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THE EFFECTS OF L-THEANINE CONTAINING FUNCTIONAL BEVERAGE ON MENTAL RELAXATION AND FATIGUE PERCEPTION

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BACKGROUND

L-theanine is one of the most popular amino acids included in green tea and has been known to produce mental relaxation, lower blood pressure and improve learning ability in human beings. But, few studies on these effects for human beings have been conducted so far. This study was conducted to evaluate the effect of L-theanine containing functional beverage on mental relaxation and fatigue perception.

METHODS

Twenty two healthy volunteers aged 30 to 55 years who have persistent fatigue more than 1 month without any specific disease were recruited through written advertisement. All subjects gave written informed consent, and the study was approved by Institutional Review Board of St. Mary's Hospital. Study 1 for immediate effect on δ to β power value of EEG and study 2 for 7-day short term effect on fatigue perception were performed before and after administration of test (200 mg Suntheanine) or placebo solution in double-blind-placebo-controlled-randomized cross-over and parallel design, respectively. Pathologic fatigue due to disease state was screened through medical history, physical examination, laboratory tests and questionnaires (including Hospital anxiety-depression, and Fatigue severity scales). Subjects were asked to refrain from use of caffeine containing food or beverage, alcohol on either study day. δ to β power value of EEG as a surrogate marker of mental relaxation was measured in frontal and occipital regions for an hour after administration of placebo or test solution and crossed over at 7-day intervals. We analyzed average δ to β power value of EEG in frontal and occipital regions at 10 minute intervals for each 5 minutes. Differences of fatigue severity scale (FSS) between baseline and after consecutive 7-day administration of placebo or test solution were also evaluated.

RESULTS

Two volunteers were dropped out due to anemia and depression. Repeated ANOVA revealed that there were significant differences of α to β power value in frontal region between placebo and test in high anxiety group ($P < 0.01$). The mean values at time 25 min, 35 min, 45 min and 55 min were 0.48, 0.52, 0.66, and 0.61 in placebo and 0.82, 0.78, 0.86, and 0.97 in test, respectively. But there were no significant differences of α to β power value in frontal region between placebo and test in low anxiety group ($P > 0.05$). Fatigue score was significantly decreased in test ($P < 0.01$), but not in placebo ($P > 0.05$) after consecutive 7-day administration of placebo or test solutions (one bottle per day). The mean differences from baseline in placebo and test were -0.36, and -0.89, respectively.

CONCLUSIONS

The results of this study suggest that L-theanine containing functional beverage should promote α to β power value in relation to mental relaxation, and also have the effect of reducing the fatigue perception.