

The world's first clinical study comprehensively analyzing the effects of the long-term intake of matcha

Daily Intake of Matcha Confirmed to Improve Sleep Quality and Social Cognitive Function

Presented at Alzheimer's Association International Conference (AAIC2022) on Tuesday, August 2.

ITO EN, Ltd. (President: Daisuke Honjo; headquartered in Shibuya-ku, Tokyo) and MCBI Inc. (Chief Executive Officer: Yoshihisa Tokumi; headquartered in Tsukuba City, Ibaraki), a venture corporation established by the University of Tsukuba, jointly conducted a clinical trial to assess matcha's inhibitory effects on the decline of cognitive function in the older adults with mild cognitive impairment (MCI), the pre-stage of dementia, or subjective cognitive decline (SCD). Researchers found that the daily intake of matcha was associated with an improvement in sleep quality and social cognitive function. The joint research team published the results of their research at the Alzheimer's Association International Conference (AAIC)* held in San Diego, California, USA on Tuesday, August 2, 2022.

* Alzheimer's Association International Conference® 2022:

The world's largest international conference aimed at advancing dementia science and sharing the results of research that can lead to the prevention, diagnosis and treatment of Alzheimer's disease. Held in-person and online from Sunday, July 31, 2022 to Thursday, August 4, 2022.



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Daily Intake of Matcha Confirmed to Improve Sleep Quality and Social Cognitive Function



Subjects: 99 participants (60-85 years)*

Period: 12 months

Methods: Cognitive function evaluations, blood-based biomarkers, kinetic analyses (blood tea component levels), neuroimaging (fNIRS and Amyloid PET imaging) sleep evaluations, etc.

*Participants diagnosed with mild cognitive impairment (MCI), the pre-stage of dementia, or subjective cognitive decline (SCD).

Amount of intake: 2g matcha per day

Matcha has been popular in Japan for a very long time. The beverage contains catechin and theanine. Previous studies suggested that catechin reduces blood cholesterol levels and body fat and also improves working memory, and theanine relieves stress and improves sleep and working memory. Additionally, it has been reported that the short-term intake of matcha can increase attentiveness and the accuracy of decision making in the middle-aged and older adults.

In this clinical study, participants undertook cognitive function evaluations, blood-based biomarkers, kinetic analyses (blood tea component levels), neuroimaging (fNIRS and Amyloid PET imaging) and sleep evaluations before and after the intervention involving the long-term intake of matcha to comprehensively analyze the effects of matcha and changes in biomarkers.

For inquiries about this news release, please contact: Public Relations Department of ITO EN, Ltd.

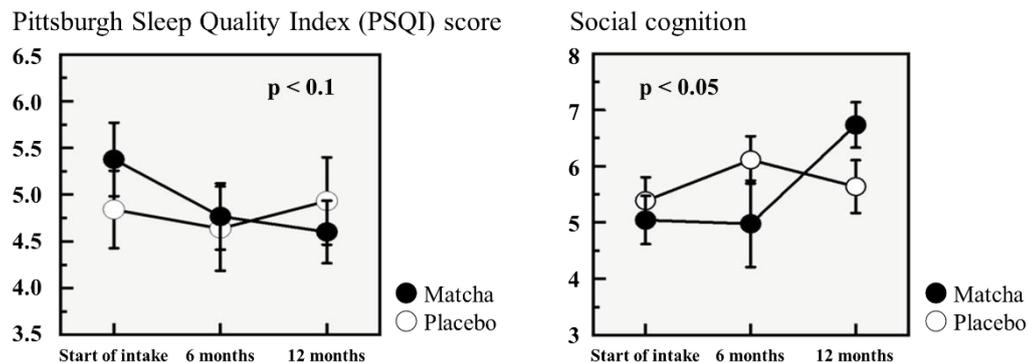
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○ **Methods**

This trial was conducted as a double blind placebo-controlled randomized comparative study of 99 participants diagnosed with mild cognitive impairment (MCI), the pre-stage of dementia, or subjective cognitive decline (SCD), the preclinical stage of Alzheimer's disease, selected from 939 participants aged 60 to 85 to investigate the effect of the long-term intake of matcha on cognitive function, etc. Participants in the matcha group took matcha capsules (2 g matcha per day) for 12 months while participants in the placebo group used capsules filled with colored corn starch. Changes in the endpoints from the start of the study to Month 12 were statistically validated using mixed effects models.

○ **Effects of matcha on quality of sleep confirmed and social cognitive function (perception of emotions based on facial expression).**

The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate quality of sleep, revealing a trend toward a decrease in PSQI scores and **improve quality of sleep** in the matcha group (the figure on the left). As a result of neuropsychological tests (e.g., MMSE-J, MoCA-J) that are used for dementia and MCI screening, there was no difference in the cognitive function scores of the matcha group and the placebo group. When cognitive function was evaluated using Cognitrix (CNS Vital Signs, LLC) for each brain region, the matcha group showed a significant improvement in social cognition assessed with a facial expression recognition test, specifically, **the precision of their perception of emotions based on facial expression** compared to the placebo group (the figure on the right).



In research and development, we view the value of tea with a scientific eye, and engage in research and development to propose lifestyle improvements to enable people to live fulfilling lives in the era of the 100-year life expectancy. We believe that it is extremely important for elderly people to quality of sleep and maintain their social cognitive function (perception of emotions based on facial expression) so that they experience a better quality of life in a super-aged society. The research team will elucidate the relationship between the **daily intake of matcha and improve quality of sleep or improved social cognitive function**, which were observed in the study, and the mechanism for these effects. In addition, the details of other tests will be analyzed. Through the initiative, ITO EN and MCBI will contribute to the realization of healthy and rich living and a sustainable society through efforts to enable the elderly living in super-aging society to live fulfilling lives.

Research collaborators:

Division of Clinical Medicine in the Department of Psychiatry (Prof. Tetsuaki Arai)
Memory Clinic Toride (Dr. Takashi Asada, Director)

Descriptions of terms

Mild cognitive impairment (MCI)

MCI is a precursor state of dementia, such as Alzheimer's disease. Those with MCI forget things frequently but do not have trouble carrying out daily activities.

It is believed that 40% of those with MCI will develop dementia, such as Alzheimer's disease, after four years.

Subjective cognitive decline (SCD)

The pre-stage of mild cognitive impairment (MCI). Those with SCD are aware that they forget things frequently, but cognitive decline is not recognized objectively.

fNIRS (functional Near-Infrared Spectroscopy)

fNIRS is a brain function imaging apparatus that shows changes in blood flow measured at multiple points, using near infrared light, which is mostly transparent in living bodies.

fNIRS stands out from other technologies designed for the visualization of brain functions because it facilitates the measurement of brain activity in a somewhat natural, safe environment.

Amyloid PET

Amyloid PET imaging is an imaging diagnosis method based on positron emission tomography (PET) imaging of amyloid that enables the visualization of amyloid β accumulated in the brain.

Amyloid β

Amyloid β deposition (senile plaques) indicates the pathological lesions induced by Alzheimer's disease. Amyloid β also indicates neurotoxicity.

The abnormal production and accumulation of Amyloid β is believed to be closely associated with the development of Alzheimer's disease.

Cognitrax (CNS Vital Signs, LLC)

Ten item computer-based cognitive function test.

The clinical study used four types of testing to avoid duplication with other neuropsychological tests: The Stroop test (evaluating the match of the name and color of words; e.g., letters meaning blue but painted in black), shifting attention test (choosing one shape from shapes including triangles and squares according to randomly chosen instructions; e.g., the one with the same color/shape), continuous performance test (pressing a key only when specific letters are displayed while different letters appear randomly), and facial expression recognition test (evaluating the match between the facial expression of person in a photo and a description of facial expression, such as calm or sad).

Japanese version of Pittsburgh Sleep Quality Index Japanese version (PSQI-J)

The sleep evaluation scale enables sleep quality to be comprehensively assessed and rated based on self-reporting. It has accumulated the most evidence among the varied sleep evaluation tests.

Test participants are asked about their sleep over the previous month. If a score is six or more, participants are determined to have a sleep disorder.