

cognition-related items (Table 5), although it was associated in univariate analysis (Tables 2–4). Nutritional status was not associated with subjective memory impairment and disorientation by multiple logistic regression analysis either (Table 5).

Discussion

The present study showed that self-claiming memory impairment was associated with a wide range of awareness of functional decline. The results also showed that depressive mood was significantly associated with subjective cognitive impairment. Community studies in normally-aging populations suggest that depression is associated with cognitive decline.^{9–18} Older adults with depression often present with signs and symptoms indicative of functional or cognitive impairment. These

somatic symptoms make evaluating and treating depression in older adults more complex. Depression in late life is more frequently associated with cognitive changes. Cognitive impairment in late-life depression might be a result of a depressive disorder or an underlying dementing condition. Memory complaints are also common in older adults with depression. There is a wide range of cognitive impairment in late-life depression, including decreased central processing speed, executive dysfunction and impaired short-term memory. The etiology of cognitive impairment might include cerebrovascular disease, which likely interrupts key pathways between frontal white matter and subcortical structures important in mood regulation and structural changes, such as hippocampal atrophy.¹⁹ Depressive symptoms often coexist with dementia or MCI.⁴ In the current survey, the questionnaire asked for subjective answers regarding cognitive function. Hence, one cannot deny the possibility that depressive mood might have interfered with the self-assessment of one's own cognition.

Memory impairment and disorientation was associated with lower walking status. The association of physical activity and memory is well recognized.^{20,21} Also, an association between physical frailty and cognitive dysfunction has been reported.^{22,23} Physical frailty is associated with the risk of MCI and a rapid rate of cognitive decline in aging.²⁴ A lower level of fitness was associated with hippocampal atrophy,²⁵ and exercise training increased the hippocampal volume.²⁶ The current results were in agreement with these previous findings.

Table 1 Participants' backgrounds

| | |
|---------------------|--------------|
| <i>n</i> | 3814 |
| Age (years) | 75.1 (6.2) |
| Sex (male/female) | 1163/2651 |
| Body mass index | 22.5 (4.5) |
| Systolic BP (mmHg) | 134.0 (17.8) |
| Diastolic BP (mmHg) | 74.4 (11.0) |
| Hemoglobin (g/dL) | 12.8 (1.4) |
| Albumin (g/dL) | 4.2 (0.3) |

Mean (SD). BP, blood pressure.

Table 2 Differences between participants with or without memory impairment

| | No memory impairment | Memory impairment | <i>P</i> -value |
|-------------------------------------|----------------------|-------------------|-----------------|
| <i>n</i> | 2654 | 1160 | |
| Age (years) | 74.6 ± 6.0 | 76.2 ± 6.4 | <0.01 |
| Male (% of male) | 799 (30.1) | 364 (31.4) | 0.45 |
| Body mass index(kg/m ²) | 22.6 ± 4.7 | 22.4 ± 4.1 | 0.10 |
| Systolic BP (mmHg) | 134.2 ± 18.0 | 133.6 ± 17.4 | 0.33 |
| Diastolic BP (mmHg) | 74.5 ± 11.0 | 73.9 ± 10.9 | 0.12 |
| Hemoglobin (g/dl) | 12.8 ± 1.4 | 12.7 ± 1.4 | <0.01 |
| Albumin (g/dl) | 4.3 ± 0.3 | 4.2 ± 0.3 | 0.02 |
| IADL (0–7) | 5.8 ± 1.5 | 5.1 ± 1.8 | <0.01 |
| Walking status (0–5) | 2.8 ± 1.4 | 2.5 ± 1.3 | <0.01 |
| Depressive mood (0–5) | 1.3 ± 1.5 | 2.3 ± 1.7 | <0.01 |
| Dysphagia (0–3) | 1.5 ± 1.0 | 1.8 ± 1.0 | <0.01 |
| Vitality (0–2) | 1.6 ± 0.6 | 1.3 ± 0.7 | <0.01 |
| Nutrition (0–2) | 1.6 ± 0.6 | 1.5 ± 0.6 | 0.01 |

Mean ± SD. Age, body mass index, systolic and diastolic blood pressure (BP), hemoglobin and albumin were analyzed by Student's *t*-test. Sex was analyzed by χ^2 -test. Instrumental activities of daily living (IADL), walking status, depressive mood, dysphagia, vitality and nutrition were analyzed by Mann-Whitney *U*-test.

Table 3 Differences between participants with or without impairment in telephone function

| | No impairment | Impairment | <i>P</i> -value |
|--------------------------------------|---------------|--------------|-----------------|
| <i>n</i> | 3350 | 464 | |
| Age (years) | 74.9 ± 6.0 | 76.5 ± 7.2 | <0.01 |
| Male (% of male) | 981 (29.3) | 182 (39.2) | <0.01 |
| Body mass index (kg/m ²) | 22.5 ± 4.5 | 22.6 ± 4.8 | 0.88 |
| Systolic BP (mmHg) | 133.8 ± 17.8 | 135.7 ± 17.9 | 0.03 |
| Diastolic BP (mmHg) | 74.2 ± 10.9 | 75.21 ± 1.0 | 0.07 |
| Hemoglobin (g/dL) | 12.8 ± 1.4 | 12.9 ± 1.5 | 0.23 |
| Albumin (g/dL) | 4.2 ± 0.3 | 4.3 ± 0.4 | 0.85 |
| IADL (0–7) | 5.8 ± 1.4 | 4.1 ± 2.0 | <0.01 |
| Walking status (0–5) | 2.8 ± 1.4 | 2.4 ± 1.4 | <0.01 |
| Depressive mood (0–5) | 1.6 ± 1.6 | 2.2 ± 1.8 | <0.01 |
| Dysphagia (0–3) | 1.6 ± 1.0 | 1.6 ± 1.0 | 0.73 |
| Vitality (0–2) | 1.5 ± 0.6 | 1.3 ± 0.7 | <0.01 |
| Nutrition (0–2) | 1.6 ± 0.6 | 1.6 ± 0.6 | 0.72 |

Mean ± SD. Age, body mass index, systolic and diastolic blood pressure (BP), hemoglobin and albumin were analyzed by Student's *t*-test. Sex was analyzed by χ^2 -test. Instrumental activities of daily living (IADL), walking status, depressive mood, dysphagia, vitality and nutrition were analyzed by Mann–Whitney *U*-test.

Table 4 Differences between participants with or without disorientation

| | No impairment | Impairment | <i>P</i> -value |
|--------------------------------------|---------------|--------------|-----------------|
| <i>n</i> | 2550 | 1264 | |
| Age (years) | 74.7 ± 5.9 | 76.0 ± 6.7 | <0.01 |
| Male (% of male) | 743 (29.1) | 420 (33.2) | 0.01 |
| Body mass index (kg/m ²) | 22.7 ± 4.7 | 22.3 ± 4.1 | 0.01 |
| Systolic BP (mmHg) | 134.2 ± 17.7 | 133.7 ± 18.0 | 0.49 |
| Diastolic BP (mmHg) | 74.6 ± 10.7 | 73.9 ± 11.4 | 0.09 |
| Hemoglobin (g/dL) | 12.8 ± 1.4 | 12.8 ± 1.4 | 0.84 |
| Albumin (g/dL) | 4.3 ± 0.3 | 4.2 ± 0.3 | 0.02 |
| IADL (0–7) | 5.8 ± 1.5 | 5.1 ± 1.8 | <0.01 |
| Walking status (0–5) | 2.8 ± 1.4 | 2.6 ± 1.4 | <0.01 |
| Depressive mood (0–5) | 1.3 ± 1.5 | 2.3 ± 1.7 | <0.01 |
| Dysphagia (0–3) | 1.5 ± 1.0 | 1.8 ± 1.0 | <0.01 |
| Vitality (0–2) | 1.5 ± 0.6 | 1.3 ± 0.7 | <0.01 |
| Nutrition (0–2) | 1.6 ± 0.6 | 1.5 ± 0.6 | 0.02 |

Mean ± SD. Age, body mass index, systolic and diastolic blood pressure (BP), hemoglobin and albumin were analyzed by Student's *t*-test. Sex was analyzed by χ^2 -test. Instrumental activities of daily living (IADL), walking status, depressive mood, dysphagia, vitality and nutrition were analyzed by Mann–Whitney *U*-test.

Awareness of lower IADL was significantly associated with subjective cognitive impairment. This finding is conceivable, given that IADL requires complex cognitive function, and becomes vulnerable in early stages of cognitive decline.^{27–29}

Univariate analysis showed that vitality was associated with awareness of subjective cognitive declines; however, multiple logistic analysis did not show a significant association with subjective cognitive dys-

function in the current study. The exclusion of depressive mood from the multiple regression analysis models made both vitality and nutrition significantly associated with cognition-related items (data not shown). The association of vitality with subjective cognitive declines might be at least partly through depressive mood. Toba *et al.* reported that vitality was impaired in the elderly with cognitive impairment.³⁰ That study involved more severely

Table 5 Results of multiple logistic regression analysis

| | Memory | Telephone | Orientation | P-value | 95% CI | P-value | 95% CI | P-value |
|-----------------|------------|------------|-------------|---------|-------------|---------|-------------|---------|
| | Odds ratio | Odds ratio | Odds ratio | | | | | |
| Age | 1.021** | 0.994 | 1.011 | <0.01 | 0.997-1.011 | 0.48 | 0.999-1.023 | 0.08 |
| Sex | 1.013 | 0.769* | 0.888 | 0.88 | 0.612-0.965 | 0.02 | 0.758-1.042 | 0.15 |
| IADL | 1.125** | 1.824** | 1.154** | <0.01 | 1.693-1.966 | <0.01 | 1.088-1.224 | <0.01 |
| Walking status | 1.072* | 1.043 | 1.065* | 0.03 | 0.954-1.140 | 0.36 | 1.003-1.131 | 0.04 |
| Depressive mood | 1.283** | 1.075* | 1.298** | <0.01 | 1.005-1.151 | 0.04 | 1.237-1.361 | <0.01 |
| Dysphagia | 1.342** | 1.027 | 1.300** | <0.01 | 0.914-1.153 | 0.66 | 1.199-1.410 | <0.01 |
| Vitality | 1.061 | 1.048 | 1.005 | 0.44 | 0.880-1.248 | 0.60 | 0.866-1.166 | 0.95 |
| Nutrition | 1.050 | 0.929 | 1.095 | 0.43 | 0.782-1.104 | 0.41 | 0.975-1.229 | 0.13 |

** $P < 0.01$; * $P < 0.05$. IADL, Instrumental activities of daily living.

cognitively impaired participants than the current study, which might be a reason of the discrepancy with the current study.

Univariate analysis showed an association between nutritional status and awareness of cognitive declines (memory and orientation); however, multiple regression analysis did not. This might also be a result of adjustment for depressive mood.

The present finding that dysphagia was associated with memory impairment and disorientation is not in agreement with a recent study showing that memory was not associated with dysphagia.³¹ In the current study, we could not obtain information about the comorbidity of the interviewees. Therefore, one can speculate that the difference in the rate of stroke prevalence might explain the discrepancy. The observed discrepancy requires further substantiation.

The association of subjective cognitive impairment and a wide range of awareness of functional declines might suggest that these functional impairments may share a common pathology, which leads to a construction of complex interactions among symptoms of geriatric syndrome or frailty syndrome.

The current study suggested that subjective cognitive impairment assessed by a relatively simple questionnaire was associated with a wide range of functional decline in older adults at high risk for care need. Therefore, screening for subjective cognitive impairment in this population might be valid for the early detection of dementia and other functional declines.

Acknowledgment

Authors thank the city of Nagoya for cooperation in the current study.

Disclosure statement

None of the authors have personal or financial conflicts of interest with regard to this manuscript.

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ORIGINAL ARTICLE: BEHAVIORAL
AND SOCIAL SCIENCES

Day-care service use is a risk factor for long-term care placement in community-dwelling dependent elderly

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Aims: To identify predictors of long-term care placement and to examine the effect of day-care service use on long-term care placement over a 36-month follow-up period among community-dwelling dependent elderly.

Methods: This study was a prospective cohort analysis of 1739 community-dwelling elderly and 1442 caregivers registered in the Nagoya Longitudinal Study for Frail Elderly. Data included the clients' demographic characteristics, basic activities of daily living, comorbidities, and use of home care services, including the day-care, visiting nurse, and home-help services, as well as caregivers' demographic characteristics and care burden. Analysis of long-term care placement over 36 months was conducted using Kaplan–Meier curves and multivariate Cox proportional hazards models.

Results: Among the 1739 participants, 217 were institutionalized at long-term care facilities during the 36-month follow-up. Multivariate Cox regression models, adjusted for potential confounders, showed that day-care service use was significantly associated with an elevated risk for long-term care placement within the 36-month follow-up period. Participants using a day-care service two or more times/week had significantly higher relative hazard ratios than participants not using such a service.

Conclusion: The results highlight the need for effective measures to reduce the long-term care placement of day-care service users. Policy makers and practitioners must consider implementing multidimensional support programs to reduce the caregivers' willingness to consider long-term care placement. *Geriatr Gerontol Int* 2012; 12: 322–329.

Keywords: community, day-care service, elderly, long-term care placement, nursing home.

Introduction

Japan introduced a universal-coverage long-term care insurance (LTCI) program in April 2000.^{1,2} This program brought a radical change from traditional, family-based care toward elderly care involving socialization and the integration of medical care and welfare

Accepted for publication 15 September 2011.

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services. There are two types of services covered by LTCI: community-based services and institutional services. Community-based services include various programs such as the home-help service, visiting bathing service, visiting rehabilitation, day care (rehabilitation), visiting nurse service, assistive device leasing, short stays (temporary stays at nursing facilities), in-home medical care, and care management services, care services provided by for-profit private homes, and allowance for the purchase of assistive devices and home renovation. In theory, the applicant can choose any certified providers and listed services.

In practice, a major role is played by a "care manager," a licensed professional who has passed an examination and undergone brief training, who draws up a care plan and a weekly schedule of service provision for individual seniors. It is essential that the care plan must be approved by the client or the client's family, and new care managers can be requested at any time if care plans prove inadequate. The maximum amount of reimbursement in the LTCI system is capped according to the care level.^{3,4} Elderly beneficiaries pay a 10% co-payment for services received.

The aims of LTCI home care programs are to reduce the care burden of caregivers, maintain and improve the functional abilities and well-being of elderly people, and decrease the use of institutional care services and mortality. However, there is little evidence of how community-based services affect care recipients' outcomes, the subjective burden of caregivers or reduce the use of institutional care services.

The Nagoya Longitudinal Study for Frail Elderly (NLS-FE) compares outcomes of the use of different care services provided by the LTCI program; it was designed to provide a structured comparison of services and a comprehensive standardized assessment instrument.^{5,6} Day-care service, which includes "day care" and "day rehabilitation," is provided in designated centers and is one of the major LTCI community-based services. Day-care service is a facility-based daytime program of nursing care, rehabilitation therapies, supervision and socialization that enables frail, older people, who are in poor overall health and have multiple comorbidities and varying physical or mental impairments, to remain active in the community. The individual visits the facility once or several times a week and then returns to his or her own home.

Although one of the aims of day-care service is to minimize or delay the possibility of institutionalization and maximize the potential for care recipients to maintain an independent life in the community, only a limited number of studies have examined the impact of day-care service on long-term care (LTC) placement among community-dwelling older adults. Moreover, most of these studies have targeted patients with dementia. Previous studies targeting dementia have

demonstrated that day-care use is associated with nursing home placement in persons with Alzheimer's disease.^{7,8} However, the effect of using day-care service on the LTC placement of community-dwelling, frail elderly with various chronic diseases remains unknown, although it has been reported that day-care services reduce caregiving time and provide respite to caregivers.^{9,10}

In the present prospective cohort study using the NLS-FE cohort, we examined whether day-care service use among community-dwelling older people using various community-based services under LTCI in Japan influenced LTC placement during a 36-month follow-up period. Analysis of LTC placement over the 36-month was conducted using Kaplan-Meier curves and multivariate Cox proportional hazards models.

Methods

Subjects

The present study employed baseline data of the participants in the NLS-FE and data on the mortality of these patients during the 36-month follow-up. Details of participants and the NLS-FE have been published elsewhere.^{5,6} The study population initially consisted of 1875 community-dwelling dependent elderly (632 men and 1243 women, age 65 years or older) who were eligible for LTCI, lived in Nagoya City and received various home care services from the Nagoya City Health Care Service Foundation for Older People, which has 17 visiting nursing stations associated with care-managing centers. These NLS-FE participants, who were enrolled between 1 December 2003 and 31 January 2004, were scheduled to undergo comprehensive in-home assessments by trained nurses at the baseline and at 6, 12, 24, and 36 months. At 3-month intervals, data were collected about any events participants experienced, including admission to the hospital, LTC admission and mortality. Per the procedures approved by the institutional review board of Nagoya University Graduate School of Medicine, participants provided written informed consent and, for those with substantial cognitive impairment, a surrogate (usually the closest relative or legal guardian) or family caregivers provided it.

Data collection

Data were collected from standardized interviews with patients or surrogates and caregivers conducted at clients' homes and from care-managing center records by trained nurses. The data included clients' demographic information, depressive symptoms as assessed by the short version of the Geriatric Depression Scale (GDS-15),¹¹ and a rating for the seven basic activities of daily living (ADL) (feeding, bathing, grooming, dressing, using the toilet, walking, and transferring) using

summary scores ranging from 0 (total disability) to 20 (no disability).¹² The interview with participants also included questions about using care services, including day-care service, which includes day care and day rehabilitation, visiting nurse service, and home-help service programs, as well as medical services. In addition, the weekly frequency with which clients used these services was obtained.

Information obtained from care-managing center records included data on the following physician-diagnosed chronic conditions: ischemic heart disease, congestive heart failure, cerebrovascular disease, diabetes mellitus, dementia, cancer, and other diseases comprising the Charlson comorbidity index,¹³ which represents the sum of a weighted index that takes into account the number and seriousness of preexisting comorbid conditions.

Data were also obtained from caregivers concerning their own personal demographic characteristics and their subjective burden as assessed by the Japanese version of the Zarit Burden Interview (ZBI),¹⁴ which is a 22-item self-report inventory that examines the burden associated with functional behavioral impairments in the home care situation.

For the analysis, 136 of the original 1875 participants were excluded because of missing data regarding service use or confounding/intermediary variables, leaving 1739 in the analysis. Of these 1739 participants, 412 could not complete the GDS-15 because of severe cognitive impairment or communication impairment. Also, among the 1739 older participants, 1442 participants had primary caregivers. Of these 1442 caregivers, 289 could not or refused to complete the ZBI.

We defined three types of care facilities providing LTCI as LTC facilities: nursing homes, care health facilities for the elderly, and group homes for elders with dementia. We assessed LTC placement over 36 months using event reports at 3-month intervals. LTC placement was confirmed by visiting nurses or care-managing center records. Placement time was defined as the number of months (3-month intervals) between the baseline interview and the event report of LTC placement. We censored participants living at home after 36 months of follow-up ($n = 773$), at death ($n = 401$), or at dropout ($n = 248$).

Statistic analysis

The Student's *t*-test and χ^2 test were used to compare differences at baseline between users and nonusers of day-care service. To create ideal model, we first evaluated the association between each covariate and LTC placement using univariate Cox proportional hazards model. LTC placement over 36 months was estimated for each group (day-care service use once or multiple times per week, and nonusers) using the Kaplan–Meier

method. We then evaluated the impact of day-care service use and weekly frequency of service use on the overall model with a series of Cox proportional hazards models, which included gender, age, ADL status, presence or absence of dementia, and caregiver's sex, age and ZBI score. The risk of a variable was expressed as a hazard ratio (HR) with a corresponding 95% CI. All analyses were performed using the SPSS v. 11 (Chicago, IL, USA). $P \leq 0.05$ was considered significant.

Results

When the baseline characteristics were compared between day-care service users and nonusers, older age, a higher Charlson comorbidity index, and a lower GDS-15 score were observed in day-care service users than in nonusers (Table 1). Higher prevalence rates of cerebrovascular disease and dementia were also observed in day-care service users. The rates of nursing service use, home-help service use and living alone among day-care service users were lower than those of nonusers. Among caregivers' variables, the rate of male caregivers was significantly lower for day-care service users than nonusers. Higher ZBI score was detected in users' caregivers.

Among the 1739 participants, 217 participants were institutionalized at LTC facilities during the 36-month follow-up period. A higher rate of LTC placement was observed in day-care service users than in nonusers ($n = 143$, 18.5% vs. $n = 74$, 7.7%, $P < 0.001$) (Table 1). Among the 1327 participants who could complete the GDS-15, 150 participants were institutionalized at LTC facilities during the 36-month follow-up period. Of the 412 who could not perform the GDS-15, 67 were institutionalized at LTC facilities during the 36-month follow-up period. A higher LTC placement rate was observed in the participants who could not complete GDS-15 test than in those who could (16.3% vs. 11.3%, $P = 0.008$). There were no significant differences in LTC placement rate between participants living alone and those living with others (12.8% vs. 12.4%, $P = 0.802$). Furthermore, there was no significant difference in the LTC placement rate between participants living with caregivers who completed the ZBI and those who did not (13.0% vs. 11.1%, $P = 0.375$).

Cox hazard regression and Kaplan–Meier models

Table 2 shows the results of the unadjusted univariate Cox hazard regression analysis, which suggested that LTC placement within the 36-month follow-up period was associated with older age, a lower function of basic ADL, day-care service use, and the presence of dementia (Table 2). Among caregivers' variables, only higher care burden was associated with LTC placement. Figure 1A shows Kaplan–Meier curves exploring the

Table 1 Baseline characteristics of the 1739 care recipients and the 1442 caregivers

| | Day-care service User | Nonuser | <i>P</i> -value |
|---|--------------------------|----------------|-----------------|
| Care recipients (<i>n</i> = 1739) | | | |
| Men/women (% of men/total) | 256/518 (33.1) | 319/646 (33.1) | 0.994 |
| Age, years (mean, SD) [†] | 81.4 (7.7) | 80.2 (7.5) | 0.002 |
| Basic ADL, range: 0–20 (mean, SD) [†] | 13.0 (5.9) | 13.5 (6.7) | 0.099 |
| Charlson comorbidity index, range: 0–35 (mean, SD) [†] | 2.2 (1.5) | 1.8 (1.6) | <0.001 |
| GDS-15 (range: 0–15), mean (SD) ^{‡§} | 6.1 (3.6) | 6.8 (3.7) | 0.002 |
| Chronic diseases (% of total) | | | |
| Ischemic heart disease | 12.4 | 12.0 | 0.809 |
| Congestive heart failure | 8.7 | 8.4 | 0.845 |
| Cerebrovascular disease | 42.8 | 27.6 | <0.001 |
| Diabetes mellitus | 12.4 | 11.7 | 0.659 |
| Dementia | 44.2 | 22.6 | <0.001 |
| Cancer | 8.0 | 10.1 | 0.142 |
| Visiting nurse service use (% of total) | 38.1 | 54.0 | <0.001 |
| Home-help service use (% of total) | 42.4 | 50.5 | 0.001 |
| Regular medical checkups (% of total) | 55.3 | 60.7 | 0.023 |
| Living alone (% of total) | 17.3 | 28.1 | <0.001 |
| Hospitalization during 36-month follow-up (% of total) | 42.5 | 41.0 | 0.537 |
| Long-term care placement during 36-month follow-up (% of total) | 18.5 | 7.7 | <0.001 |
| Caregiver variables (<i>n</i> = 1442) | | | |
| Men/women (% of men/total) | 137/553 (19.9) | 217/535 (28.9) | <0.001 |
| Age (years), mean (SD) [†] | 63.4 (12.3) | 64.3 (12.4) | 0.177 |
| Relationship to care recipient (% of total) | | | |
| Spouse | 35.4 | 42.8 | |
| Child | 35.8 | 37.1 | <0.001 |
| Daughter-in-law | 25.7 | 15.4 | |
| Others | 3.2 | 4.7 | |
| ZBI score, range: 0–88 (mean, SD) ^{‡§} | 30.1 (16.8) | 26.8 (17.0) | 0.001 |

[†]Student's *t*-test, others were analyzed by χ^2 test (user vs. nonuser). [‡]GDS-15, geriatric depression scale, *n* = 1327. [§]ZBI, the Zarit Burden Interview. *n* = 1153.

association between weekly frequency of day-care service use and time to LTC placement (3-month intervals). The risk of LTC placement was higher for participants who used day-care service more frequently than those who used it less frequently.

Table 3 shows the results of the series of Cox proportional hazards models that examine the HR of day-care service use to LTC placement during the 36-month follow-up period. The sequential adjustment had minor influences on the association between day-care service use and LTC placement during the 36-month follow-up period. The HR for the fully adjusted models was 2.34 (95% CI = 1.60–3.41).

In the Cox regression model adjusted for potential confounders, participants with more frequent use of day-care service had a significantly higher relative HR than participants with less frequent use of the service (Fig. 1B). Although there was no significant association between using day-care service once per week and the

risk of LTC placement, participants using a day-care service two or more times per week had a significantly higher relative HR than participants not using the service.

Discussion

In the present study we demonstrated that day-care service use was associated with LTC placement during the 36-month study period among community-dwelling frail elderly using various community-based services under the LTCI program in Japan. Many previous studies have examined predictors of LTC placement in study samples, but these have been limited to people with dementia and there have been fewer evaluations of risk factors for LTC placement in community samples.^{15–19} Few studies have comprehensively investigated how both caregiver and recipient characteristics influence LTC placement.¹⁹ Previous observations

Table 2 Univariate Cox proportional hazards model to identify predictors of long-term care placement over 36 months

| Variable | Univariate | | P-value |
|--|-----------------|-----------|---------|
| | HR [†] | 95% CI | |
| Care recipients (<i>n</i> = 1739) | | | |
| Men (vs. women) | 0.75 | 0.56–1.02 | 0.067 |
| Age (continuous) | 1.04 | 1.03–1.06 | <0.001 |
| Living with someone (vs. living alone) | 1.02 | 0.74–1.39 | 0.920 |
| Basic ADL (range: 0–20) (continuous) | 0.97 | 0.95–0.99 | 0.001 |
| Regular medical checkups per month (no regular checkup) | 1.19 | 0.90–1.56 | 0.214 |
| Formal care use (vs. nonuse) | | | |
| Visiting nurse | 1.15 | 0.88–1.51 | 0.295 |
| Day-care service | 2.42 | 1.83–3.21 | <0.001 |
| Home helper | 0.71 | 0.81–1.37 | 0.714 |
| Charlson comorbidity index (continuous) | 1.04 | 0.95–1.13 | 0.375 |
| GDS-15 (continuous) [†] | 1.01 | 0.96–1.05 | 0.762 |
| Presence of chronic diseases (vs. absence) | | | |
| Ischemic heart disease | 1.02 | 0.68–1.53 | 0.926 |
| Congestive heart failure | 1.16 | 0.73–1.84 | 0.523 |
| Cerebrovascular disease | 1.00 | 0.76–1.32 | 0.986 |
| Diabetes mellitus | 0.78 | 0.50–1.22 | 0.272 |
| Dementia | 3.00 | 2.29–3.92 | <0.001 |
| Cancer | 0.84 | 0.49–1.44 | 0.520 |
| Hospitalization during 36-month follow-up (vs. never admitted) | 1.08 | 0.82–1.42 | 0.576 |
| Caregiver variables (<i>n</i> = 1442) | | | |
| Men (vs. women) | 0.95 | 0.67–1.33 | 0.752 |
| Age (continuous) | 1.01 | 1.00–1.02 | 0.059 |
| Character of caregiver (vs. child) | | | |
| Spouse | 0.90 | 0.64–1.28 | 0.555 |
| Daughter-in-law | 1.29 | 0.88–1.88 | 0.189 |
| Others | 1.21 | 0.60–2.43 | 0.596 |
| ZBI score(continuous) [‡] | 1.03 | 1.02–1.04 | <0.001 |

[†]GDS-15, geriatric depression scale, *n* = 1327. [‡]ZBI, the Zarit Burden Interview. *n* = 1153. HR, hazard ratio.

demonstrated that common risk factors of LTC placement of community-dwelling elderly were older age, presence of dementia, and caregiver's burden.^{16,18,19}

Although one of the aims of day-care service is to minimize or delay the possibility of institutionalization and maximize the potential for care recipients to maintain an independent life in the community, only a limited number of studies have examined the impact of day-care service on LTC placement among community-dwelling older adults – and most of these have targeted demented patients. Previous studies targeting dementia have demonstrated that day-care use is associated with nursing home placement in persons with Alzheimer's disease.^{7,8} We expanded the target group and demonstrated a striking association between day-care service use and the risk of LTC placement for community-dwelling dependent elderly patients with various chronic diseases, even after adjusting for the presence of dementia and caregiver's burden. We clearly showed,

after adjusting for potential confounders, that the frequency of day-care service use had a negative impact on LTC admission with the 36-month follow-up period. The use of day-care service two or more times per week negatively affected LTC placement, but there was no significant association between institutionalization and the use of day-care service once a week. It is possible that participants with more comorbidities and a more depressive mood use day-care service more frequently; thus, participants using a day-care service two or more times per week were more likely to be placed in LTC facilities. However, even if comorbidity index score and GDS-15 score were included in the analysis, the association between LTC placement and the use of day-care service two or more times per week persisted (data not shown). This contrasts with our recent report that the risk of 21-month mortality among community-dwelling elderly was reduced significantly with frequent use of day-care service.⁶ The complex decision to place older

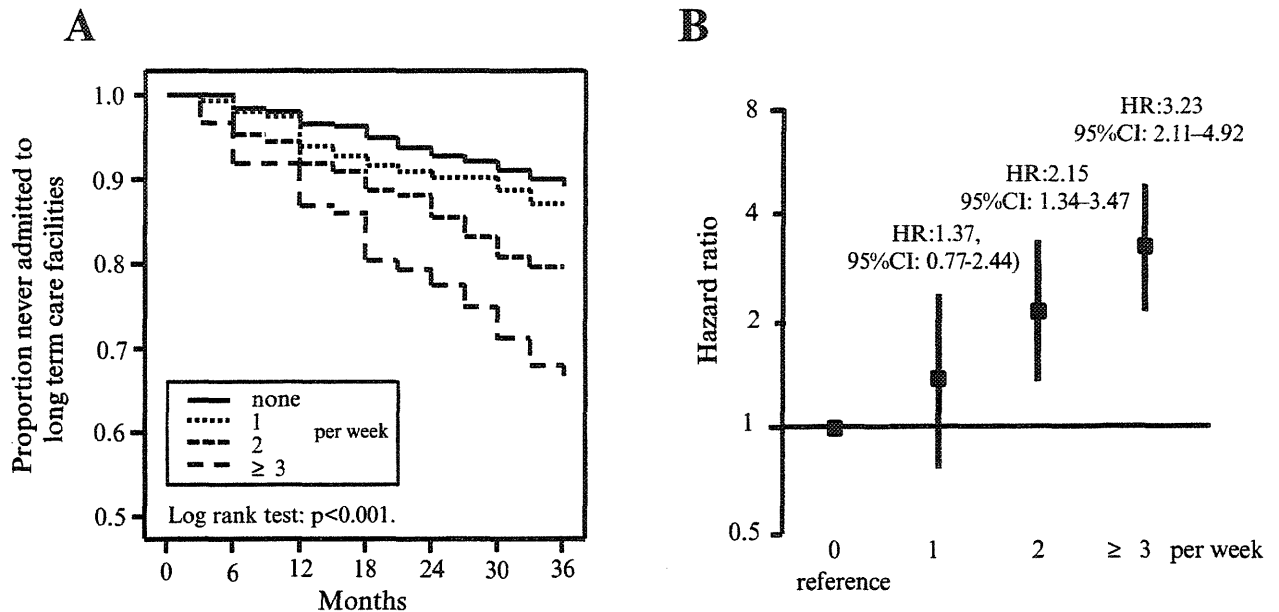


Figure 1 (A) Kaplan–Meier estimates of long-term care (LTC) placement over 36 months according to the frequency of day-care service use (times per week). The log-rank test: $P < 0.001$. (B) Risk of LTC placement based on the frequency of day-care service use (times per week), adjusting for potential confounders (recipient's gender, age, ADL status, presence or absence of dementia, caregiver's gender, age, and Zarit Burden Interview score). The y-axis is the adjusted hazard ratios (HR) on a log scale. Black squares are point estimates from a Cox proportional hazards model adjusting for potential confounders. The error bars represent 95% CI. A simple black square without confidence intervals represented the referent group, nonusers.

Table 3 Hazard ratios for long-term care placement associated with day-care service use (multivariate models)

| Models | Hazard ratio | 95% CI | P-value |
|------------------------|--------------|-----------|---------|
| Model 1 ($n = 1739$) | 2.32 | 1.75–3.08 | <0.001 |
| Model 2 ($n = 1739$) | 1.96 | 1.47–2.62 | <0.001 |
| Model 3 ($n = 1150$) | 2.34 | 1.60–3.41 | <0.001 |

Model 1 includes recipient gender and age. Model 2 includes recipient gender, age, ADL score, and presence or absence of dementia. Model 3 includes variables used in model 2 and caregiver's gender, age and Zarit Burden Interview score.

people in LTC is based on care recipient and caregiver characteristics and the sociocultural context of the recipient and caregiver. We do not know the exact reason for this negative effect of day-care service on LTC placement. There are conflicting findings in regard to the effect of day-care service on caregivers' stress, depression, subjective or objective burden, and physical and emotional well-being,^{9,10} although a recent relatively large study demonstrated that day-care service had a beneficial effect on restricting caregiving time and providing respite to caregivers.^{9,10} It is possible that day-care service alone cannot satisfy the complex needs of caregivers and care recipients sufficiently to enable continued home care, and it is unlikely to change the caregiver's preference for institutional placement.²¹ Although we still do not know whether the character-

istics of caregivers and recipients, or day-care service use itself, increase the risk of LTC placement, the relief and improved mental and physical well-being of caregivers following day-care service use may enhance the willingness of caregivers to consider LTC placement. Caregivers who use day-care service or other respite services may become more aware of their level of stress and more willing to consider LTC placement as an acceptable option, especially if the service experience is positive or if the caregiver receives encouragement to institutionalize from professionals or other caregivers.²²

This study has important limitations. First, the study was not a randomized intervention trial. Japan has introduced the LTCI program, which provides various services, including day-care services, according to clients' preferences. Therefore, we could not randomize the use

of this service. Because of the observational design of the present study, differences in unmeasured factors including the severity of patients' chronic diseases, caregivers' health conditions, and quality of services may account in part for the findings. Those who use formal services may have greater need for caregiving than those who do not use formal services. The unmeasured needs that contribute to day-care service use may be stronger than the positive effects of service. Other aspects of the present study should also be considered. In the analysis, baseline data of service use was included, but changes in service use during the follow-up period were not considered. Our results may not be representative of the Japanese frail elderly in the community as a whole because the subjects in this study represented an urban population. In addition, these findings may not be generalizable to other populations given that local health practices, a variety of social and economic factors, ethnic attitudes about caring for very old people, and cost/access to day-care centers may have influenced these results.

In the present study, we showed that day-care service does not achieve the LTCI program aim of reducing the use of institutional care services of elderly people to enable them to maintain their lives at home. It may be possible that the respite for caregivers provided by day-care service is not enough to continue caregiving at home. As is true for any observational study, we cannot firmly establish a cause-and-effect relationship between day-care service use and LTC placement. In addition, the present study could not evaluate the exact reasons for the unfavorable effect of this service on LTC placement. Further studies are needed to determine why caregiving families decide to use day-care services, reasons for LTC placement, and whether day-care services meet the needs of families and care recipients throughout the caregiving career. In addition, future research should assess the quality of day-care programs and examine whether the quality of day-care services affects the LTC placement of clients. Health-care providers and care managers should recognize that day-care service use may augment LTC placement in dependent older people. Policy makers and practitioners should consider implementing a multidimensional support program to reduce caregivers' willingness to consider LTC placement.

Acknowledgments

The authors wish to thank all the patients, caregivers and the many nurses participating in the study as well as the Nagoya City Health Care Service Foundation for Older People for its vigorous cooperation. This work was supported by a Grant-in-Aid for Comprehensive Research on Aging and Health from the Ministry of Health, Labour and Welfare of Japan and a grant from the Mitsui Sumitomo Insurance Welfare Foundation.

Disclosure statement

The authors have no conflicts of interest with any of the manufacturers of medications evaluated in this paper.

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介護予防事業における食事摂取状況と 関連要因の検討

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1. 緒言

近年、わが国では平均寿命の延長に伴い老年期が長くなっている。簡易生命表（厚生労働省）によると、2009年の平均寿命（0歳余命）は男性79.59歳、女性86.44歳である¹⁾。また総務省統計局により2011年度の推計人口が発表されたが、それによると老年人口（65歳以上）割合が23.4%（対前年比増加傾向）と過去最高になる²⁾。

このような高齢化と長寿社会の中で、高齢者自身が「いかに健康で、生きがいを持ち、自分らしく生きていけるか」は、極めて重要な現代的課題といえる³⁾。高齢者の栄養状態は、住居環境、生活習慣、社会参加、口腔機能、精神状態などの要因によって左右されると言われている。そして、栄養状態の低下は日常生活活動の低下をもたらす。QOLの低下につながる。

本研究では、地域支援事業における特定高齢者を対象として、高齢者の生活習慣と食事摂取状況との関連を調べるために、生活習慣が高齢者の食事摂取状況に及ぼす影響の検討を行った。

2. 方法

本学が愛知県日進市より業務委託を受け、3ヶ月間を1クールとした教室（約2週間に1回）を開催し、「口腔機能向上事業」「栄養改善事業」を同時に行った。

調査対象は地域支援事業における特定高齢者87名（男性28名、女性59名）、平均年齢73.9 ± 0.9歳）である。

この臨床疫学研究は観察研究の範疇に属し、名古屋学芸大学倫理委員会の承認のもとで実施した。

調査項目は、年齢、性、栄養状態（身体計測）、食事調査（食物摂取頻度調査票：FFQg：Food Frequency Questionnaire Based on Food Groups）、生活習慣調査である。

身体計測項目としては、身長、体重、BMI（Body Mass Index）、体脂肪率、上腕周囲長：AC（Arm Circumference）、上腕三頭筋皮下脂肪厚：TSF（Triceps Skinfold Thickness）、握力を実施した。

食事調査項目としては、エネルギー、たんぱく質、脂質、炭水化物、ナトリウム、カリウム、カルシウム、マグネシウム、リン、鉄、亜鉛、銅、マンガン、βカロテン当量、レチノール当量、ビタミンD、トコフェロール当量、ビタミンK、ビタミンB₁、ビタミンB₂、ナイアシン、ビタミンB₆、ビタミンB₁₂、葉酸、パントテン酸、ビタミンC、飽和脂肪酸、一価不飽和脂肪酸、多価不飽和脂肪酸、コレステロール、食物繊維、食塩、脂肪酸総量の栄養素について、FFQgを用いて実施した。FFQgとは、食品群別に分けられた29の食品グループと、10種類の調理方法から構成された簡単な質問により日常の食事（1～2ヶ月程度）内容を評価するものである⁴⁻⁶⁾。

生活習慣調査項目は、同居家族の有無、運動習慣の

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図表 1 睡眠習慣 (睡眠が十分である者) と栄養素の相関

| | 睡眠 (十分) n=71 | | p |
|----------------------------|---------------|--------------|-------|
| | 睡眠 (不十分) n=15 | | |
| | mean (± SD) | mean (± SD) | |
| エネルギー (kcal) † | 1815 ± 471 | 1622 ± 433 | 0.211 |
| たんぱく質 (g) † | 65.4 ± 21.1 | 60.2 ± 20.3 | 0.360 |
| 脂質 (g) † | 54.6 ± 20.9 | 47.7 ± 18.8 | 0.262 |
| 炭水化物 (g) † | 255.8 ± 58.6 | 230.1 ± 54.2 | 0.129 |
| ナトリウム (mg) † | 4031 ± 1252 | 3882 ± 1337 | 0.680 |
| カリウム (mg) † | 2471 ± 787 | 2040 ± 647 | 0.043 |
| カルシウム (mg) † | 654 ± 244 | 541 ± 226 | 0.124 |
| マグネシウム (mg) † | 258 ± 84 | 229 ± 76 | 0.202 |
| リン (mg) † | 1034 ± 329 | 912 ± 288 | 0.200 |
| 鉄 (mg) † | 7.9 ± 2.7 | 7.3 ± 2.9 | 0.363 |
| 亜鉛 (mg) † | 7.7 ± 2.3 | 7.0 ± 1.9 | 0.325 |
| 銅 (mg) † | 1.11 ± 0.33 | 1.02 ± 0.27 | 0.336 |
| マンガン (μg) † | 2.69 ± 0.72 | 2.47 ± 0.58 | 0.354 |
| βカロテン当量 (μg) † | 5096 ± 2213 | 3512 ± 1504 | 0.010 |
| レチノール当量 (μg) † | 629 ± 226 | 474 ± 179 | 0.015 |
| ビタミンD (μg) † | 10.2 ± 2.8 | 9.7 ± 3.2 | 0.366 |
| トコフェロール当量 (mg) † | 7.7 ± 2.4 | 6.7 ± 2.3 | 0.128 |
| ビタミンK (μg) † | 236 ± 97 | 200 ± 85 | 0.183 |
| ビタミンB ₁ (mg) † | 0.89 ± 0.29 | 0.76 ± 0.30 | 0.083 |
| ビタミンB ₂ (mg) † | 1.10 ± 0.38 | 0.93 ± 0.32 | 0.106 |
| ナイアシン (mg) † | 13.5 ± 6.0 | 12.0 ± 4.5 | 0.436 |
| ビタミンB ₆ (mg) † | 1.13 ± 0.37 | 0.96 ± 0.30 | 0.052 |
| ビタミンB ₁₂ (μg) † | 7.4 ± 4.0 | 7.2 ± 3.4 | 0.950 |
| 葉酸 (μg) † | 311 ± 104 | 260 ± 88 | 0.084 |
| パントテン酸 (mg) † | 5.40 ± 1.60 | 4.61 ± 1.19 | 0.074 |
| ビタミンC (mg) † | 122 ± 45 | 91 ± 36 | 0.013 |
| 飽和脂肪酸 (g) † | 17.23 ± 8.15 | 13.53 ± 5.71 | 0.120 |
| 一価不飽和脂肪酸 (g) † | 17.67 ± 7.48 | 15.65 ± 5.96 | 0.397 |
| 多価不飽和脂肪酸 (g) † | 11.42 ± 3.73 | 10.93 ± 4.25 | 0.372 |
| コレステロール (mg) † | 293 ± 127 | 297 ± 102 | 0.914 |
| 食物繊維総量 (g) † | 15.2 ± 4.6 | 13.1 ± 4.8 | 0.107 |

† T検定, ‡ Mann-WhitneyのU検定

有無, 十分な睡眠の有無, 1日3回の食生活習慣の有無, 喫煙習慣の有無, 飲酒習慣の有無など全10項目を調査した。記述統計量における性差の検定には, T検定, Mann-WhitneyのU検定を用いた。

3. 成績と結果

高齢者における生活習慣が栄養摂取状況に影響を与える因子となり得るかを調査するため, 関連要因と摂取栄養素との関連を比較した。

対象者の性別における, 年齢, 身長, 体重, BMI, 体脂肪率, 上腕周囲長, 上腕三頭筋皮下脂肪厚, 握力の結果, 年齢 [歳] (男性 74.0 ± 0.9, 女性 73.8 ± 0.8), 身長 [cm] (男性 165.1 ± 1.3, 女性 149.3 ± 0.7, p<0.01), 体重 [kg] (男性 60.5 ± 2.2, 女性 49.7 ± 1.1, p<0.01), BMI [kg/m²] (男性 22.7 ± 0.5, 女性 22.3 ± 0.5), 体脂肪率 [%] (男性 21.9 ± 1.0, 女性 31.1 ± 0.8, p<0.01), 上腕周囲長 [cm] (男性 26.7 ± 0.5, 女性 26.0 ± 0.4), 上腕三頭筋皮下脂肪厚 [mm] (男性 12.2 ± 1.3, 女性 18.5 ± 1.1, p<0.01), 握力右 [kg] (男性 32.5 ± 1.0, 女性 21.1 ± 0.6, p<0.01), 握力左 [kg]

図表2 飲酒習慣（飲酒習慣のある者）と栄養素の相関

| | 飲酒（あり）n=18 | 飲酒（なし）n=69 | p |
|----------------------------|--------------|--------------|-------|
| | mean (± SD) | mean (± SD) | |
| エネルギー (kcal) † | 1900 ± 494 | 1747 ± 457 | 0.396 |
| たんぱく質 (g) † | 71.3 ± 27.4 | 62.6 ± 18.6 | 0.354 |
| 脂質 (g) † | 53.3 ± 18.9 | 53.4 ± 21.0 | 0.908 |
| 炭水化物 (g) † | 254.1 ± 65.4 | 250.2 ± 56.5 | 0.892 |
| ナトリウム (mg) † | 4531 ± 1271 | 3837 ± 1243 | 0.039 |
| カリウム (mg) † | 2544 ± 733 | 2351 ± 786 | 0.444 |
| カルシウム (mg) † | 645 ± 281 | 630 ± 234 | 0.996 |
| マグネシウム (mg) † | 278 ± 86 | 246 ± 81 | 0.218 |
| リン (mg) † | 1113 ± 390 | 985 ± 299 | 0.330 |
| 鉄 (mg) † | 7.9 ± 2.6 | 7.7 ± 2.8 | 0.801 |
| 亜鉛 (mg) † | 8.2 ± 2.7 | 7.4 ± 2.0 | 0.460 |
| 銅 (mg) † | 1.15 ± 0.37 | 1.08 ± 0.31 | 0.611 |
| マンガン (μg) † | 2.84 ± 0.81 | 2.59 ± 0.66 | 0.264 |
| βカロテン当量 (μg) † | 5132 ± 1943 | 4739 ± 2234 | 0.497 |
| レチノール当量 (μg) † | 619 ± 204 | 597 ± 230 | 0.711 |
| ビタミンD (μg) † | 11.4 ± 2.7 | 9.7 ± 2.8 | 0.033 |
| トコフェロール当量 (mg) † | 8.1 ± 2.4 | 7.4 ± 2.4 | 0.262 |
| ビタミンK (μg) † | 253 ± 83 | 223 ± 97 | 0.232 |
| ビタミンB ₁ (mg) † | 0.87 ± 0.28 | 0.86 ± 0.30 | 0.987 |
| ビタミンB ₂ (mg) † | 1.13 ± 0.42 | 1.06 ± 0.36 | 0.454 |
| ナイアシン (mg) † | 16.3 ± 7.5 | 12.4 ± 5.0 | 0.013 |
| ビタミンB ₆ (mg) † | 1.29 ± 0.43 | 1.05 ± 0.32 | 0.037 |
| ビタミンB ₁₂ (μg) † | 10.0 ± 5.7 | 6.7 ± 2.9 | 0.015 |
| 葉酸 (μg) † | 323 ± 86 | 296 ± 106 | 0.313 |
| パントテン酸 (mg) † | 5.59 ± 1.73 | 5.17 ± 1.50 | 0.315 |
| ビタミンC (mg) † | 109 ± 27 | 119 ± 48 | 0.384 |
| 飽和脂肪酸 (g) † | 15.77 ± 6.82 | 16.78 ± 8.11 | 0.630 |
| 一価不飽和脂肪酸 (g) † | 17.73 ± 6.50 | 17.19 ± 7.42 | 0.679 |
| 多価不飽和脂肪酸 (g) † | 12.24 ± 4.00 | 11.06 ± 3.73 | 0.238 |
| コレステロール (mg) † | 319 ± 153 | 286 ± 112 | 0.318 |
| 食物繊維総量 (g) † | 14.7 ± 3.7 | 14.8 ± 4.9 | 0.928 |

† T検定, ‡ Mann-WhitneyのU検定

(男性 32.0 ± 1.0 , 女性 20.0 ± 0.6 , $p < 0.01$) であり, 身長, 体重, 体脂肪率, 上腕三頭筋皮下脂肪厚, 握力に有意な男女差がみられた. 体脂肪率, 上腕筋皮下脂肪厚については女性の方が有意に高値で, 身長, 体重, 握力については男性が有意に高値であった.

対象者における男女別の栄養素摂取についての結果, 高齢者の栄養素摂取において, 男女で有意な差はみられなかった.

居住形態と栄養素の関連の結果, 同居者ほど栄養素摂取が有意に高値を認めた項目は, 一価不飽和脂肪酸

($p = 0.051$) であった.

睡眠習慣と栄養素の関連の結果, 睡眠が十分である者ほど栄養素摂取が有意に高値を認めた項目は, βカロテン当量 ($p = 0.010$), ビタミンC ($p = 0.013$), レチノール当量 ($p = 0.015$), カリウム ($p = 0.043$) であった (表1).

1日3回の食生活習慣と栄養素の関連の結果, 1日3回規則正しい食生活習慣者ほど栄養素摂取が有意に高値を認めた項目は, ナトリウム ($p = 0.040$) であった.

飲酒習慣と栄養素の関連の結果, 飲酒習慣のある者ほど栄養素摂取が有意に高値を認めた項目は, ナイア

シン ($p=0.013$), ビタミン B₁₂ ($p=0.015$), ビタミン D ($p=0.033$), ビタミン B₆ ($p=0.037$), ナトリウム ($p=0.039$) であった (表 2)。

4. 考 察

高齢化が進む中で介護が必要な人が多くなりはじめの後期高齢者においては、特に栄養状態の低下が心配されている。高齢者の健康の維持・増進のためには早い時期からの栄養管理が重要であるとされている⁷⁾。

本研究において、高齢者の食事摂取状況は生活習慣の違いによる影響がみられた。独居者は一般に、孤独感、経済的困窮、栄養知識の欠如、気力の低下、買い物・調理能力の欠如などが問題となりやすいといわれているため低栄養に陥りやすいといわれている⁸⁾。居住形態と栄養素の関連の結果は、居住形態による食事摂取パターンの異なりが要因であると考えられる。

1日3回規則正しい食生活習慣者はナトリウムの摂取量が高いことが明らかになった。1日3回食事を摂ることにより食事量が増え、ナトリウムの摂取量が増えたと考えられる。ナトリウムの摂取量においては、加齢に伴う血圧上昇との間に有意な正相関が認められたとする報告がある。生活習慣病予防のためには減塩が推奨されるが、ナトリウムは味覚に強く関与し、高齢者では味覚が減退することと合わせて、極度の低ナトリウム食は食欲を損なわせる恐れを持つ。したがって低ナトリウム食が食欲や摂食能力が十分でない場合に起こり得る低栄養のリスクを増悪させる要因とならないよう、留意する必要があるといわれている⁹⁾。

睡眠不足や睡眠障害等の睡眠の問題は、疲労感をもたらす、情緒を不安定にし、適切な判断力を鈍らせるなど、QOLに大きく影響する。快適な睡眠を確保することは、いきいきとした健康な生活や事故の防止につながるものと考えられる¹⁰⁾。

飲酒により、アルコールとともに摂取する食事量の増加が考えられる。日本人においては「節度ある適度な飲酒」として、1日平均純アルコールで約20g程度であるとされており、65歳以上の高齢者においては、より少量の飲酒が適当であるといわれている¹¹⁾。

高齢者の食生活は、収入・経済的援助・家族の有無・

一人暮らしなど社会的・経済的要因によっても影響を受けると報告されている¹²⁾。また、食物摂取は人の日常的な基本行動であり、身体活動に必要な栄養素は通常食事を通じて補給されている。さらに、高齢社会において健やかな人生を送るための条件の一つとして食生活における満足度があげられる¹³⁾。

以上のことから、高齢者の住居環境・生活習慣は、食事摂取状況を左右し、栄養状態に影響を与えられられる。

謝辞

本研究を行うにあたり、ご協力いただきました愛知県日進市福祉部高齢福祉課のスタッフの皆様、ならびに、被験者の皆様に深謝致します。

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〈原 著〉

介護保険施設、病院(療養病床ならびに回復期リハビリテーション病棟) における摂食・嚥下障害を有する高齢者に関する 入・退所(院)時の情報連携の実態に関する研究

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要旨 摂食嚥下困難を有する高齢者に対する栄養ケアが、医療機関、介護保険施設ならびに在宅において継続的になされることは、高齢者のQOLの維持向上において極めて重要である。本研究では、全国における総数4,334の介護老人福祉施設、介護老人保健施設、医療療養病床、回復期リハビリテーション病棟における、摂食・嚥下障害を有する高齢者に関する入・退所(院)時の書面による他施設、他医療機関との情報連携に関する実態を調査した(回収率26.2%)。入・退所(院)時に、摂食・嚥下障害を有する高齢者に関する文書による連携がある施設は、特養、老健、療養病床の5~6割に過ぎず、回復期リハにおいては8割程度であり、この文書による連携に管理栄養士が関わっているのはその3~5割程度に過ぎなかった。また、情報連携のある状況でも、食事形態や食事内容、摂食・嚥下機能の状態は伝達されているものの、栄養アセスメント、モニタリング、栄養ケア計画の内容について情報提供を行っている施設は少なかったことから、管理栄養士による栄養ケア・マネジメント関連帳票を用いた情報提供が本人、家族の同意のもとに行われることが求められる。

キーワード：摂食・嚥下障害、情報共有、管理栄養士

1. 緒 言

摂食嚥下困難を有する高齢者の栄養ケアは、その身体・生活機能により個人への対応が異なるため、高齢者の個々に適した栄養ケアが継続的になされる必要がある。そのためには、摂食嚥下困難を有する高齢者に対して、医療機関、介護保険施設ならびに在宅を通してシームレスな栄養ケア・食事支援が可能でなければならない¹⁾。

2006年の診療報酬改定に伴い新設された栄養管理実施加算により、病院における栄養管理体制が構築されたことにより、栄養サポートチーム(Nutrition Support Team: NST)が多くの病院で稼働するようになった。さらに、2010年の診療報酬改定では、栄養サポートチーム加算(NST加算)が新設されたことにより、病院内におけるチームによる包括的な栄養ケアが推進されるようになった。しかし、2009年に実施された榎ら²⁾の、NST稼働施

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表1 摂食・嚥下障害を疑う高齢者がいる施設と人数

| | 特養 n=419 | | 老健 n=264 | | 療養病床 n=185 | | 回復期リハ n=204 | |
|-----|-------------|-------------|-------------|-------------|---------------|-------------|----------------|-------------|
| | n (%) | mean (SD) | n (%) | mean (SD) | n (%) | mean (SD) | n (%) | mean (SD) |
| いる | 399 (95.2) | 23.7 (17.0) | 252 (95.5) | 15.6 (13.9) | 166 (89.7) | 19.2 (24.7) | 186 (91.2) | 15.4 (15.9) |
| いない | 4 (1.0) | - | 6 (2.3) | - | 6 (3.2) | - | 9 (4.4) | - |
| 不明 | 16 (3.8) | - | 6 (2.3) | - | 13 (7.0) | - | 9 (4.4) | - |

※mean(SD)は100床当りの摂食・嚥下障害を疑う者の人数. n=有効回答施設

設における病院退院時の在宅への栄養ケアの継続性を調査した報告によると、地域一体型NSTを構築していた病院は、392病院のうち35病院と、わずか8.9%であった。葛谷ら²⁾は、病院において取り組まれた高齢者の摂食・嚥下障害に対する対応や栄養ケアは在宅に移行すると中断されてしまうと指摘しており、これは高齢者のQOLの維持、向上という観点からも極めて大きな課題と言える。しかしながら、現在、わが国の施設および病院における摂食・嚥下障害を有する高齢者に関する情報連携の実態状況を調査した報告は少ない。

そこで、本研究では、介護老人福祉施設(以下、特養)、介護老人保健施設(以下、老健)、医療療養病床(以下、療養病床)、回復期リハビリテーション病棟(以下、回復期リハ)における、摂食・嚥下障害を有する高齢者に関する入・退所ならびに入・退院時の書面による他施設、他医療機関との情報連携に関する実態を調査し、その課題を検討することとした。

II. 対象および方法

対象施設は全国の登録名簿から地域別床数別に3割を無作為抽出した特養1,517施設、老健941施設、療養病床1,134病院、全国回復期リハビリテーション協議会の登録名簿に登録された全回復期リハ742病院の合計4,334箇所であった。回答者は、介護保険施設では常勤管理栄養士、管理栄養士不在の場合は常勤看護師、回復期リハおよび療養病床では担当の常勤管理栄養士、管理栄養士が不在の場合は看護師長とした。

調査方法は、対象施設の施設(院)長、責任者宛てならびに回答者への調査協力依頼文書は、依頼状とIDを付し連結可能匿名化した調査票とともに郵送し、回答者の自由意思に基づいた調査票の返信をもって協力の承諾を得たとみなした。

主な調査内容は、①施設概要、②摂食・嚥下障害を疑う者(本調査では、経管栄養を一部併用の者も含む経口摂取者のうち、以下1~4のいずれかに該当する者と定義した。1)キザミ食およびミキサー食を摂取している者や、水分摂取の際にとろみ調整食品を使用している者、2)食

事摂取時に「むせ」などの兆候がみられる者、3)既往歴や現病歴に誤嚥性肺炎を有する者、4)摂食・嚥下障害の診断を有する者)の人数、③摂食・嚥下障害を有する高齢者に関する入・退所(院)時の文書による他施設との情報連携の有無、④情報提供先および情報提供元となる施設、⑤情報提供に関わる職種、⑥情報提供の内容、⑦前施設の管理栄養士から情報提供が必要と思われる内容、⑧管理栄養士から情報提供を行っている内容であった。調査票は、神奈川県立保健福祉大学内事務局において収集後、電子媒体にデータ入力し、SPSS 17.0を用いて基本集計を行った。なお、本調査は連結可能匿名化による自由意思に基づいた調査であり、神奈川県立保健福祉大学倫理審査委員会の承認を得て実施した。

III. 結果

1. 回収状況

施設別のアンケート回収数は、特養440(29.0%)、老健275(29.2%)、療養病床205(18.1%)、回復期リハ217(29.2%)、総回収数1,137(26.2%)であり、特養、老健、療養病床ともに、地域病床別に20~30%程度の回収率であり、地域病床別における大きな偏りはみられなかった。また、回答者は、全施設種において6割以上が「管理栄養士」であり、次いで「看護師」、「その他」であった。

2. 施設特性

対象施設における平均床数は、特養70.9(標準偏差[以下、SD]26.7)床、老健91.6(SD 25.4)床、療養病床81.6(SD 78.7)床、回復期リハ63.8(SD 37.0)床であった。また、100床当りの常勤管理栄養士数は、特養1.5(SD 0.9)名、老健1.2(SD 0.5)名、療養病床1.4(SD 2.9)名、回復期リハ1.2(SD 1.7)名であった。

3. 摂食・嚥下障害を疑う者がいる施設と人数

摂食・嚥下障害を疑う者が「いる」施設は特養95.2%、100床当り平均23.7(SD 17.0)名、老健95.5%、100床当り平均15.6(SD 13.7)名、療養病床89.7%、100床当り平均19.2(SD 24.7)名、回復期リハ91.2%、100床当り15.4(SD 15.9)名に及んでいた(表1)。

4. 摂食・嚥下障害を有する高齢者に関する入・退所(院)時の文書による情報連携の現状

1) 連携状況

摂食・嚥下障害を有する高齢者について他施設と文書による情報連携を行っていた施設は、特養54.8%、老健65.6%、療養病床60.9%、回復期リハ79.9%と、回復期リハでは約8割が文書による情報提供を行っていたが、特養、老健、ならびに療養病床では5~6割にすぎなかった(表2)。

2) 主な情報提供先および情報提供元

特養(n=234)および老健(n=177)からの情報提供先は、「一般病院」がそれぞれ73.1%と72.3%、「居宅介護支援事業所」がそれぞれ27.4%と49.2%、「特養」がそれぞれ22.6%と62.1%であった。一方、特養および老健への情報提供元は「一般病院」がそれぞれ82.1%と84.7%、「老健」がそれぞれ58.5%と61.6%、「居宅介護支援事業所」がそれぞれ47.4%と52.5%であった(表2)。

療養病床(n=120)および回復期リハ(n=167)からの情報提供先は、「老健」がそれぞれ84.2%と90.4%、「一般病院」がそれぞれ77.5%と71.9%、「特養」がそれぞれ72.5%と73.7%であった。一方、療養病床および回復期リハへの情報提供元は、「一般病院」がそれぞれ87.5%と89.8%、「老健」がそれぞれ67.5%と35.3%、「療養病床」がそれぞれ56.7%と29.9%であった(表2)。

3) 情報提供に関する職種

特養(n=234)および老健(n=177)からの情報提供に関する職種は、「看護師」がそれぞれ78.2%と78.5%、「介護支援専門員」がそれぞれ53.0%と63.3%、「管理栄養士」がそれぞれ51.3%と65.0%であった。一方、特養および老健への情報提供に関する職種は、「看護師」がそれぞれ77.8%と76.3%、「介護支援専門員」がそれぞれ59.0%と55.4%、「管理栄養士」がそれぞれ45.7%と37.3%であった(表2)。

療養病床(n=120)および回復期リハ(n=167)からの情報提供に関する職種は、「看護師」がそれぞれ93.3%と96.4%、「医師」がそれぞれ68.3%と71.3%、「言語聴覚士」がそれぞれ50.0%と94.6%であった。一方、療養病床および回復期リハへの情報提供に関する職種は、「看護師」がそれぞれ87.5%と85.6%、「医師」がそれぞれ68.3%と62.3%、「言語聴覚士」がそれぞれ43.3%と73.7%であった(表2)。

4) 情報提供内容

特養(n=234)および老健(n=177)からの情報提供内容は、「食事形態や食事内容」がそれぞれ89.7%と98.9%、「摂食・嚥下機能の状態」がそれぞれ75.2%と28.2%、「栄養アセスメントの内容」がそれぞれ16.2%と30.5%であった。一方、特養および老健への情報提供内容は、「食事形

態や食事内容」がそれぞれ97.4%と96.0%、「摂食・嚥下機能の状態」がそれぞれ86.8%と81.9%、「嚥下機能評価の結果」がそれぞれ19.2%と25.4%であった(表2)。

療養病床(n=120)および回復期リハ(n=167)からの情報提供内容は、「食事形態や食事内容」がそれぞれ99.2%と100.0%、「摂食・嚥下機能の状態」がそれぞれ91.7%と94.6%、「嚥下機能評価の結果」がそれぞれ47.5%と71.3%であった。一方、療養病床および回復期リハへの情報提供内容は、「食事形態や食事内容」がそれぞれ96.7%と92.8%、「摂食・嚥下機能の状態」がそれぞれ81.7%と80.2%、「嚥下機能評価の結果」がそれぞれ42.5%と54.5%であった(表2)。

5. 管理栄養士による摂食嚥下障害を有する高齢者に関する情報提供の現状

1) 管理栄養士による入・転所(院)時の情報提供の必要性
施設に入(転)院した嚥下障害のある高齢者について、前施設の管理栄養士からの情報提供を必要とする施設は特養92.4%、老健97.7%、療養病床97.9%、回復期リハ91.1%であり、すべての施設種において9割以上が管理栄養士からの情報提供を必要としていた(表3)。

2) 管理栄養士による入・転所(院)時の情報提供を必要とする内容

管理栄養士による情報提供を必要とする内容は、特養(n=232)および老健(n=250)では「食事形態」がそれぞれ97.8%と96.4%、「食事時の注意事項」がそれぞれ89.7%(n=208)と86.0%、「嗜好や禁忌」がそれぞれ88.8%(n=206)と85.6%(n=214)、「栄養状態」がそれぞれ85.8%(n=199)と80.0%(n=200)、「治療食の内容」がそれぞれ85.3%(n=198)と91.6%(n=229)、「栄養補給量」がそれぞれ78.4%(n=182)と81.6%(n=204)、「食事時の姿勢や体位」がそれぞれ74.6%(n=173)と65.2%(n=163)、「水分補給量」がそれぞれ70.7%(n=164)と60.0%(n=150)であった(表3)。

一方、療養病床(n=190)および回復期リハ(n=174)では、「食事形態」がそれぞれ95.3%と97.1%、「治療食の内容」がそれぞれ88.9%と88.5%、「栄養補給量」がそれぞれ79.5%と79.9%、「嗜好や禁忌」がそれぞれ79.5%と77.0%、「栄養状態」がそれぞれ74.2%と73.6%、「食事時の注意事項」がそれぞれ72.3%と64.9%、「食事や栄養に関する経過」がそれぞれ64.2%と64.4%、「水分補給量」がそれぞれ62.6%と60.3%であった(表3)。

3) 管理栄養士による退所(院)先への栄養・食事に関する情報提供の有無

特養(n=440)および老健(n=275)から管理栄養士による退所先への情報提供については、「施設の体制として通常している」がそれぞれ34.5%と53.1%、「退所(院)先から要望がある際にしてはいる」がそれぞれ16.8%と23.6%、

摂食・嚥下障害を有する高齢者に関する入・退所(院)時の情報連携

表2 介護保険施設・病院における摂食・嚥下障害を有する高齢者に関する入・退所(院)時の情報連携の実態(複数回答可).
n=有効回答施設

| | 特養 | 老健 | 療養病床 | 回復期リハ |
|----------------------|------------|------------|------------|-------------|
| | n (%) | n (%) | n (%) | n (%) |
| 他施設との情報連携を行っている | n=427 | n=270 | n=197 | n=209 |
| 施設(病院)からの情報提供先 | 234 (54.8) | 177 (65.6) | 120 (60.9) | 167 (79.9) |
| 一般病院 | 171 (73.1) | 128 (72.3) | 93 (77.5) | 120 (71.9) |
| 医療療養型病床 | 44 (18.8) | 72 (40.7) | 73 (60.8) | 128 (76.6) |
| 診療所 | 19 (8.1) | 29 (16.4) | 32 (26.7) | 56 (33.5) |
| 歯科診療所 | 32 (13.7) | 22 (12.4) | 12 (10.0) | 15 (9.0) |
| 介護老人福祉施設 | 53 (22.6) | 110 (62.1) | 87 (72.5) | 123 (73.7) |
| 介護老人保健施設 | 52 (22.2) | 117 (66.1) | 101 (84.2) | 151 (90.4) |
| 居宅介護支援事業所 | 64 (27.4) | 87 (49.2) | 63 (52.5) | 112 (67.1) |
| 地域包括支援センター | 28 (12.0) | 40 (22.6) | 42 (35.0) | 79 (47.3) |
| 訪問介護事業所 | 12 (5.1) | 28 (15.8) | 38 (31.7) | 5 (3.0) |
| 訪問看護ステーション | 13 (5.6) | 37 (20.9) | 55 (45.8) | 104 (62.3) |
| その他 | 2 (0.9) | 6 (3.4) | 2 (1.7) | 5 (3.0) |
| 施設(病院)への情報提供元 | 192 (82.1) | 150 (84.7) | 105 (87.5) | 150 (89.8) |
| 一般病院 | 76 (32.5) | 80 (45.2) | 68 (56.7) | 50 (29.9) |
| 医療療養型病床 | 23 (9.8) | 41 (23.2) | 41 (34.2) | 30 (18.0) |
| 診療所 | 27 (11.5) | 16 (9.0) | 9 (7.5) | 5 (3.0) |
| 歯科診療所 | 62 (26.5) | 68 (38.4) | 63 (52.5) | 45 (26.9) |
| 介護老人福祉施設 | 137 (58.5) | 109 (61.6) | 81 (67.5) | 59 (35.3) |
| 介護老人保健施設 | 111 (47.4) | 93 (52.5) | 39 (32.5) | 29 (17.4) |
| 居宅介護支援事業所 | 47 (20.1) | 49 (27.7) | 29 (24.2) | 17 (10.2) |
| 地域包括支援センター | 21 (9.0) | 28 (15.8) | 28 (23.3) | 20 (12.0) |
| 訪問介護事業所 | 19 (8.1) | 36 (20.3) | 44 (36.7) | 28 (16.8) |
| 訪問看護ステーション | 3 (1.3) | 2 (1.1) | 1 (0.8) | 0 (0.0) |
| 施設(病院)からの情報提供に関わる職種 | 120 (51.3) | 115 (65.0) | 49 (40.8) | 56 (33.5) |
| 管理栄養士 | 183 (78.2) | 139 (78.5) | 112 (93.3) | 161 (96.4) |
| 看護師 | 124 (53.0) | 112 (63.3) | 42 (35.0) | 37 (22.2) |
| 介護支援専門員 | 61 (26.1) | 112 (63.3) | 82 (68.3) | 119 (71.3) |
| 医師 | 14 (6.0) | 6 (3.4) | 6 (5.0) | 3 (1.8) |
| 歯科医師 | 6 (2.6) | 42 (23.7) | 60 (50.0) | 158 (94.6) |
| 言語聴覚士 | 108 (46.2) | 87 (49.2) | 22 (18.3) | 29 (17.4) |
| 介護職種 | 41 (17.5) | 22 (12.4) | 17 (14.2) | 20 (12.0) |
| 家族 | 20 (8.5) | 15 (8.5) | 10 (8.3) | 14 (8.4) |
| その他 | 107 (45.7) | 66 (37.3) | 32 (26.7) | 36 (21.6) |
| 管理栄養士 | 182 (77.8) | 135 (76.3) | 105 (87.5) | 143 (85.6) |
| 看護師 | 138 (59.0) | 98 (55.4) | 40 (33.3) | 31 (18.6) |
| 介護支援専門員 | 87 (37.2) | 108 (61.0) | 82 (68.3) | 104 (62.3) |
| 医師 | 18 (7.7) | 9 (5.1) | 5 (4.2) | 4 (2.4) |
| 歯科医師 | 19 (8.1) | 46 (26.0) | 52 (43.3) | 123 (73.7) |
| 言語聴覚士 | 76 (32.5) | 53 (29.9) | 17 (14.2) | 14 (8.4) |
| 介護職種 | 78 (33.3) | 41 (23.2) | 18 (15.0) | 15 (9.0) |
| 家族 | 14 (6.0) | 12 (6.8) | 8 (6.7) | 14 (8.4) |
| 情報提供先施設(病院)からの情報提供内容 | 210 (89.7) | 175 (98.9) | 119 (99.2) | 167 (100.0) |
| 食事形態や食事内容 | 176 (75.2) | 50 (28.2) | 110 (91.7) | 158 (94.6) |
| 摂食・嚥下機能の状態 | 21 (9.0) | 42 (23.7) | 57 (47.5) | 119 (71.3) |
| 嚥下機能評価の結果 | 38 (16.2) | 54 (30.5) | 34 (28.3) | 43 (25.7) |
| 栄養アセスメントの内容 | 35 (15.0) | 46 (26.0) | 22 (18.3) | 24 (14.4) |
| 栄養ケア計画書の内容 | 24 (10.3) | 34 (19.2) | 19 (15.8) | 23 (13.8) |
| モニタリングの内容 | 24 (10.3) | 40 (22.6) | 39 (32.5) | 77 (46.1) |
| 本人、家族への栄養指導内容 | 18 (7.7) | 39 (22.0) | 46 (38.3) | 97 (58.1) |
| 利用者が実施していた経口訓練法 | 4 (1.7) | 5 (2.8) | 4 (3.3) | 3 (1.8) |
| その他 | 228 (97.4) | 170 (96.0) | 116 (96.7) | 155 (92.8) |
| 食事形態や食事内容 | 203 (86.8) | 145 (81.9) | 98 (81.7) | 134 (80.2) |
| 摂食・嚥下機能の状態 | 45 (19.2) | 45 (25.4) | 51 (42.5) | 91 (54.5) |
| 嚥下機能評価の結果 | 42 (17.9) | 27 (15.3) | 19 (15.8) | 20 (12.0) |
| 栄養アセスメントの内容 | 42 (17.9) | 17 (9.6) | 18 (15.0) | 12 (7.2) |
| 栄養ケア計画書の内容 | 23 (9.8) | 20 (11.3) | 11 (9.2) | 9 (5.4) |
| モニタリングの内容 | 42 (17.9) | 25 (14.1) | 23 (19.2) | 24 (14.4) |
| 本人、家族への栄養指導内容 | 27 (11.5) | 40 (22.6) | 38 (31.7) | 68 (40.7) |
| 利用者が実施していた経口訓練法 | 7 (3.0) | 1 (0.6) | 3 (2.5) | 1 (0.6) |