Effect of the Nootropic Compound Alpha BRAIN® on ERP and EEG Measures of Cognitive Performance

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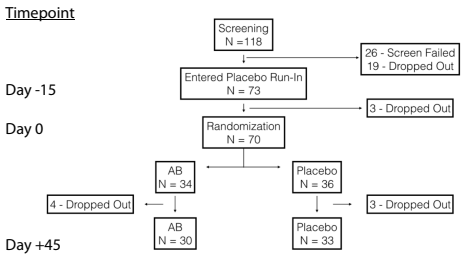
Background

Alpha BRAIN® (AB) is a nootropic supplement that purports to enhance cognitive functioning. Several of the naturally occurring compounds in AB have cholinesterase inhibiting properties and could prove beneficial in individuals with subjective memory complaints or objective cognitive impairment due to Alzheimer's disease or other cognitive disorders. This study investigated the effects of AB on ERP and EEG cognitive measures in healthy adults.

Compound	Per Serving (mg)
AC-11	330
Bacopa Monnieri*	100
Huperzine Serrata*	44
L-Alpha glycerylphosphorylcholine	100
L-Leucine	60
L-Theonine	180
L-Tyrosine	270
Oastraw 20:1	100
Phosphatidylserine	50
Pterostilbene	0.75
Vitamin B6	10
**Inhibits Acetylcholinesterase*	

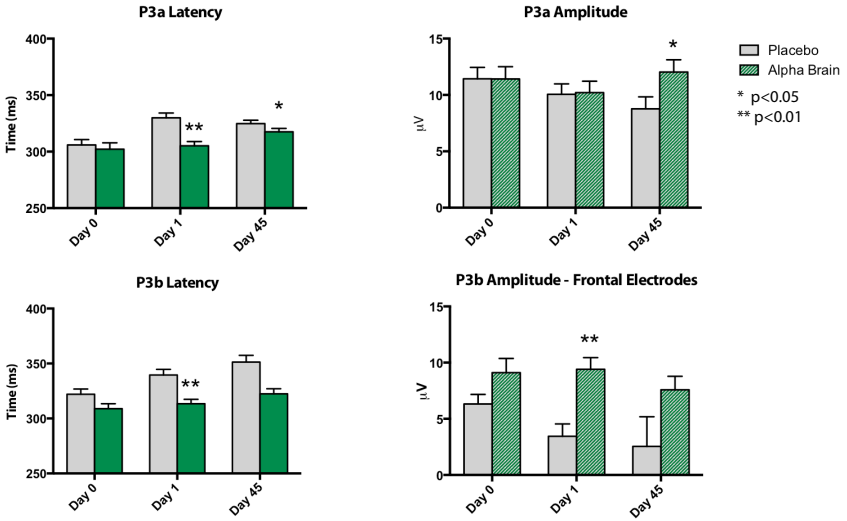


Methods

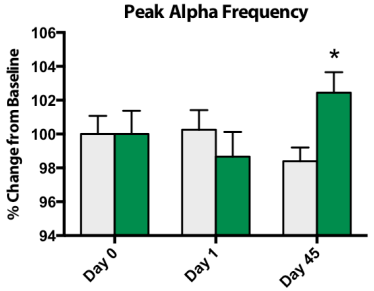
Twenty subjects between 18 and 35 years were recruited into the ERP/EEG study from a larger cohort participating in an eight-week, randomized, double-blind, placebo controlled trial of AB. All subjects were administered an EEG/ERP test following a 2-week placebo run-in (day 0), after acute treatment (one hour post administration, day1), and at the end of the study (day 45), using an integrated hardware/software system for data collection and analysis. The testing protocol consisted of a two-deviant auditory oddball paradigm followed by 3min of resting EEG.

Results

Statistical analysis revealed a significant decrease in P3a and P3b latency in the AB® group compared to placebo. Post-hoc analyses showed a significantly shorter latency for both measures after acute administration of AB®, suggesting increased attention and classification speed in this group of subjects. Moreover, ANOVA with repeated measures showed a significant effect of treatment on P3a amplitude over time, suggesting a positive effect of AB on executive function. While statistical comparisons for P3b amplitude showed no significant effects, a sub analysis limited to the frontal electrodes showed a significant increase in P3b amplitude in the treatment group, suggesting an increase in amount of attentional resources allocated to the stimulus after AB.



Finally, comparison of Peak Alpha Frequency (PAF) in Placebo vs. AB groups showed a significant increase in PAF after repeated treatment administration. This EEG measure is directly correlated with processing speed and performance in a number of cognitive tasks and it has been found to decrease with age.



Discussion

While preliminary, our results suggest beneficial effects of AB on both ERP and EEG measures of cognitive performance. These effects appear similar to other cholinesterase inhibiting compounds that are used in patients with cognitive dysfunction due to Alzheimer's disease and other cognitive disorders.

Reference

Angelakis, E. et al. (2004). Peak alpha frequency: an electroencephalographic measure of cognitive preparedness. Clinical Neurophysiology: 115(4), 887–97.
Polich, J. (2007). Updating P300: an integrative theory of P3a and P3b. Clinical Neurophysiology: 118(10), 2128–48.
Polich, J., & Criado, J. R. (2006). Neuropsychology and neuropharmacology of P3a and P3b. International Journal of Psychophysiology, 60(2), 172–185.