

Ameliorated effect of theanine on premenstrual syndrome (PMS) in volunteers.

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Summary

We examined the effect of theanine, γ -glutamylethylamide, which is one of the major components of amino acids found in Japanese green tea, on brain monoamines, striatal dopamine release and some kinds of behavior in rats. Then we observed that the absorbed theanine was incorporated into brain, affected brain monoamine metabolism, and showed the beneficial effect of brain function such as some kinds of behavior. Also, theanine might affect the relaxation. Because, within 30-40min after the oral administration of theanine, α -brain waves were generated on the occipital and parietal regions of the brain surface in human volunteers. In general, generation of α -brain waves is considered to be an index of relaxation. Therefore, we examined the effect of theanine on various symptoms caused by pre-, during-, and post-menstruation in human volunteers. By using the questionnaire proposed by Moos, the overall results showed that the administration of theanine improved various mental and physical symptoms in menstruation.

Key words

Theanine, α -brain waves, electroencephalogram, premenstrual syndrome(PMS), relaxation

Introduction

In general, it has been said that drinking green tea brings relaxation. It was found that theanine administered intraperitoneally to rats reached the brain within 1hour without any metabolic change (1). That is: it has been revealed that theanine was absorbed quickly in the intestinal tract (2) and showed characteristic physiological activities. However, in the green tea extracts, caffeine which one of the stimulator of the central nervous system is contained. Until now, theanine has been known to act antagonistically against paralysis induced by caffeine. Theanine also acts as a neurotransmitter in the brain and decreased blood pressure significantly in spontaneously hypertensive rats (3,4). For human volunteers, after drinking the theanine, the activity of parasympathetic neurons was enhanced. In general, animals and humans always generated very weak electric pulses on the surface of the brain, called brain waves. Brain waves are classified into four types, namely α , β , δ and θ -waves, based on mental conditions. Generation of α -waves is considered to be an index of relaxation. In the present study, the effects of theanine on relaxation such as brain waves for the PMS human volunteers were examined.

Materials and Methods

A volunteer test was performed to investigate the mental effect of theanine. Usually, brain waves are classified into four kinds, named α , β , δ and θ waves, according to frequency. Each brain wave is related to individual mental conditions. And generation of α -waves is considered to be an index of relaxation. Since it was expected that mental response to theanine could be varied with anxiety level, 70 female subjects (21–28 years old) answered prior questionnaire of physical and mental complaint. The examinee was chosen who was agreed to the experiment, menstrual cycle was stabled, no dose of the drug and the presenting the symptom of the PMS. The examinee was finally limited to 7 persons. The experimental schedule were shown in fig.1. To the examinee, even if basal body temperature is measured every day, leprosy ovulation day placebo or theanine tablet were taken from estimated ovulation day to the during menstrual day3. Next menstrual cycle, tablet was changes and taken under the equal condition. The questionnaire was done before 7day and 3day and after 7day of menstrual start day. In addition, it was also done on 1day and 3day in the menstrual. The result of the questionnaire was analyzed end of experiment, and the answer of each article was made and was evaluated into the score. In this experiment, the changes of mind and body which appears with menstrual cycle is evaluated by MDQ(menstrual distress questionnaire) which made moos et al.

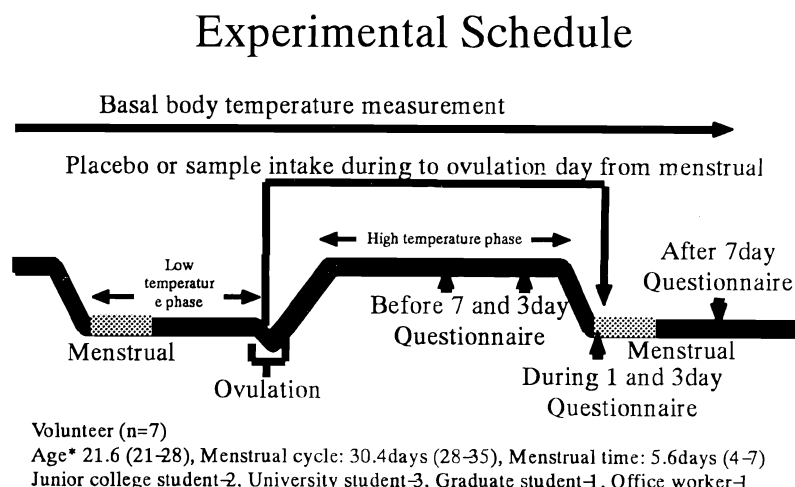


Fig.1 Experimental Schedule

Results and Discussion

Brain wave, especially α -brain waves were generated by theanine intake. (Data not shown) On the effect of PMS in volunteers, shown in Fig.2. It is shown. that the MDQ score of

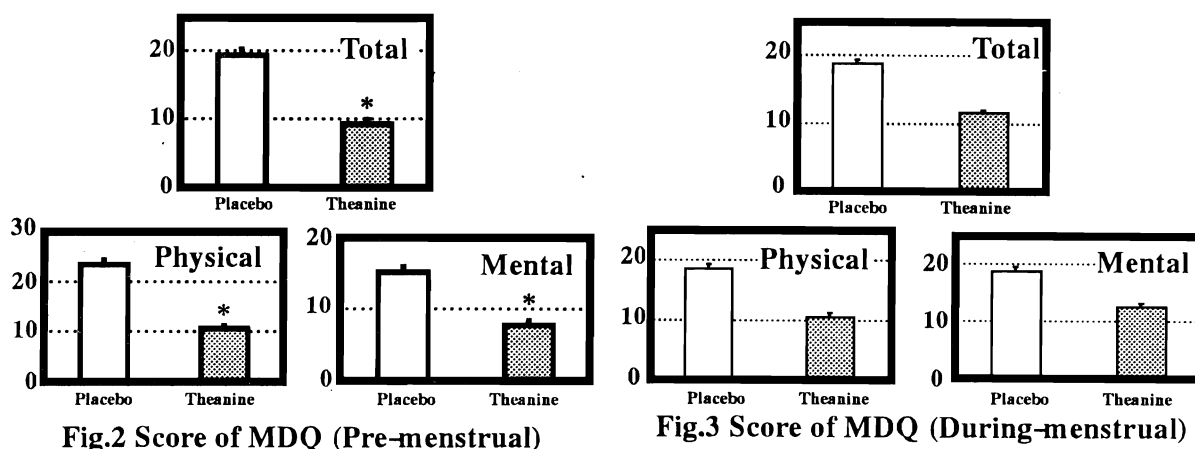


Fig.2 Score of MDQ (Pre-menstrual)

Fig.3 Score of MDQ (During-menstrual)

pre-menstrual period. The theanine intake was significantly decreased all of MDQ score. In addition, the MDQ score of during-menstrual period was decline. (Fig.3)

It becomes clear that theanine intake was decreased the symptom of the PMS at pre-menstrual period. And, there seemed to be the relaxation action for the physical and mental change which is during-menstrual period. The increase of the α -wave by a theanine intake may be also related to such action. Though on the mechanism of such relaxation effect by the theanine, it is not clear. It wants to analyze the well-informed mechanism in future.

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