



LETTER TO THE EDITOR

Foot care using green tea paste for behavioral and psychological symptoms in dementia patients

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Dear Editor,

Instead of antipsychological medicines for behavioral and psychological symptoms in dementia patients (BPSD), many other medicines^{1,2} and care^{3,4} have been investigated to effectively subside BPSD. Under the circumstance of an increasing number of self-care-dependent older people, most of them suffering dementia, and a shortage of care workers, the optimal cost performance of care for both patients and care workers should be researched.

Taking a bath is one of the favored cares for older patients. However, taking a bath is usually limited to once or twice a week because of a shortage of care workers. In Japan, a foot care custom has been performed since the Edo era to greet guests at inns. Foot care is easily performed without heavy burdens to both self-care-dependent older people and care workers as compared to taking a bath. In order to estimate the effectiveness of foot care for patients with BPSD, foot care was performed for patients with BPSD. Because used green tea is a useful tool for management of tinea manuum⁵ and smell of contracted hand grip,⁶ foot care combined with used green tea paste was adopted.

Foot care was performed in the bathroom or at the bedside depending on the activities of daily living (ADL). Both legs and feet were dipped into hot water at 40–41°C in a plastic tub 40 cm wide, 30 cm deep and 10 L in volume for 10 min and the legs and feet were covered with green tea paste. The green tea paste was made from wasted green tea after commercial use in a green tea bottle in a tea company. The wasted green tea was dried and powdered and stocked in plastic bags. The wasted green tea was melted with hot water just before using as green tea paste. Five minutes later, foot massage was performed for 5 min. The green tea paste was rubbed on the legs and feet by massage. Finally, the green tea paste was washed out using fresh hot water and the legs and feet were wiped with a dry towel. Nails

were in need of care. It takes approximately 30 min to perform foot care. The actual work time of the care worker was 15 min.

We randomly assigned patients with BPSD into two groups using a random table. Patients suffering from a major medical illness such as neoplastic disease or acute inflammation were not involved in the present study. BPSD was assessed and evaluated using the Neuropsychiatric Inventory (NPI). NPI consists of 10 items of behavioral disturbances and on each item severity (1 = mild, 2 = moderate, 3 = severe) and frequency (1 = occasionally, less than once per week; 2 = often, approximately once per week; 3 = frequently, several times per week but less than every day; 4 = very frequently, once or more per day or continuously) were rated.⁷ NPI is calculated by the product of severity times frequency on each item and ranged 0–120 (lower scores indicate better performance). One group was treated with foot care ($n = 10$) and another group was not ($n = 12$). All patients were recruited from the long-term care Sendai Tomizawa Hospital, Sendai, Japan. The diagnosis of dementia was made according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria.⁸ The physical condition of all patients had been stable for the prior 3 months. At baseline, each patient received a uniform evaluation, including a medical history, physical and neurological examination, and brain computed tomography (CT) scan, as well as Mini-Mental State Examination (MMSE) to assess cognitive function⁹ and the Barthel Index for ADL (higher scores indicate better performance).¹⁰ Patients with dementia of either Alzheimer's disease or vascular dementia or a combination of both were involved. MMSE scores were less than 20 and concomitant BPSD with a NPI scores were more than 6 on delusion, hallucination, violent behavior or apathy subscales.

Twenty-two patients with moderate to severe dementia (eight men and 14 women; mean \pm standard

Table 1 Physical characteristics of patients

Group	Foot care	Control
Sex (M/F)	4/6	4/8
Age (years)	79 ± 11	80 ± 12
Diseases	7 AD, 2 VD 1 AD with CVD	8 AD, 2 VD 1 AD with CVD
Duration of illness (months)	18 ± 10	22 ± 11
NPI at baseline	32 ± 10	33 ± 13
MMSE at baseline	7 ± 7	8 ± 7
Barthel Index at baseline	46 ± 21	40 ± 23

AD, Alzheimer's disease; CVD, cerebrovascular disease; MMSE, Mini-Mental State Examination; NPI, Neuropsychiatric Inventory; VD, Vascular dementia.

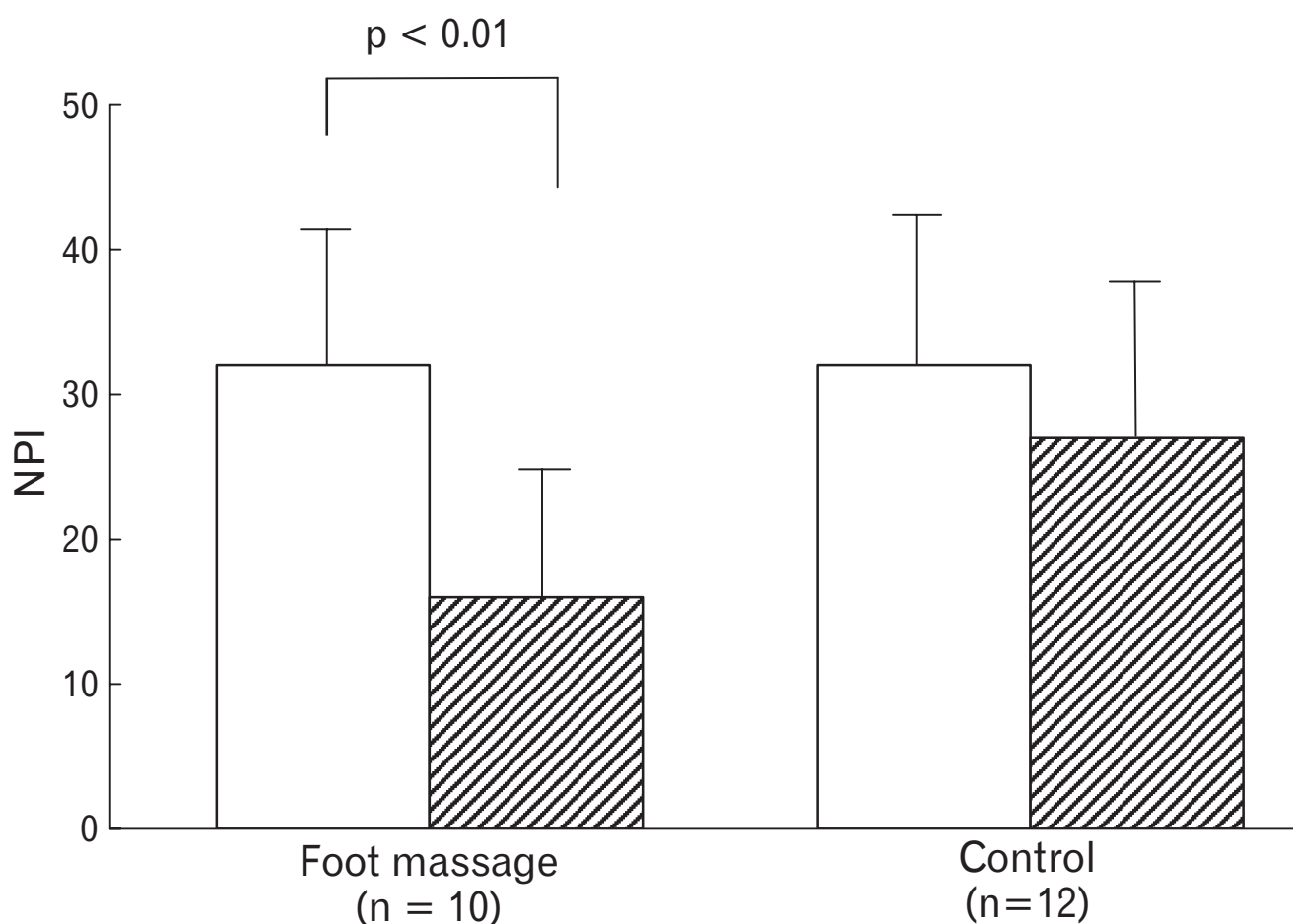


Figure 1 Neuropsychiatric Inventory (NPI) total scores of 10 patients in the foot care group and 12 controls at the study baseline and the end-point.

deviation [SD], 80 ± 12 years; MMSE 8 ± 7) were investigated. Written informed consent was obtained from participants and/or their families following a detailed explanation of the study. Tiapride hydrochloride (25 mg), a dopamine D₁ selective classical neuroleptic, was used as necessary.

Foot care was performed by care workers every evening at 07.00 hours after dinner except at twice a week when taking a bath and was continued for 4 weeks. A trained nurse, who did not know the intention of the study, directly observed the patients and performed the NPI, MMSE and Barthel Index tests. All

the scales were examined at baseline and the 4-week intervention. NPI, MMSE and Barthel Index results were analyzed using paired Wilcoxon tests. Results were considered to be statistically significant at $P < 0.05$. Data are expressed as the mean \pm SD.

Physical characteristics at baseline of patients are shown in Table 1. There was no significant difference in any parameters between the two groups. All participants in both groups completed the trial. Significant improvements in the score for NPI (from 32 ± 10 to 16 ± 9 , $P < 0.01$) were observed in the foot care group, where NPI in the control group (from 33 ± 13 to 27 ± 14) did not change significantly (Fig. 1). The Barthel Index did not significantly change in either group. In the NPI subscales, improvements in agitation/aggression, irritability/lability and aberrant motor activity were observed in the foot care group. MMSE did not change in either foot care group, from 7 ± 7 to 8 ± 8 and control group, from 8 ± 7 to 9 ± 8 . Tiapride hydrochloride (5 mg) was used in four patients in the foot care group and six patients in the control group. No treatment-emergent adverse events were seen in either group during the observation period.

Foot care was unexpectedly favored and appreciated by the patients. Some patients with BPSD asked the care workers to give foot care the next day and BPSD subsided after that. Foot care shows many benefits to the patients. Warming up by hot water increases blood flow of foot skin which might reduce an unpleasant feeling of coldness of feet in older patients. Foot massage might also increase blood flow of foot skin.¹¹ Foot massage might also relieve foot pain¹² and anxiety of patients,¹³ which might effect sleep.¹⁴ Foot massage was performed by care workers who were not massage specialists, but stimulation of the feet might benefit gait disorders.¹⁵ Foot care using green tea paste subsides foot germs⁵ and relieves foot smell.⁶ All of these combinational comfortable feelings stimulate the subsiding effects of subcortical structures of the limbic system (limbic lobe and deep-lying structures, which are supposed to be sources of BPSD) and might reduce BPSD.¹⁶ Furthermore, sincere foot treatment by care workers brings good feelings to the patients and opens their minds. Increased frequency of contact with the patients might be favored by the patients and foot care would be reasonable way to contact the patients. Usually patients with BPSD were angry because they were not treated properly. The cost of green tea paste was almost zero because wasted green tea is abandoned by companies after commercially producing green tea bottles. The touch to the skin especially in foot care is proper care with less cost and labor to both the patients with BPSD and care workers. Foot care provides less load to the body than taking a bath.

Foot care should be extended not only to patients with BPSD but also to many older patients who need engaged care.

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