decrease of Delta/Alpha Ratio. This tendency was most evident in UCB+EPO combined intervention treatment group.

In other words, delta band decreased while alpha band showed significant activation in the intervention group.

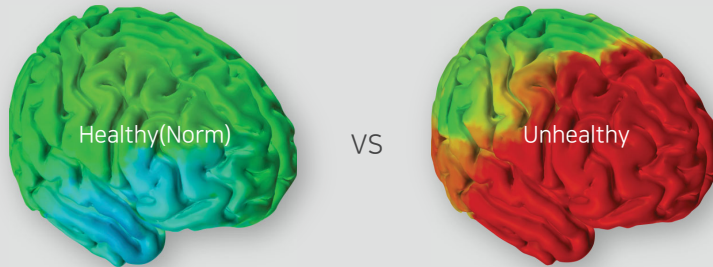


Discussion

In normal brain development process, Delta band decreases while Alpha band(Dominant rhythm) increases. Before treatment intervention for children with CP, Delta band has increased, and Alpha band activation tends to be suppressed. But in the intervention treatment group, delta band has increased, and alpha band became more activated. These improvements did not show in placebo groups. This research indicates UCB or EPO treatment helps children with CP to recover normal brain development pattern. To prove this intervention effect, QEEG indicator was implemented and has shown to be a highly useful biomarker.

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



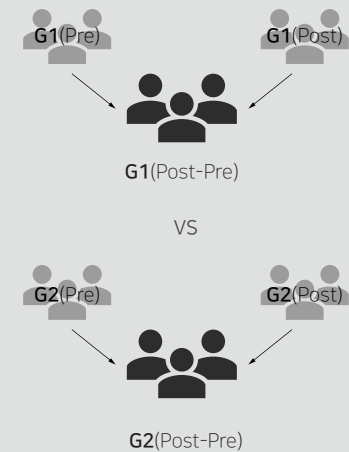
ANOVA (3-Group)

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

