虚弱予防，介入

虚弱予防とは，寝たきりになりやすい群を早期にスクリーニングすることが可能ならば，「ハイリスクグループ＝高危険集団」として特定し，早期に介入しようとする考え方である。

この考え方の原点は，生活習慣病におけるハイリスク集団の特定にある。前期高齢者の寝たきり原因の第一位である脳血管障害においては，高血圧，糖尿病などの疾患や，加齢，男性など避けえぬ要因と，日本酒に換算して2合以上の飲酒，喫煙などといったライフスタイルの要因が縦断研究によって明らかにされている。一方認知症では，代表的なアルツイハイマー認知症において，ApoE ε4 の遺伝的危険と高血圧が危険因子であることが明らかにされ，栄養学的にも，野菜不足，肉食過多などのライフスタイルの影響も注目を浴びている。しかしながら，健診レベルで調査指導を行う体制はまだ確立していない。

虚弱に対する最近の包括的アプローチ研究では，複数の生体システムに同時発生して虚弱を引き起こす障害に注目している。

多数の生理的組織が症候的，臨床的機能不全の限界に近づき，複数の系統において予備能力の限界を越えた結果生じる症状または症候群[15]という考え方で，極めて老年症候群に近い考え方である。実際の測定方法としては，運動系機能として，握力，up and go テスト，トレッドミル，6分間歩行などを行い，認知機能として MMSE（Mini-Mental State Examination），バランス機能として片脚立ち試験，栄養状態として BMI（body mass index），下腿周囲径などが挙げられている。これらは，「高齢者総合的機能評価ガイドライン」[14]に推奨した方法と図らずも一致している。同様の考え方に，虚弱は自立と終末期の中間点と見なす考

表1　虚弱指標

数々の虚弱検出方法が提唱されている。
なかでも，Rolfson の開発した，10項目を組み入れた「虚弱スケール（Frailty Scale）」では，テストにかかる時間は5分で，内容の有効性はずば抜けていると言われている。

調査項目		著者	年	文献
従属変数	独立変数			
虚弱	認知能力（時間見当識），移動能力，感情，栄養（体重減少）4種類以上の薬，入院歴，年齢（85歳以上） （1項目で危険）	Owens	1994	(16)
虚弱	16項目（身体機能4項目，栄養2項目，認知機能4項目，知覚機能6項目） （2分野で問題があれば虚弱）	Strawbridge	1998	(17)
入所危険	Frailty Scale4　高齢者の移動能力，セルフケア，排泄，認知能力	Rockwood	1999	(18)
介護危険度	Frailty Scale10　認知能力（Clock Drawing），病院の利用（昨年の入院回数），主観的健康感，手段的日常生活活動，社会的支援の利用可能度，薬の服用（5種類），栄養（体重の減少），抑うつ，失禁，up and go テスト	Rolfson	2000	(19)
易転倒者	Fall Risk Index　過去の転倒歴，歩行，筋力8項目，老年症候群8項目，環境因子5項目	鳥羽	2003	(20)

（文献21より改変）

MMSE：Mini-Mental State Examination（簡易認知機能検査），BMI：body mass index（ボディマス指数）

え方で，危険因子として，75歳以上の高齢，ADLおよびIADL (instrumental activity of daily living) 障害・依存状態，転倒・骨折，多剤投与，慢性病，認知機能低下，抑うつ，栄養障害を指摘している[15]。これも，老年症候群に対する総合的機能評価が虚弱の検出と介入に有効な指摘である。

虚弱の早期発見方法

数々の虚弱検出方法が提唱されている（表1）。

なかでも，Rolfsonの開発した，10項目を組み入れた「虚弱スケール (Frailty Scale)」では，このスケールの目的は，機能低下の危険があり，高齢者向けサービスへの関与から恩恵を受ける可能性がある高齢者を見つけることであるが，テストにかかる時間は5分で，内容の有効性はずば抜けていると言われている。

虚弱の表現型として，転倒が重要であることは国際的に一致している。われわれは簡易な21項目の「転倒スコア」を作成した（表2）[20]。

転倒スコアが増えるごとに転倒頻度は増加し，過去の転倒歴以外の21項目で10項目以上に該当すると，翌年の転倒予測に関し，感度，特異度とも70%以上の精度がある。地域住民で，Matsubayashiらは転倒スコアを調べ，年代別に低下

表2 転倒スコアと陽性頻度

転倒スコアが増えるごとに転倒頻度は増加し，過去の転倒歴以外の21項目で10項目以上に該当すると，翌年の転倒予測に関し，感度，特異度とも70%以上の精度がある。

#）転倒：解答数2,439名で708例 転倒例の平均転倒数：4.7±1.0回/年 (Mean±SE)	29.0%	
1）つまずくことがある	56.5.%	歩行機能 筋力 バランス
2）手摺につかまらずに，階段の上り下りをできない	50.6%	
3）歩く速度が遅くなってきた	65.2%	
4）横断歩道を青のうちにわたりきれない	17.0%	
5）1 kmくらい続けて歩けない	35.8%	
6）片足で5秒くらい立てない	38.6%	
7）杖を使っている	28.3%	
8）タオルを固く絞れない	16.8%	
9）めまい，ふらつきがある	32.4%	転倒関連 老年症候群
10）背中が丸くなってきた	44.9%	
11）膝が痛む	47.3%	
12）目が見えにくい	53.1%	
13）耳が聞こえにくい	42.5%	
14）物忘れが気になる	63.7%	
15）転ばないかと不安になる	45.8%	
16）毎日お薬を5種類以上飲んでいる	31.2%	
17）家の中で歩くとき暗く感じる	11.4%	環境要因
18）廊下，居間，玄関に障害物がある	20.8%	
19）家の中に段差がある	69.1%	
20）階段を使わなくてはならない	27.7%	
21）生活上，家の近くの急な坂道を歩く	33.3%	

（文献21より）

IADL：instrumental activity of daily living（手段的日常生活動作），QOL：quality of life（生活の質）

していくこと，ADL，うつや，QOL (quality of life) との相関が極めて良好で，虚弱の指標としての有用性を示している[12]。

また，最近多くの虚弱因子や転倒率と関連する足関節 Dorsiflex meter を開発したわれわれは，虚弱者に多い，歩行機能異常，転倒，もの忘れ，頻尿などについて，大脳の白質病変との関連を示した。

おわりに

骨に対するビスホスホネート，筋肉に対するビタミンDと並んで，動脈硬化疾患に対する治療法の中で，虚弱予防にも効果がある薬物療法や生活指導が今後の老年医学の大きな課題である。

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高齢者診療をめぐる現場の知識と実践の技

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大学で臓器の専門医として臨床で腕をふるい，教職も務め，「最近どの診療科も高齢者が増え，どの科も老人を診ているので，特に老年内科などという科はいらない」と認識し，公式にも発言していた方が，定年後，老人保健施設の医師になった．入所者から「先生，腰が痛く，トイレが近く，夜中に起きてしまうからなんとかしてください」と言われ，職員から「同じことを何度も聞くし，夕方には不穏になります，食事時にむせることも増えてきました」とも追加情報があった．「整形，泌尿器，精神科，耳鼻科など受診したのか？」と職員に聞くと，「退所しなくては受診できません」と言われ，困っていると，入所者に「先生，年寄りのこと何も知らないね」と容赦なくつぶやかれ，胸に堪えた．

このように老年医学の専門医であれば，1人でごく普通に日常診療で複数の老年症候群の診断と治療，生活指導までこなしていることが，専門診療科と異なる特色である．

本書は，前記のエピソードとまったく正反対の，医師人生後半を老人保健施設で過ごした「達人」による教科書である．高齢者医療の現場で従来の内科では解決がつかない症状に出会い，残念なことに老年医学のテキストも実践的記述が不十分なため，即戦力にならない．こんな時，外国文献に当たり，看護師の工夫を拾い，独自のアイデアを実践して，10年かけて積み上げたら立派な教科書ができていたということである．

高齢者医療は複数の疾患が合併し，症状も内科以外の各科にわたる複雑な分野であり，複雑性の克服は以前から課題であった．私も困難な上流からようやく一定の境地の中流に辿り着いたと思っていたが，多くの重要なことを見落としていたようだ．川岸に立つ賢人は，老人保健施設でゆっくり逍遥し，高齢者医療の「徒然草」をまとめあげている．専門家以外も一読に値する名著である．

Fall Prevention Using Olfactory Stimulation with Lavender Odor in Elderly Nursing Home Residents: A Randomized Controlled Trial

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OBJECTIVES: To investigate the effects of lavender olfactory stimulation intervention on fall incidence in elderly nursing home residents.

DESIGN: Randomized placebo-controlled trial.

SETTING: Three randomly selected nursing homes in northern Japan.

PARTICIPANTS: One hundred and forty-five nursing home residents aged 65 and older.

INTERVENTION: Participants were randomly assigned to the lavender (n = 73) or placebo group (n = 72) for a 360-day study period. The lavender group received continuous olfactory stimulation from a lavender patch. The placebo group received an unscented patch.

MEASUREMENT: The primary outcome measure was resident falls. Other measurements taken at baseline and 12 months included functional ability (assessed using the Barthel Index), cognitive function (Mini-Mental State Examination (MMSE)), and behavioral and psychological problems associated with dementia (Cohen-Mansfield Agitation Inventory (CMAI)).

RESULTS: There were fewer fallers in the lavender group (n = 26) than in the placebo group (n = 36) (hazard ratio (HR)=0.57, 95% confidence interval (CI) = 0.34-0.95) and a lower incidence rate in the lavender group (1.04 per person-year) than in the placebo group (1.40 per person-year) (incidence rate ratio = 0.51, 95% CI = 0.30-0.88). The lavender group also had a significant decrease in CMAI score ($P = .04$) from baseline to follow-up in a per protocol analysis.

CONCLUSION: Lavender olfactory stimulation may reduce falls and agitation in elderly nursing home residents; further research is necessary to confirm these findings. J Am Geriatr Soc 60:1005–1011, 2012.

Key words: fall prevention; lavender; nursing home residents

Falls are recognized as a major problem in community-dwelling elderly adults and even more so in frail elderly adults residing in institutions.[1,2] Approximately half of nursing home residents fall annually, two to three times that of community residents.[3] Falls are associated with morbidity and mortality in nursing home residents and linked to poorer overall functioning. A high risk of falling can considerably compromise the ability to perform activities of daily living (ADLs) and participate in social activities.[4] Reducing or minimizing the risk of falling can positively affect residents' quality of life.

Important underlying risk factors for falls include lower extremity weakness, gait and balance instability, poor vision, cognitive and functional impairment, and sedating and psychotropic medications.[1] Cognitive impairment is a strong risk factor for falls in nursing homes that may increase the risk of falls in multiple ways through the behavioral and psychological symptoms of dementia (BPSD), as well as gait and balance disturbances.[5–7]

A systematic review revealed that effective measures to prevent falls in nursing homes are seriously lacking.[7] Some challenges to incorporating fall prevention into practice include intervention feasibility, staff time constraints, competing demands, and inadequate reimbursement.[8,9]

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Other barriers include a perceived lack of skills by healthcare professionals in managing complex, multifactorial health conditions and a lack of coordination in the nursing home setting. To overcome these difficulties, a new innovative, easy-to-execute intervention is warranted.

It is hypothesized that lavender (*Lavandula angustifolia*), used in aromatherapy as a relaxant, has multiple ameliorating effects on fall-related risk factors in elderly adults. A previous study showed that olfactory stimulation using lavender oil improved balance in elderly people.[10] In addition, another recent study reported that gait performance as measured using the Timed Up and Go test and 10-m walking speed significantly improved after exposure to lavender olfactory stimulation.[11] Although these studies demonstrated a transient effect of lavender olfactory stimulation, long-term exposure to continuous lavender olfactory stimulation has not been investigated. It is conceivable that, if individuals were exposed continuously to lavender olfactory stimulation, the stabilizing effects of lavender odor on gait performance might prevent falls in frail elderly people.

Lavender odor has soothing properties affecting anxiety and agitation underlying BPSD.[12,13] BPSD, such as physically nonaggressive behaviors (including pacing and wandering) and aggressive behaviors (leading to increases in prescription neuroleptic medications), may lead to and increase in fall risk. Because of the difficulty in treating individuals with BPSD, prescription tranquilizers and other psychotropic medications are common,[14,15] but such medications have shown modest efficacy but can have adverse effects such as confusion, gait disturbance, and falls. Therefore, increasingly more attention is being paid to nonpharmacological interventions specific to agitation. A recent review identified aromatherapy with lavender as a potential treatment for BPSD in nursing home residents.[16]

Olfactory stimulation with lavender may prevent falls in nursing home residents by ameliorating behavioral and psychological problems and consequently reducing the need to prescribe psychotropic medications, thereby ameliorating gait and balance disorders. The aim of this study was to test the effects of continuous lavender olfactory stimulation on the incidence and risk of falls in elderly nursing home residents. To this end, a randomized placebo-controlled trial was conducted using a paper patch with or without lavender attached daily by care staff to the inside of the clothes near the neck of nursing homes residents.

METHODS

Study Design, Participants, and Setting

The trial was conducted in three nursing homes randomly selected from 24 nursing homes in Aomori city, northern Japan. Inclusion criteria for eligible subjects were aged 65 and older and the ability to transfer independently regardless of assistive devices used. Recruitment occurred between September 10, 2009, and January 27, 2010. Of the 155 residents meeting the eligibility criteria, 10 were excluded; three did not provide informed consent, three moved before the trial began, and four had pica disorder. Residents with pica disorder, the unusual desire to eat "unnatural" things for food, were excluded because of the risk that they would eat the patch.

In each nursing home, the eligible residents were randomized to the lavender group or placebo group at a 1:1 ratio. An independent statistician performed resident allocations using computer-generated randomization of numbers at each nursing home. Treatment allocation status was delivered to the head nurse at each nursing home, and patches were prepared accordingly. Participants and study staff were blinded to the treatment groups and outcome measurements. One hundred and forty-five residents were randomized: 73 to the lavender group and 72 to the placebo group.

The ethics board of Tohoku University Graduate School of Medicine approved the study protocol, and the study design took into account the principles set out in the Helsinki Declaration (Seoul, 2008). The protocol was registered to UMIN Clinical Trials Registry identifier (UMIN000004222).

Intervention

Lavender olfactory stimulation was provided using a commercially available white patch (1 cm × 2 cm, Aromaseal Lavender; Hakujuji Co., Tokyo, Japan). This patch, attached to the inside of the resident's clothes near the neck, was originally developed to make busy and stressful people relax by providing continuous olfactory exposure to lavender for 24 hours. The odor is so faint that only the person wearing the patch can sense it. The price of one patch is 25 cents U.S. The placebo patch was an Aromaseal that had not been processed and was unscented. Nursing home staff, blinded to which Aromaseal was the placebo, affixed the lavender or placebo patch to the resident's clothing and replaced the patch daily. The head nurse prepared the appropriate patches and distributed them to the nursing home staff accordingly. Residents wore the patch for the whole day. At the time the patch was changed, the nursing home staff confirmed the existence of the prior day's patch; if the patch was missing, it was reported. The intervention finished 360 days after the start unless a resident dropped out. The final participants finished follow-up on January 14, 2011.

Measurements

The primary outcome measure was resident falls. For this study, a fall was defined in accordance with the World Health Organization's definition: "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level."[17,18] The nursing home staff, blinded to group allocation, were trained to identify falls according to this definition and recorded falls daily using fall calendar sheets. The head nurse supervised the recording of falls regularly, and the calendar sheets were audited monthly to ensure agreement with incident reports. Individual nursing notes were also cross-checked for duplication and missed falls.

Trained research assistants, blinded to group allocation and information from previous evaluations, collected demographic and behavioral measures at baseline and 12-month follow-up. Behavioral measurements included the Cohen-Mansfield Agitation Inventory (CMAI) to quantify

BPSD,[19] the Barthel Index to assess level of functional ability, the MMSE to assess cognitive function, and the Vitality Index to assess activity of daily living (ADL)-related vitality.[20] The resident and caregiver assessed fall history in the previous year, and the staff was consulted and nursing notes and resident charts reviewed. To predict the probability of falling, visual, transfer, and mobility status were assessed using the St. Thomas's Risk Assessment Tool in Falling Elderly Inpatients (STRATIFY).[21] Medication status was assessed from medical chart reviews.

Statistics

Initial comparisons of outcome measures between groups were performed using chi-square tests or Mann-Whitney tests, as appropriate. Kaplan–Meier plots were used to compare time to first fall between groups.

Analyses for main outcomes, including time to first fall and number of falls per person-year, were based on an intention-to-treat analysis. Kaplan–Meier analyses and log-rank statistics were used to compare the proportion of fallers to non-fallers over time between groups. For consideration of covariance in time to first fall analysis between groups, a multivariate Cox proportional hazards regression was performed. A comparison of the number of falls per person-year between groups was performed using a multivariate Poisson regression model regarding the observation time as the offset variable. To confirm robustness in the Poisson regression model, the standard errors of each coefficient were adjusted by multiplying the unadjusted standard errors by the square root of the multiplicative overdispersion factor.

In multivariate analyses, age category (65–74 vs ≥ 75), sex, history of fall in a previous year (presence vs absence), cognitive function (MMSE score < 24 vs ≥ 24), agitation status (CMAI 22 = not agitated vs ≥ 23 = shows signs of agitation), transfer status (STRATIFY transfer and mobility score 0, 1, 2, 5, 6, or 3, 4), visual status (STRATIFY 1 or 2), number of medications (<5 vs ≥ 5), and use of tranquilizers (yes vs no) were regarded as possible covariates for the Model 1 multivariate analysis. In the Model 2 analysis, variables that achieved a significance level of $P < .2$ in the univariate analysis were subsequently included in a multivariate analysis using the stepwise forward Cox regression procedure and the Poisson regression procedure, respectively. To elucidate the mechanisms underlying the effects of lavender olfactory stimulation, an analysis for secondary outcomes, such as changes in CMAI, Barthel Index, MMSE, and Vitality Index were performed using a per protocol analysis. Normality of the data was assessed using the Shapiro-Wilk test. Comparisons between groups were performed using the Mann-Whitney test. Comparisons within groups at different time points were performed using the Wilcoxon signed-rank test or the paired Student *t*-test.

The analysis of outcomes for fallers and falls (Table 2) was done on the intention-to-treat analysis set, whereas the comparison of treatment groups at baseline and follow-up (Table 3) used the per protocol analysis set. All *P*-values were two-sided to detect a significance level of $P < .05$. Analyses were performed using SAS software version 9.2 (SAS Institute. Inc., Cary, NC).

Sample Size

To calculate the required sample size, the number of falls per person-year was focused on, based on data from similar nursing homes in Japan.[22] When the sample size in each group is 69, with a total number of events required (E) of 55, an exponential maximum likelihood test of equality of survival curves with a .05, two-sided significance level will have an 80% power to detect the difference between a placebo exponential parameter (l_1) of 0.8500 and an active exponential parameter (l_2) of 0.4000 (constant hazard ratio (HR) = 2.125); this assumes an accrual period of 0.10, a maximum follow-up time of 1.00, and no dropouts.[23]

RESULTS

A flowchart of enrollment, randomization, and follow-up is shown in Figure 1. No significant differences were observed between the lavender and placebo groups in the proportion who withdrew or in their reasons for withdrawal. No participants refused the lavender-scented patch, and there were no adverse effects reported due to exposure to the lavender. The baseline and demographic characteristics of residents allocated to each group are summarized in Table 1. The groups did not differ significantly according to age or risk factors for falls. No participants had missing values on primary outcome measures before death or discharge from nursing homes.

There were 62 falls reported during the follow-up period (Table 2); only two resulted in injury, a subdural hemorrhage in the lavender group and a femoral neck fracture in the placebo group. The percentages of participants who

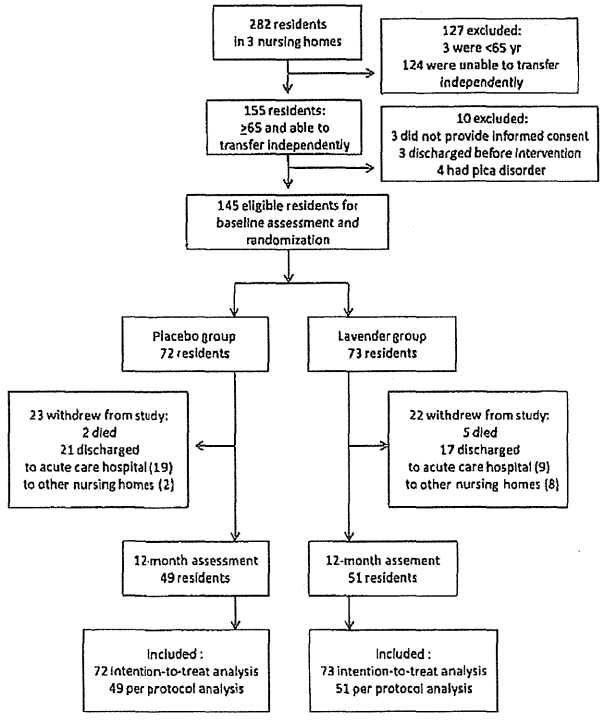

Figure 1. Flowchart for enrollment, randomization, and follow-up of study participants.

Table 1. Baseline Characteristics of Participants (n = 145)

Characteristic	Placebo, n = 72	Lavender, n = 73	P-Value
Age, mean ± SD	84.1 ± 7.7	84.2 ± 7.8	.93[a]
≥75 years, n (%)	62 (86.1)	64 (87.7)	.81[b]
Female, n (%)	13 (18.1)	14 (19.2)	>.99[b]
Comorbidity, n (%)			
History of stroke	23 (31.9)	24 (32.9)	>.99[b]
Diabetes mellitus	12 (16.7)	18 (24.7)	.31[b]
Osteoarthritis	1 (1.4)	1 (1.4)	>.99[c]
Parkinson's disease	1 (1.4)	1 (1.4)	>.99[c]
Visual impairment	6 (8.3)	10 (13.7)	.42[b]
Barthel Index, mean ± SD	49.6 ± 19.2	50.3 ± 18.5	.82[a]
Mini-Mental State Examination score, mean ± SD	14.6 ± 8.1	15.3 ± 8.4	.61[a]
<24, n (%)	59 (81.9)	60 (82.2)	>.99[b]
Cohen-Mansfield Agitation Inventory score, mean ± SD	24.6 ± 6.9	24.2 ± 5.2	.61[a]
≥23, n (%)	18 (25.0)	23 (31.5)	.46[b]
Vitality Index, mean ± SD	8.1 ± 1.9	8.1 ± 2.0	.73[a]
History of falls, n (%)	30 (41.7)	31 (42.5)	>.99[b]
History of recurrent falls, n (%)	11 (15.3)	10 (13.7)	.49[b]
Transfer risk, n (%)	34 (47.2)	41 (56.1)	.32[b]
Mobility status[d], n (%)			
Walk without aids	52 (72.2)	53 (72.6)	.88[b]
Walk with aids	16 (22.2)	17 (23.3)	
Use a wheelchair	4 (5.6)	3 (4.1)	
Number of medications, mean ± SD	4.9 (2.7)	5.0 (2.3)	.85[a]
≥5, n (%)	37 (51.4)	37 (9.6)	>.99[b]
Prescription medications, n (%)			
Tranquilizer	15 (20.8)	10 (13.7)	.28[b]
Antidepressant	1 (1.4)	2 (2.7)	>.99[c]
Yokukansan	6 (8.3)	5 (6.8)	.77[b]
Diuretics	11 (15.3)	15 (20.5)	.52[b]
Antihypertensive	43 (59.7)	45 (61.6)	.87[b]
Antidiabetic drugs	7 (9.7)	11 (15.1)	.45[b]

SD, standard deviation.
[a] Mann–Whitney *U*-test.
[b] Chi-square test.
[c] Fisher exact test.
[d] Moving to the bathroom.

fell at least once during the 12-month study period were 35.6% (lavender group) and 50% (placebo). There were no significant differences observed when examining Kaplan Meier plots of time to first fall between treatment groups ($P = .11$) or in relation to tranquilizer use ($P = .16$).

The crude results of the Cox proportional hazards analysis on the intention-to-treat analysis set were not significant (Table 2), although after adjustment for covariates between the lavender and placebo groups, the differences for first fall were significant for Models 1 ($P = .04$) and 2 ($P = .03$). The HR of the intervention to placebo group was 0.59 (95% confidence interval (CI) = 0.35–0.99) after adjustment for age, sex, fall history, MMSE, CMAI, transfer and visual status, and tranquilizer use (Model 1). The HR decreased to 0.57 (95% CI = 0.34–0.95) after adjustment for MMSE, fall history, and transfer (Model 2).

Table 2. Outcomes for Fallers and Falls

Outcome	Placebo, n = 72	Lavender, n = 73	P-Value
Intervention days, mean ± standard deviation	313.8 ± 76.3	287.6 ± 114.5	.76[a]
Faller, yes/no	36/36	26/47	.08[b]
Recurrent faller, yes/no	23/49	14/59	.08[b]
Total number of falls, n	88	46	
Fall rate per person-year	1.40	1.04	
Hazard ratio for fallers (95% CI)			
Crude	1	0.67 (0.40–1.10)	.11[c]
Adjusted (Model 1)	1	0.59 (0.35–0.99)	.04[c]
Adjusted (Model 2)	1	0.57 (0.34–0.95)	.03[c]
Incidence rate ratio for fallers (95% CI)			
Crude	1	0.57 (0.32–0.99)	.04[d]
Adjusted (Model 1)	1	0.54 (0.31–0.95)	.03[d]
Adjusted (Model 2)	1	0.51 (0.30–0.88)	.02[d]

CI, confidence interval.
Model 1 adjusted for age, sex, fall history, Mini-Mental State Examination (MMSE) score, Cohen-Mansfield Agitation Inventory, transfer status, visual status, tranquilizer. Model 2 adjusted for MMSE score, fall history, transfer (selected using stepwise variable selection).
[a] Mann–Whitney *U*-test.
[b] Chi-square test.
[c] Cox proportional hazard regression.
[d] Poisson regression model.

The number of falls per person during the follow-up period ranged from zero to five in the lavender group and zero to seven in the placebo group. As shown in Table 2, the incidence rate for the lavender group was significantly lower than for the placebo group even before adjustment for possible covariates ($P = .04$). The incidence rate ratio (IRR) in crude analysis was 0.57 (95% CI = 0.32–0.99). After adjustment for age, sex, fall history, MMSE, CMAI, transfer and visual status, and tranquilizer use (Model 1), the IRR decreased to 0.54 (95% CI = 0.31–0.95). After adjustment for MMSE, fall history, and transfer status (Model 2), the IRR further decreased to 0.51 (95% CI = 0.30–0.88).

Table 3 shows the results of per protocol analyses for changes in functional ability (Barthel Index), cognitive function (MMSE), volition (Vitality Index), and agitation (CMAI) after 12 months of treatment. No differences were observed between groups at baseline or 12 months for any of the indexes analyzed. The lavender and placebo groups showed a significant decrease in cognitive functioning at 12-month follow-up. When comparing CMAI scores at 12-month follow-up, the lavender group showed a significant decrease in agitated status ($P = .04$) from baseline, but the placebo group did not. The Barthel and Vitality indexes did not change significantly from follow-up in either group. The average number of medications at 12-month follow-up was 4.73 ± 2.17 in the lavender group and 4.57 ± 2.17 in the placebo group.

During the study period, one resident from each group was newly prescribed tranquilizers. At 12-month follow-up, six residents in the lavender group and 10 in the placebo group were prescribed tranquilizers. No significant difference was observed in the number of residents

Table 3. Comparison of Groups at Baseline Versus Follow-Up in Per Protocol Analyses

Test	Placebo (n = 49)			Lavender (n = 51)		
	Baseline	Follow-Up		Baseline	Follow-Up	
	Mean ± SD		*P*-Value	Mean ± SD		*P*-Value
Barthel Index	50.0 ± 1.91	47.5 ± 21.0	.09[a]	49.6 ± 18.3	49.5 ± 18.5	.94[b]
Mini-Mental State Examination score	14.6 ± 21.0	11.9 ± 8.4	<.001[a]	15.3 ± 9.2	13.4 ± 9.1	<.001[a]
Cohen-Mansfield Agitation Inventory score	24.5 ± 6.7	24.0 ± 3.7	.82[a]	24.3 ± 5.4	22.9 ± 2.3	.04[a]
Vitality Index	8.2 ± 1.7	8.1 ± 2.3	.76[a]	8.2 ± 2.0	8.1 ± 2.2	.90[a]

SD, standard deviation.

No difference was observed between groups at baseline and after 12-month interventions for each index according to the Mann–Whitney *U*-test.

P-value was comparison between baseline and post intervention according to [a]Wilcoxon rank test or [b]paired Student t-test.

prescribed tranquilizers between the groups at baseline ($P = .78$) or the end of the trial ($P = .71$). One resident from the lavender group and one from the placebo group took vitamin D (1 μg) daily; neither of them fell during the study period.

DISCUSSION

This study highlights the beneficial effects of lavender odor on fall prevention in elderly nursing home residents. This multifacility randomized placebo-controlled study showed that daily use of a lavender patch was associated with a lower incidence rate of falls. Although not significant, the number of residents who fell during the observation period ($P = .08$) and those who fell two or more times during the 12-month study ($P = .11$) was less in the lavender group. After adjustment for possible confounding factors, the proportion of residents who were nonfallers over time was significantly lower in the lavender group.

The mechanism by which lavender prevents falls is speculative. Lavender oil is used extensively in aromatherapy and is described as therapeutic for insomnia, headaches, migraines, anxiety, nervousness, and melancholy.[24] Lavender has been used as a sleep aid and can be a useful nonpharmacological alternative to traditionally prescribed medications for insomnia, which are strong risk factors for falls in elderly adults.[25] Because lavender is thought to have soothing properties, it is logical to assume it may also affect the anxiety and agitation that underlie BPSD. The lavender group showed a significant decrease in agitated status, whereas the placebo group did not, suggesting the involvement of a soothing effect of lavender odor. There was not significant less tranquilizer use in the lavender group than in the placebo group, so tranquilizer use was not viewed as a potential confounding factor in the present study. The frequency of tranquilizer use was lower in the current study than in other studies in nursing homes, probably because of Yokukansan use, a traditional Asian medicine commonly prescribed to treat BPSD.[26,27] Although there was no difference in Yokukansan use between the lavender and placebo groups, further study is warranted to elucidate the relationship between Yokukansan, tranquilizers, and lavender olfactory stimulation.

Another possible explanation for why lavender prevents falls might be attributed to its stabilizing effects on balance. In previous work, the application of olfactory stimulation by an essential oil such as lavender and black pepper during quiet standing was associated with less postural sway in frail elderly adults.[10] Multiple sensory and motor mechanisms ranging from peripheral to cortical sensory-motor integration regulate the control of posture and motion.[28] In addition to vestibular afferents, visual and proprioceptive inputs contribute to postural stability. Although several multisensory vestibular cortical areas, which process signals provided from multiple thalamic nuclei, were identified using imaging studies, the core vestibular cortical region is thought to be located in the insular cortex.[29] Odor is one of the strongest stimuli over a wide area of the cerebral cortex including the insular cortex.[30] Olfactory stimulation may stabilize balance by activation of the insular cortex. Unfortunately, a limitation of the present study is the lack of balance data. Further studies are needed to clarify the contribution of the balance-stabilizing effects of lavender on fall prevention.

Only two residents were prescribed vitamin D (1 in each group). Vitamin D supplementation is an easy pharmacotherapy to prevent falls in nursing home residents.[1,7] The current evidence recommends that vitamin D be prescribed in a dosage of 1,000 IU for nursing home residents. Vitamin D may be effective in reducing falls and increasing muscle strength in persons with severe vitamin D deficits,[1] but current evidence of risk reduction of falls with vitamin D supplementation is inconsistent.[7]

Several current guidelines recommend multifactorial risk assessment of falls and interventions customized to an individual's risk factor profile as a primary treatment strategy in community-dwelling elderly people.[1,31] Several randomized controlled trials have investigated the effectiveness of this strategy in nursing home residents,[32–39] and only some of the trials showed efficacy in reducing falls.[36–39] It is unclear whether differences in effectiveness may be attributed to a variation in the type of intervention or selection bias. The sample population recruited into trials may not be representative of the general elderly population (e.g., lack of studies that include participants with multiple comorbidities or cognitive decline). It is important to develop a suitable program for multifactorial intervention in each facility setting.

The present study has several limitations. First, it was conducted with nursing home residents, so results cannot be generalized to community-dwelling elderly people. Second, although the study showed that lavender olfactory

stimulation prevents falls in elderly nursing home residents, it was not powered to detect a clinically relevant reduction in injurious falls because the incidence of such events was low. Third, as is the nature of odor application, nursing home residents and staff may not have been completely blinded, which may have resulted in reporting bias. Finally, the olfactory functioning of the participants was not tested. Difficulty in identifying odor has been reported not only in individuals with Alzheimer's and Parkinson's diseases,[40] but also in elderly persons without cognitive impairment.[41] Therefore, it was possible there were residents who could not sense the lavender odor.

A meta-analysis showed that a multifactorial intervention including exercise training for balance stability reduced the risk and rate of falls in community-dwelling elderly adults.[25] Moreover, gradual withdrawal of some types of drugs for improving sleep, reducing anxiety, and treating depression have been shown to reduce the rate of falls.[25] Lavender olfactory stimulation acts on balance and psychological status, suggesting that it may have the ability to reduce falls in nursing home residents and community dwelling-elderly adults.

CONCLUSION

Daily olfactory stimulation with lavender may prevent falls in elderly nursing home residents. Further studies with large sample sizes comprising multiple ethnic groups are warranted to confirm these findings.

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Author's Contributions: All authors were involved in the conception and design of this study. YS, SE, and TE: recruited the study population and conducted the clinical trial. SE: conceived the original idea for the study, supervised in the conception and design of the study, and drafted the manuscript. NT: advised on biostatistical methodology and provided critical revisions to the manuscript. KT, SF, HA, and MK: assisted with analysis of the data and critically reviewed the manuscript. All authors read and approved the final manuscript.

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RELATIONSHIP BETWEEN TESTOSTERONE AND COGNITIVE FUNCTION IN ELDERLY MEN WITH DEMENTIA

To the Editor: A decrease in sex hormones with aging has been reported to be related to psychosomatic disorders such as late-onset hypogonadism syndrome, frailty, and cognitive impairment in adult men.[1] For example, a community-based cross-sectional study has shown that elderly men with a lower blood concentration of bioavailable testosterone have more-severe impairment of cognitive function.[2] Moreover, a longitudinal study indicated that serum free testosterone (FT) concentration could predict memory performance and cognitive status in elderly men,[3] but it is unknown whether lower testosterone concentration is related to cognitive impairment in individuals with dementia, because the previous studies primarily focused on a healthy community-based population. Also, few studies have addressed the relationship between testosterone and cognitive function in elderly Japanese men.

One recent cross-sectional study showed that total testosterone and FT concentration were associated with activities of daily living (ADLs) in institutionalized elderly men.[4] This study also revealed that a relationship between testosterone and cognitive function could be found even in institutionalized elderly men with physical or neuropsychiatric dysfunction. Thus, whether lower testosterone concentration is related to deterioration of ADL in elderly men with cognitive impairment was longitudinally investigated.

Fifty-two male outpatients attending the Center for Comprehensive Care on Memory Disorders at Kyorin University Hospital were recruited (mean age 77.0 ± 5.5, range 65–87). Participants' clinical backgrounds were hypertension, 48.9%; diabetes mellitus, 12.2%; and dyslipidemia, 38.1%. None had a history of stroke. Comprehensive geriatric assessment was performed based on basic ADLs (Barthel Index),[5] instrumental ADLs (Lawton and Brody IADLs, 0 5 points in men),[6] cognitive function (Mini-Mental State Examination (MMSE)),[7] mood (Geriatric Depression Scale (GDS), 15 items),[8] and vitality (Vitality Index, 10-point scale).[9] This assessment was repeated 1, 2, and 3 years after baseline assessment at the first visit to the clinic. At the first visit, blood was drawn after an overnight fast and FT concentration was measured using radioimmunoassay. FT values ranged from 1.0 to 53.0 pmol/L (mean ± SD 30.4 ± 11.0 pmol/L). Participants were classified into three groups according to tertile according to the baseline FT value (Figure 1), and the parameters from the comprehensive geriatric assessment were compared between groups and visits. Statistical data were analyzed using SPSS version 17.0 (SPSS, Inc., Chicago, IL). One-way analysis of variance (ANOVA) was applied for comparisons between groups, and the Fisher post hoc test was applied when significant ($P < .05$). One-way repeated ANOVA was used for comparisons between baseline and the 1-, 2-, and 3-year visits, and the Fisher post hoc test was applied when significant ($P < .05$).

There were no significant differences between groups in age (high, 75.3; middle, 76.6; low, 79.0), basic ADLs (high, 96.9; middle, 99.1; low, 95.3 points), MMSE (high, 23.2; middle, 25.1; low, 23.1 points), GDS-15 (high, 5.1; middle, 4.1; low, 4.6 points), and Vitality Index (high, 9.1; middle, 9.1; low, 8.8 points) at baseline, whereas IADLs tended to be lower (high, 4.1; middle, 4.1; low, 3.4 points, $P = .06$) in the low FT tertile group than in the other groups.

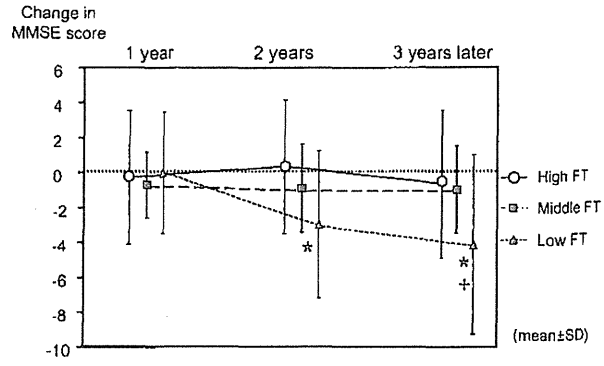

Figure 1. Change in Mini-Mental State Examination (MMSE) score according to tertile of serum free testosterone (FT) level in men. FT tertile: high, >36.1 pmol/L, n = 17; middle, 29.1 35.4 pmol/L, n = 17; low, <28.8 pmol/L, n = 18. *$P < 0.05$ vs highest FT group, +$P < 0.05$ vs middle FT group.

At the 1-year visit, there was no difference in change in MMSE score from baseline between the groups, although the decrease in MMSE score was larger in the low FT tertile group than in the middle and high tertile groups at the 2- and 3-year visits (Figure 1). Also, MMSE scores were lower in the low FT tertile group at the 2- ($P = .009$) and 3-year ($P < 0.001$) visits than at baseline, whereas they were not lower in the middle and high tertile groups. In contrast, there was no such trend in basic ADLs, IADLs, GDS scores, and Vitality Index.

Multiple regression analysis was performed with a decrease in MMSE score as a dependent variable and age; ADLs; body mass index; presence of hypertension, diabetes mellitus, or hyperlipidemia; and FT concentration as independent variables to consider factors affecting cognitive impairment, according to a previous report.[4] Blood FT concentration was found to be an independent predictor of decrease in MMSE score at the 3-year visit ($\beta = 0.492$, $P = .02$).

A number of investigations support the biological plausibility of a protective effect of testosterone against cognitive dysfunction. The present findings from memory clinic outpatients are consistent with previous findings observed in elderly community-based men, showing a relationship between FT concentration and cognitive performance.[3] Furthermore, the present findings indicate that a lower FT concentration could lead to a faster decline in cognitive function in elderly Japanese men who already show cognitive impairment. This study provides fundamental data for the future study of hormone replacement therapy for cognitive decline in elderly adults with low FT.

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BASELINE INSTRUMENTAL ACTIVITIES OF DAILY LIVING AND INCIDENT DEMENTIA

To the Editor: Sikkes et al.[1] have written an important paper showing that individuals without dementia with impairment in at least one of nine instrumental activities of daily living (IADLs) at baseline had a significantly higher incidence of dementia at 12 months (24.4%) than individuals without IADL impairment at baseline (16.7%) ($P = .04$). Their 531 participants who were followed for 12 months were relatively young (mean age 69.6), so it was decided to duplicate their study from prospective data from the Wyong Hospital Memory Clinic, 100 km north of Sydney. From 415 individuals attending a memory clinic, community-dwelling individuals aged 60 and older who were free of dementia at baseline and had a Mini-Mental State Examination score (MMSE[2]) of 25 to 30 and a follow-up MMSE and Montreal Cognitive Assessment (MoCA), range 0 (worst) to 30 (best)[3] at 12 months were selected in a consensus conference of a geriatrician (PJ) and a clinical nurse consultant (EH). Each individual's family rated IADLs on the Nottingham scale,[4] which ranged from 0 (worst) to 22 (best). Twenty-two of 82 (27%) converted to dementia at 12 months, compared with Sikkes conversion rate of 20.8% at 24 months—the most likely reason for this difference was that mean age (79.1) was 9.5 years older than theirs (69.6). Stats Direct Version 2.7.8b (StatsDirect Ltd, Altrincham, UK) from November 2011 was used to compare converters and nonconverters. Mean age of the 22 converters at baseline was significantly higher that that of the 60 nonconverters (82.0 ± 5.8 vs 78.0 ± 6.8, $P < .01$), mean IADL score at baseline was significantly lower (13.1 ± 5.3 vs 16.1 ± 4.0, $P = .0236$), MMSE score at baseline was by definition lower (25.6 ± 0.73 vs 27.5 ± 1.50, $P < .001$), and MoCA score at baseline was lower (19.2 ± 3.5 vs 22.8 ± 3.9, $P < .001$). At 12 months, IADL (11.4 ± 5.6 vs 15.4 ± 4.5, $P = .004$), MMSE score (21.6 ± 4.5 vs 27.4 ± 1.6, $P < .001$), MoCA (16.8 ± 3.6 vs 22.8 ± 4.2, $P < .001$) remained significantly lower in converters.

The Nottingham IADL covers seven of the nine IADL items that Sikkes used, excluding medications and finances. Women are more likely than men to perform five of the Nottingham IADL items unless the men live alone with no home care services: cleaning the kitchen, making a hot snack, washing small items of clothing, doing a full clothes wash, and doing housework.

Although the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, criteria for dementia include a decline in social and occupational function, there is a surprising lack of research into IADLs as a predictor of incident dementia. This is an important topic for future research and ongoing studies are being conducted in three cohorts: Wyong Memory Clinic; general medical inpatients with delirium or subsyndromal delirium—a prospective randomized controlled trial, Central Coast Australia Delirium Intervention Study; and PhD study, PR DEFEAT DELIRIUM, in outpatients at high risk for incident delirium. One study[5] with 255 community-dwelling individuals attending a memory clinic who were followed an average of 13 months has been published. The 11.4% of participants with antithyroid antibodies had similar outcomes at 12 months with respect to IADLs, decline in IADLs, MMSE and MoCA scores, and transfer to residential care.

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LETTERS TO THE EDITOR

New dorsiflexion measure device: A simple method to assess fall risks in the elderly

Dear Editor,

Hip fracture is the third leading cause yielding bedridden status in Japan, and more than 80% of hip fractures are reported to be caused by falling. There are a variety of causes for falls in the elderly, and one of the significant causes is the inability to lift their toes when they walk. Here, we show a new device to measure dorsiflexion angle, an instrument that we developed to assess fall risks in the elderly.

Participants were requested to stand up straight and step back until the hip leaned on the wall (Fig. 1a). The fulcrum of the instrument was adjusted to the center of the external malleolus (Fig. 1b). The arm of the instrument was set to stay level, adjusting the branching thin arm placed on the ridge of the dorsum of the foot. Then, participants were asked to dorsiflex as much as possible. The mean time to measure bilateral dorsiflexion angles was within 5 min.

We measured dorsiflexion and Fall Risk Index (FRI),[1,2] including the history of falls within the past year, in 131 women (46–89 years, mean age 78.0 ± 7.1 years) and 88 men (46–93 years, mean age 76.2 ± 8.6 years) who visited the fall prevention clinic in Kyorin University Hospital. The occurrence of falls within the past year was 35.6%. Falls occurred 2.0 ± 0.1 times in fallers within 1 year, and women fell more frequently than men (42.7% *vs* 25.0%, $\chi^2 = 7.2$, $P \leq 0.01$). The average FRI score was 6.7 ± 3.4 in non-fallers and 10.6 ± 3.0 in fallers ($P < 0.0001$). Women showed a higher FRI score than men (8.8 ± 3.6 *vs* 7.0 ± 3.8, $P = 0.003$).

This new device appears promising in detecting the high-risk group of fallers, because the dorsiflexion angle was significantly smaller in fallers than non-fallers (right 9.6 ± 8.4 *vs* 13.7 ± 9.6 degrees, $P = 0.012$; left 10.0 ± 8.5 *vs* 14.2 ± 9.8 degrees, $P = 0.014$). Furthermore, the occurrence of falls was more frequent as the dorsiflexion angle decreased in women ($\chi^2 = 6.4$, $P = 0.042$; Fig. 1c), and half of the subjects, whose dorsiflexion angle was less than 10 degrees, experienced falls within a year.

Previously, it was reported that hip fractures occur more frequently in women than men, even though the incidence rate of falls was comparable until the age of 90 years. This is considered to be a result of the higher prevalence of osteoporosis in women.[3] In contrast, the present study found that women less than 90 years-of-age fell more frequently than men in the Japanese population of this age group. We also found that the FRI score was higher in women than men, as has been shown previously.[4] In addition, dorsiflexion angle was

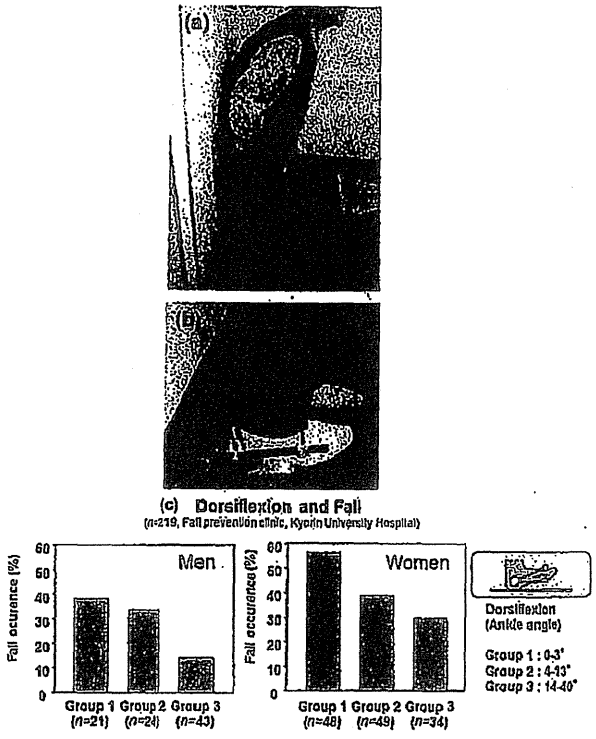

Figure 1 (a,b) How to measure dorsiflexion angle using a dorsiflexion measure device. (c) The relationship between dorsiflexion angle and the occurrence of falls within the past year. In men and women respectively, participants were grouped by tertile according to the dorsiflexion angle.

smaller in women than men (right 10.3 ± 8.4 *vs* 15.2 ± 10.1 degrees, $P = 0.0001$; left 11.0 ± 8.5 *vs* 15.2 ± 10.4 degrees, $P = 0.0013$), and a stepwise increase in the fall occurrence rate according to the level of dorsiflexion angle was evident in women (not significant in men). These results show that less ability to dorsiflex would partly explain the sex difference in the occurrence of falls and ensuing hip fracture.

The new dorsiflexion measure device we report here is easy and less time-consuming to use, and will be sure to help identify a high-risk group of fallers in the elderly.

Disclosure statement

This study was approved by the Ethics Committee of Kyorin University School of Medicine. Accordingly, written informed consent was obtained from all patients. All authors contributed significantly to this work and are

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認知症の包括的アプローチ

Comprehensive care and research on memory disorders

国立長寿医療研究センター　病院長

鳥 羽 研 二

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認知症の包括的アプローチ

Comprehensive care and research on memory disorders

国立長寿医療研究センター　病院長

鳥羽研二*

高齢者医療の目標は医師の調査で、認知症に限らず、QOLの重視が最重点課題で、延命が最下位に位置づけられているのと対照的である。

平成20年5月1日に、今後の認知症対策をさらに効果的に推進し、「たとえ認知症になっても安心して生活できる社会を早期に構築する」ための「認知症の医療と生活の質を高める緊急プロジェクト」が発表された。骨子は、早期の確定診断を出発点とした適切な対応の促進であり、具体的には、

(1) 実態の把握
(2) 研究開発の加速
(3) 早期診断の推進と適切な医療の提供
(4) 適切なケアの普及及び本人・家族支援
(5) 若年性認知症対策

の五つの柱が掲げられている。

長寿科学研究朝田班による、認知症高齢者の実態調査の結果は、国民を震撼させる結果であった。高齢者の14.4%が認知症であるという罹患率は、高齢者人口に当てはめると400万人を超え、予備軍である軽度認知障害（Mild Cognitive Impairment; MCI）も同数存在することが初めて明らかになった。この結果は、認知症があらたな「国民病」であることを明確に示している。90歳以上では3/4以上が罹患する疾患に国民の不安は大きい。早期の予防戦略の充実、悪化阻止の新薬の開発の促進も重要であることは言をまたないが、開発に要する時間軸を考えると、発症した認知症患者に対する、医療関係者の根本的意識改革と、社会が認知症を「ありふれた疾患」として受け入れる準備が必要だろう。

全国に認知症疾患医療センターは170箇所以上整備されたが、この危機意識を共有してどこまで、面展開が出来ているかははなはだ疑問である。

認知症に関する不安と課題を以下に列挙した。

1) だんだん悪くなり、自分が自分でなくなっていく不安（認知機能）
2) 気分が荒れたり、落ち込んだりして、家族に迷惑がかかる（周辺症状）
3) 身の回りの世話ができなくなり、炊事や通院も人手を借りる（生活機能）
4) 尿を漏らしたり、転んだり、むせたりして入院するのでは（老年症候群）
5) 家族に迷惑をかけたくない（介護負担）
6) 家族以外に助けてくれるところはあるの？（介護保険、サービス利用）
7) 急に悪くなったとき、入院できるところはあるの（緊急対応）
8) 寝たきりになって施設で、胃瘻で生かされるの？（エンドオブライフケア）
9) 最初から最後まで親身になってみてくれるお医者さんは（かかりつけ医）
10) 国全体でもっと真剣にとりくんでくれないのか（医療、介護政策）

これらの要素に丁寧に答えることが、認知症に対する包括的アプローチであり、認知症疾患医療センターに国民が求めていることであろう。

平成24年6月18日、厚生労働省は副大臣のもと局横断的に「今後の認知症政策」について骨子を発表した。

1) 平易なスケールによる早期診断、患者の把握
2) 多職種チームによる早期相談ケア
3) かかりつけ医教育の充実
4) 家族教室の拡充

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5) 精神病院入院基準の明確化と早期在宅復帰
6) 精神病薬の使用ガイドライン策定
7) 認知症疾患医療センターの基準を緩め（身近型）6万人に一箇所整備

などとなっている。2) 新聞報道されたが、英国の制度を翻訳輸入しようとしていて、実証のないアイデアで実効性の検証はこれからである。

身近型認知症疾患医療センターの創設は、なにより現在の認知症疾患医療センターの実態調査で活動性が担保されていなければ、税金を用いた意味が問われよう。制度を充実させるのは、「人」であり、人を育てるには教育カリキュラムが必要である。サポート医—かかりつけ医対応力向上研修システムの成功に何を学べばいいのか？　残された少ない時間のなかで、早急にすべきことは明確であり、認知症の包括的アプローチに、産官学は「国民病」にどう連携して立ち向かうのかが問われている。

この論文は、平成24年7月28日（土）第26回老年期認知症研究会で発表された内容です。

監修 東京都健康長寿医療センター研究所自立促進と介護予防研究チームリーダー 粟田主一

第7回

国立長寿医療研究センター「もの忘れセンター」と認知症診療ネットワーク

国立長寿医療研究センター病院もの忘れセンター外来部長 櫻井 孝
国立長寿医療研究センター病院病院長 鳥羽研二

国立長寿医療研究センターの「もの忘れセンター」

2011年は新たな抗認知症薬が使用可能となり，認知症医療も新たな時代に入った。これまで「もの忘れ外来」では，認知症の鑑別診断を行い，薬物療法を始めることで完結することが多かった。しかし認知症高齢者の療養はそこから始まるのであり，多くの身体合併症や行動・心理症状(behavioral and psychological symptoms of dementia；BPSD)に苦しみながら療養を続けている。

わが国における認知症高齢者数はすでに14%とも推計され[1]，認知症は「ありふれた病気」である。厚生労働省は認知症医療における地域の拠点として，認知症疾患医療センターを全国に整備することを提言した。しかし精神科中心の施設が申請しているケースが多く，身体疾患が認知症の経過中に発症した場合の対応では，患者・家族のニーズに応えられているとは言い難い。一般病院の中で，認知症の専門外来と入院設備を有する認知症疾患医療センターをいかに機能させるかがキーとなる。

そこで認知症疾患医療センターの新たなモデルとなる「もの忘れセンター」を，国立長寿医療研究センター病院に開設した。私たちは診療目標を，患者・家族の目線から表1のように設定した。これらの機能をすべて有するもの忘れセンターを構築し実践することで，認知症の予防から終末期までを見据えた，切れ目のない医療サービスを提供する。患者・家族のあらゆる要望に応えられる「もの忘れセンター」である。本稿では私たちの試みを概説する。

1．もの忘れセンターの設備と人員

もの忘れセンターは外来部門，入院部門からなり，外来初診を担当する医師は17名(老年科7名，神経内科7名，精神科2名，脳外科1名：認知症学会および老年精神医学会の専門医は7名)である。神経放射線科，リハビリテーション科，循環器科，消化器科，骨代謝・整形外科が加わる。認知症専門看護師，心理士，作業療法士，精神保健福祉士(PSW)，薬剤師が専属で配置されている(図1)。これらのスタッフが同じ土俵の上で総合的に診療する。

検査機器としては，CT，MRI，脳血流シンチグラフィー，PET[FDG(fluorodeoxyglucose)，アミロイドイメージング]，近赤外分光法(near-infrared spectroscopy；NIRS)を用いた脳活動計測器，磁気刺激装置が設置されている。また脳脊髄液のアミロイドβ($A\beta$)$_{1\text{-}42}$，リン酸化タウの測定を行っている。

入院部門は，個室が10室，大部屋(4人床)が5室である。上記診療科のほか，すべての診療科の認知症患者が利用することが可能である。

2．認知症の診断と入院治療

もの忘れセンター外来には，1ヵ月に100名以上の新患患者が来院する(全予約制)。かかりつけ医からの紹介は約50%で，近隣の市町村をはじめ愛知県，東海全域から受診する。初診患者は心理士が総合機能評価を用いた問診・身体機能評価を行う(約1時間)。引き続き医師が診察を行う(30～60分)。血液検査，画像検査を行い，次回の再診日で検査結果と治療方針について担当医が説明する。初診時診断はすべてカンファレンスで決定される。入院部門では，認知症に合併した身体疾患，BPSDの治療，認知症の診断パス入院，レスパイト入院などに対応している。