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6- × 5- × 6-cm lobulated mass that extended to the posterior part of the stomach. Endosonography was performed and revealed a heterogeneous mass 55 × 52 mm in diameter, with smooth edges, arising from the muscularis propria of the stomach. Because these findings suggested the diagnosis of GIST, surgery was performed. Pathological evaluation of the resected specimen revealed GIST.

Despite being the most common nonepithelial benign neoplasm involving the GI tract, mesenchymal tumors are thought to constitute only 1% of primary GI cancers.<sup>1</sup> GISTs are most often located in the stomach and proximal small intestine but can occur in any portion of the alimentary tract, including occasionally in the omentum, mesentery, and peritoneum.<sup>2</sup> Their true frequency is unknown. The differential diagnosis of GIST is broad and can include leiomyosarcoma, leiomyoma, malignant melanoma, schwannoma, malignant peripheral nerve sheath tumor, fibromatosis (desmoid tumor), inflammatory myofibroblastic tumor, or even metaplastic (sarcomatoid) carcinoma. No physical findings specifically suggest the presence of a GIST. Some patients present with a palpable abdominal mass. Others may present with nonspecific physical findings associated with GI blood loss, bowel obstruction, or bowel perforation and abscess formation.

Gastric stromal tumors may arise anywhere but are most common in the fundus of the stomach. GISTs usually occur after the age of 50, but they can affect a broad age range and are disproportionately common in men.<sup>3</sup> All GISTs 2 cm in size or greater should be resected.

In conclusion, GIST is one of the rare causes of anemia in older adults. Suspected submucosal mass lesions detected during upper endoscopic examination should be evaluated using endoscopic ultrasonography, and surgery must be performed before the tumor becomes lart.

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## SELF-RATED HEALTH AND COMPREHENSIVE GERIATRIC FUNCTIONS IN COMMUNITY-LIVING OLDER ADULTS IN JAPAN

*To the Editor:* We were deeply impressed by the article entitled “Thirteen Dimensions of Health in Elderly Sri Lankans: Results from a National Sri Lanka Aging Survey” by Østbye and colleagues.<sup>1</sup> The authors suggested that cultural context might influence the association between self-rated health (SRH) and health status. SRH is a useful prognostic measure for stratification of treatment allocations and is an important outcome measure, along with mortality, morbidity, and clinical outcomes. Furthermore, an assessment of overall health status can be a useful indicator of the patient's well-being.<sup>2</sup> To our knowledge, however, little is known about the association between SRH and comprehensive geriatric functions in Japan. We examined the association between SRH and health examination results, including comprehensive geriatric functions in community settings in Japan.

The study population consisted of 339 community-living people aged 65 and older (male:female = 127:212, mean age 77.7 ± 6.4) who participated in a yearly regular geriatric examination in T town, Kochi Prefecture, Japan. SRH was assessed with the following question, “How would you rate your current health status?” using a 100-mm visual analogue scale (worst = 0 to best = 100). Using the median SRH score of 58, we defined participants with a SRH score greater than 58 as the high SRH group and those with a score of 58 or less as the low SRH group. To assess basic activities of daily living (ADLs), participants rated their independence in performing seven items (walking, ascending and descending stairs, eating, dressing, using the toilet, bathing, and grooming), based on a scale ranging from 3 to 0 (3 = completely independent, 2 = need some assistance, 1 = need much assistance, 0 = completely dependent). Scores were summed to obtain a basic ADL score (0–21), in which low scores indicate disability.<sup>3</sup> To assess advanced functional ability, the Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC) rating scale of 0 to 13 was used.<sup>4</sup> The TMIG-IC scale includes scores for instrumental self-maintenance (0–5), intellectual activity (0–4), and social role (0–4). Walking ability and physical balance were assessed using the Timed Up and Go Test.<sup>5</sup> The Mini-Mental State Examination<sup>6</sup> was used to assess cognitive status. Assessment of medical conditions involved self-reported medication use and physician-based diagnosis of chronic conditions, including hypertension, diabetes mellitus, and obesity. Participants with an average blood pressure of 140/90 mmHg or higher, based on two measurements in a seated position, or who were taking anti-hypertensive medication were defined as having hyper-

**Table 1. Comparison of Comprehensive Geriatric Functions in Older Adults with High Self-Rated Health and Those with Low Self-Rated Health**

Characteristic	Self-Rated Health		P-Value
	High (>58) (n = 166)	Low (≤ 58) (n = 173)	
Age, mean ± SD	77.2 ± 6.7	78.1 ± 6.0	.22
Female, %	57.8	67.1	.08
Average monthly income, Japanese yen, mean ± SD	147,211.6 ± 191,707.4	80,112.7 ± 54,908.1	.005
Spouse alive, %	64.7	59.9	.39
Living alone, %	19.3	23.3	.37
Lifestyle, %			
Current drinker	33.8	25.8	.13
Current smoker	7.9	5.7	.44
Working once or more a week	89.4	80.5	.02
Exercise once or more a week	83.5	71.8	.01
Good sleep	59.9	47.1	.02
Functional ability, mean ± SD			
Activity of daily living score (range 0–21)	20.8 ± 0.7	20.0 ± 2.1	<.001
Tokyo Metropolitan Institute of Gerontology Index of Competence (range 0–13)	11.7 ± 1.9	10.8 ± 2.6	<.001
Self-maintenance (range 0–5)	4.8 ± 0.8	4.5 ± 1.2	.02
Intellectual activity (range 0–4)	3.5 ± 0.9	3.0 ± 1.2	<.001
Social role (range 0–4)	3.5 ± 0.9	3.2 ± 1.1	.01
Neurobehavioral function, mean ± SD			
Timed Up and Go, seconds	13.0 ± 3.8	15.7 ± 6.9	<.001
Handgrip strength, kg	25.5 ± 7.9	22.3 ± 7.8	.001
Mini-Mental State Examination score	26.1 ± 3.8	25.3 ± 4.0	.13
Current medical conditions, %			
Hypertension	61.3	70.0	.10
Diabetes mellitus	18.0	21.4	.54
Obesity	25.3	35.8	.04
Taking antihyperlipidemic drug	16.7	21.0	.32
Past medical history, %			
Stroke	6.5	16.2	.008
Fracture	21.2	24.8	.44
Osteoarthritis	39.9	49.4	.09
Ischemic heart disease	6.8	15.4	.02
Cancer	8.0	4.8	.27
Geriatric Depression Scale score (range 0–15)			
Mean ± SD	3.0 ± 2.8	5.9 ± 3.7	<.001
≥ 6, %	18.8	51.6	<.001

(Continued)

**Table 1. (Contd.)**

Characteristic	Self-Rated Health		P-Value
	High (>58) (n = 166)	Low (≤ 58) (n = 173)	
Frequency of laughter score, mean ± SD (range 0–9)	5.7 ± 2.2	5.1 ± 2.6	.02
Quality of life score, mean ± SD (range 0–100)			
Relationship with family	83.0 ± 15.5	71.9 ± 22.0	<.001
Relationship with friends	81.6 ± 15.3	71.0 ± 20.2	<.001
Financial satisfaction	60.0 ± 20.5	42.8 ± 21.3	<.001
Subjective happiness	71.1 ± 17.7	54.2 ± 18.9	<.001

Student *t*-test for continuous variables, chi-square test for categorical variables.

SD = standard deviation.

tension. Diabetes mellitus was defined as a fasting blood sugar level of 126 mg/dL or more, or a 2-hour blood sugar level of at least 200 mg/dL according to an oral glucose tolerance test in accordance with World Health Organization criteria. Participants with a body mass index of 25.0 or higher were categorized as obese.

The 15-item Geriatric Depression Scale (GDS-15) was used to assess depression; depression was suspected in participants with a score of 6 or higher.<sup>7,8</sup> The frequency of laughter score was also obtained (0–9).<sup>9</sup> Four indicators of quality of life (relationship with family, relationship with friends, financial satisfaction, and subjective happiness) were rated on a 100-mm visual analogue scale (worst = 0 to best = 100).<sup>10</sup> Socioeconomic characteristics, lifestyle factors, and past medical histories were also examined.

Statistical analysis was performed using the unpaired *t*-test for continuous variables and the chi-square test for categorical variables. All data were analyzed using the SPSS statistical software package for Windows (version 15.0, SPSS, Inc., Chicago, IL).

Table 1 compares comprehensive geriatric functions of the high and low SRH groups. Elderly people with high SRH had significantly higher income and higher scores for each ADL item than those with low SRH. Furthermore, elderly people with high SRH exhibited significantly better scores on the Timed Up and Go Test, greater handgrip strength, lower GDS-15 scores, higher frequency of laughter scores, and significantly higher subjective quality-of-life scores. Although there were significant differences in working status, physical exercise, sleep condition, and history of stroke or ischemic heart disease between elderly participants with high and low SRH, no significant differences in age, sex, cognitive function, and medical conditions, except obesity, were found.

These findings demonstrate that SRH in community-dwelling older adults in Japan is associated with mental health, functional ability, economic status, some lifestyle characteristics, and medical history but not with medical conditions, except for obesity. This suggests that some objective medical dimensions are not reflected in SRH perceived by community-living older adults in Japan,

indicating that medical examinations are useful for detecting early unperceived medical conditions and prevention of disease.

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#### ACCURACY OF FLUOROPROPYL-2 $\beta$ - CARBOMETHOXY-3 $\beta$ -(4- IODOPHENYL) NORTROPANE DATSCAN FOR THE DIAGNOSIS OF LEWY BODY DEMENTIA

*To the Editor:* Dementia with Lewy bodies (DLB), the second main cause of dementia after Alzheimer's disease, is responsible for 15% to 25% of neurodegenerative dementia. Diagnosis at an early stage is sometimes difficult. Diagnostic criteria have been established and reviewed to facilitate diagnosis.<sup>1</sup> Evaluation of dopamine transporter with fluoropropyl-2 $\beta$ -carbomethoxy-3 $\beta$ -(4-iodophenyl) nortropane (single photon emission computed tomography (SPECT)), referred to as DaTSCAN (General Electric Health Care, Chalfont St. Giles, UK), appears useful in differentiating Alzheimer's disease from DLB.

An 84-year-old woman presented with a 2-year fluctuating cognitive decline associated with recurrent visual hallucinations. Her neurological examination was normal. Her past medical history included chronic atrial fibrillation and hypertension. The first suspected diagnosis was Alzheimer's disease because of the progressive evolution and the neuropsychological test showing altered episodic memory. Her Mini-Mental State Examination score was 25. Her brain computed tomography (CT) scan showed global atrophy. Treatment with a neuroleptic drug was started to reduce hallucinations but was stopped because of worsening cognitive decline.

The patient was transferred to the Geriatrics Department at CHU La Miletrie, Poitiers, France. Clinical examination did not show any parkinsonism. Daily visual hallucinations continued. The patient exhibited a misidentification delusion (Capgras syndrome), because she believed she saw her son's double. Biological blood testing was normal. Electroence-

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## MOOD DISORDERS IN COMMUNITY-DWELLING OLDER ADULTS IN ASIA

*To the Editor:* The article entitled, “Achieving effective antidepressant pharmacotherapy in primary care: the role of depression care management in treating late-life depression,” by Bao and colleagues<sup>1</sup> deeply impressed us and led us to think back to an article entitled, “Reducing suicidal ideation in depressed older primary care patients,” by Unützer and colleagues.<sup>2</sup> In Japan, 1998 marks the beginning of the third wave of increased suicides (>30,000 per year), which was preceded by a second (1980–1983) and first (1947–1951) wave.<sup>3</sup> Each wave in Japan was closely associated with periods of economic depression.<sup>4</sup> The third wave of suicides in Japan began soon after the Asian economic crisis of 1997, which was reported to be closely associated with depression and suicide in some

Asian countries.<sup>5</sup> The Japanese government has reported that suicides in Japan in 2007 were associated with old age (37%), health concerns (44%), and depression (18%).<sup>3</sup> A screening-based investigation revealed that depression in community-dwelling older adults was closely associated with more difficulty in performing activities of daily living (ADLs) and lower quality of life (QOL) both in Japan<sup>6</sup> and in other Asian communities.<sup>7</sup> Although old age, health problems, and depression may be commingled, the reported prevalence of depression in older adults in Asian countries varied.<sup>8–10</sup>

The findings of a study using screenings and interviews to investigate the prevalence of depression in community-dwelling older adults (aged  $\geq 60$ ) in six Asian communities: Urausu, Japan (n = 729); Hong Chong, Korea (n = 329); Phuto district, Vietnam (n = 387); Savannakhet, Laos (n = 294); Maubin, Myanmar (n = 336); and Khon Kaen, Thailand (n = 407) are reported here (Table 1). The surveys were conducted from 2004 to 2007. All participants were first screened using a 15-item Geriatric Depression Scale (GDS) translated into the local language. Japanese psychiatrists interviewed participants with GDS scores of 6 or higher and diagnosed them based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria. Statistical analysis was performed using StatView version 5 for Macintosh (SAS institute, Inc., Cary, NC). Analysis of variance was used for continuous variables in six groups, and the chi-square test was used for categorical variables.  $P < .05$  was used to indicate statistical significance (analysis of variance comparing multiple variance).

Table 1 shows mean GDS scores, prevalence of participants with GDS scores of 6 and higher and of 10 and higher and prevalence of mood disorders diagnosed based on DSM-IV criteria. Although mean GDS score, the prevalence of participants with GDS scores of 6 and higher, and prevalence with GDS scores of 10 and higher varied between communities, the prevalence of elderly participants diagnosed with mood disorders was similar (6.2–9.6%). Many elderly people with depression had subjective experiences of illness, but few elderly participants in the surveyed population, including Japan, consulted psychiatrists or took antidepressant medications.

**Table 1. Comparison of Geriatric Depression Scale Scores and Prevalence of Mood Disorders of Community-Dwelling Older Adults in Six Asian Communities**

Variable	Urausu Japan (N = 728)	Hong Chong Korea (N = 329)	Phuto Vietnam (N = 387)	Savannakhet Laos (N = 294)	Maubin Myanmar (N = 336)	Khon Kaen Thailand (N = 407)	P-#
Age, mean $\pm$ SD	74.4 $\pm$ 7.1	72.3 $\pm$ 6.1	70.8 $\pm$ 8.1	69.6 $\pm$ 7.6	70.3 $\pm$ 7.0	68.4 $\pm$ 6.7	<.001
Male/female, n/n	325/403	180/149	175/212	121/173	175/161	265/141	<.001
Geriatric Depression Scale (GDS) score (range 0–15)							
Mean $\pm$ SD	4.4 $\pm$ 3.2	5.4 $\pm$ 4.2	3.4 $\pm$ 2.7	5.5 $\pm$ 2.8	3.7 $\pm$ 3.1	4.1 $\pm$ 3.1	<.001
$\geq 6$ , %	42	40	17	36	23	27	<.001
$\geq 10$ , %	8	20.5	7.6	6.5	7.6	9	<.001
Prevalence of mood disorders diagnosed by psychiatrists, %*	9.0	9.6	7.2	7.8	6.7	6.2	<.001

\*Based on Diagnostic and Statistical Manual of Mental Disorders Fourth Edition.

SD = standard deviation.

#P-values were calculated by using analysis of variance (ANOVA) for continuous variables and chi-square tests for categorical variables. ANOVA gave a statistical test of whether the means (mean age or score in GDS) of several groups were all equal, and therefore generalized Student's two-sample t-test to more than two groups.

Although a study population that is not necessarily representative enough to compare the prevalence of depression cross-culturally between communities limits these data, 6.2% to 9.6% of elderly participants in this study were diagnosed with mood disorders based on DSM-IV criteria. More attention should be given to the practical application of standard criteria for screening and diagnosis of depression, which will be beneficial for early detection and consideration of follow-up and intervention in elderly patients with mood disorders in primary care and community settings in Asia.

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## LETTER TO THE EDITOR

# Farsightedness (presbyopia) in a wild elderly chimpanzee: The first report

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Dear Editor,

The chimpanzee (*Pan troglodytes*) is one of four genera in the family Hominidae, which also includes humans, gorillas and orangutans. Approximately 340 chimpanzees live in captivity in Japan and of these, only two chimpanzees are estimated to be older than 50 years old while the chimpanzees in the wild live for approximately 50 years.<sup>1</sup> The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was ratified in 1980 in Japan, so the captive study of chimpanzee elders is limited. Important differences exist between chimpanzees raised in the wild and those raised in captivity. For example, chimpanzees born in the wild acquire social skills and knowledge from their mothers and the elder members of the community, while chimpanzees born in captivity and raised by humans do not have the ability to communicate well with other chimpanzees. As a result, chimpanzees raised by humans frequently abandon their babies when they become mothers. In that sense, it is very important for the chimpanzees to be grown up in a community with elder members. From the standpoint of research on the biology of human aging, it is important to observe aging in chimpanzees, who are the closest evolutionary relatives of humans, especially in a wild setting. Observing research on behavior of elderly chimpanzees in wild settings may be useful not only in the preservation of this endangered species but also in detecting geriatric syndrome in the chimpanzee related to that in human beings.

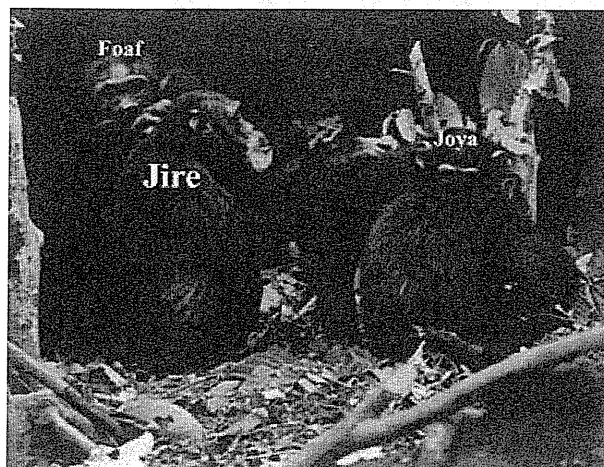
In the Bossou district in Guinea, West Africa, a group of 13 wild chimpanzees has been studied since 1976. Each individual in the group has been identified and

named, and its age has been confirmed or estimated. These chimpanzees coexist with humans in the primary and the secondary forests near the small hills surrounding the village of Bossou.<sup>2</sup> Bossou chimpanzees sometimes raid the farms and orchards to eat cultivated fruits. However, the chimpanzees have no predators in this area and they are not hunted by the villagers. Thanks to the long-term research, Bossou chimpanzees are fully habituated to humans and we have the record of each individual in the past four decades.<sup>2</sup> Six of these chimpanzees are estimated to be more than 40 years old, and three are believed to be at least 50 years old.

From 23–30 December 2008, we carried out the intensive observation focusing on the old female chimpanzee named Jire. She was estimated to be 50 years old. We did the focal animal sampling following the particular individuals at close range, from early morning till the time of sleeping in the beds in the tree, approximately 12 h a day. During the observation, we focused on the grooming behavior, a form of communication in chimpanzees.<sup>3</sup> In terms of the grooming skill, the eye-hand coordination is very important. We carried out a quantitative observational study of behaviors of the chimpanzee every 5 min. Nineteen grooming scenes of Jire were recorded among a total 862 records of her behavior, of which 104 were missed records.

Following the focal observation, we noticed that the female chimpanzee named Jire groomed her daughter Joya with her eyes focusing at a distance of 40–50 cm. This makes a clear contrast to the younger chimpanzee Foaf (aged 27 years) that groomed with his eyes focusing directly on and close to (10–20 cm) the grooming spot (Fig. 1). Distance estimation of grooming eye spot was measured by video-photo analysis. Other old chimpanzees aged approximately 50 years or over also groomed with their eyes focusing at a longer distance than younger ones. Because chimpanzees remove very small

*Author contributions:* all authors participated in the research in Bossou, Guinea in 2008–2009, and discussed the findings.



**Figure 1** Jire (~50 years old) kept her eyes focused at a longer distance (40–50 cm) with her arm extended while grooming her daughter Joya, on the other hand Foaf (28 years old) kept his eyes focused closely (10–20 cm) while grooming Jire.

insects like lice from fur during grooming, they typically focus their eyes closely.<sup>4</sup> The previous study reported that the visual acuity of the chimpanzee is approximately 1.5, comparable to humans.<sup>5</sup> Thus, we strongly suspected that the grooming behavior of the old chimpanzee must be a symptom of farsightedness (i.e. experienced presbyopia) like an elderly human.

Hearing disturbance<sup>6</sup> and chewing ability<sup>7</sup> are closely associated with lower activities of daily living and with lower quality of life in community-dwelling human elderly. Presbyopia is caused by a decline in the accommodation of the lens. Visual impairment in humans is associated with social isolation and increased risk of depression,<sup>8</sup> and presbyopia correction with an assistive device has been reported to improve human disability and depression.<sup>9</sup> The similarity of accommodative mechanisms between human and monkeys have been reported by some researchers in ophthalmokinetic examinations, but not in clinical or field-setting study.<sup>10</sup> Bito *et al.* has reported the use of the rhesus monkey as an animal model for presbyopia.<sup>11</sup> However, the underlying mechanisms of presbyopia development in monkeys are thought to differ from those of humans.<sup>12</sup> In monkeys, presbyopia is recognized only by examining lens thickness, intraocular pressure, accommodative amplitude and other ocular dimensions, but clinical or

field-setting symptoms remain unknown. Based on our observations, we believe that old chimpanzees must have developed presbyopia. This may be the first report of the observation of clinical presbyopia in chimpanzees in the wild. Although presbyopia in chimpanzees has only been observed to disrupt grooming behavior until now, the future study on the age-related physiological decline and dealing with a disabled state in chimpanzees may provide a clue for understanding human geriatrics and gerontology.

## Acknowledgments

We cordially thank all native researching assistants in Bossou for their helping our close observation. We also thank Ms S Carvalho for her useful advice.

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## 2. 地域における転倒の実態

### SUMMARY

■地域在住高齢者の転倒の実態を評価し、易転倒性の関連リスク因子として、高齢、ADLの障害、抑うつが示唆され、転倒を評価するために、厚生労働省研究班作成による「転倒リスクスコア」が有用であることを示した。「転倒リスクスコア」は、高齢者の転倒リスクを評価するために開発されたものであるが、転倒のみならず、加齢、ADL、高次の活動能力指標、うつ状態、主観的QOLなど、高齢者の総合的Frailtyを反映している可能性があることを示した。また、長期にわたる運動が、将来の転倒に対して予防的効果を有する縦断的検討の結果を紹介した。

松林 公蔵

### はじめに

われわれ人間の祖先は、約700万年前にアフリカの草原で誕生し、約200万年前にはホモエレクトスとして直立二足歩行を開始したとされる。長い進化の過程のなかで、ヒトが二本足でたって直立姿勢を保ち、二本足で歩行する能力を獲得したことは、ヒトが言語能力を獲得したこととならんで、ヒト化(hominization)の重要なメルクマールである。直立歩行は、手による道具の使用を通じて狩猟・採集活動を効率化し、ひいては脳の重量を増加させることにも寄与した。ヒトで直立二足歩行が可能となるためには、進化の過程で、骨盤骨の形態学的変化とともに姿勢反射という複雑な能力を獲得する必要がある。ヒトの個体発生過程でも、乳幼児が安定した姿勢反射能力を獲得するためには数年の成長年月を必要とする。そしてひとたび獲得したヒトの直立二足歩行の安定性は、高齢期の老化の進行とともに衰退する。高齢者で問題となる転倒は、加齢に伴う姿勢反射の障害がその主要な要因であり、神経系の老化は、高度に進化した神経機能が最も大きく影響を受ける。

高齢期に認められる病的な起立・歩行・姿勢の障害としては、神経系の病変部位によって、片麻痺、対麻痺、運動失調、パーキンソン病に伴う姿勢反射障害など様々なパターンを呈する。このような病的な起立・歩行障害を評価する方

法としては神経学的診察が有効であるが、生理的加齢に伴う姿勢反射の障害による易転倒性の評価は、古典的な神経学的診察のみでは不十分な場合も少なくなく、易転倒性をターゲットとした高齢者総合的機能評価(Comprehensive Geriatric Assessment: CGA)が重要となる。

### 地域在住高齢者における転倒の実態とCGA

高知県T町在住の65歳以上の高齢者1,261名(平均75.4歳)について、転倒の実態を調査してみると、転倒しない群862名に対して、何らかの易転倒者が399名(31.6%)存在した。この易転倒群と非転倒群において、基本的ADL 7項目の日常生活機能(歩行、階段昇降、摂食、排泄、入浴、更衣、整容)を、3点(完全自立)から0点(完全介助)までの4段階で評価(0~21点)、ならびに老研式活動能力指標13項目とその下部尺度である手段的活動能力(5項目)、知的能動性(4項目)、社会的役割(4項目)スコアを示したのが表1である<sup>1)</sup>。易転倒群は非転倒群に比して有意に年齢が高く、また年齢を調整してもすべてのADL項目について有意に低いスコア値を示した。また、両群において、15項目のGeriatric Depression Scale(GDS)によるうつのスコアとGDS $\geq$ 10点以上の割合、さらにVisual Analogue Scale(VAS)を用いた主観的

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表1 地域在住高齢者における易転倒者と非転倒者における日常生活機能の比較

	易転倒者 n=399(31.6%)	非転倒者 n=862(68.4%)	p 値
年齢	76.9±7.5	74.7±6.9	<0.001
性比(男性：%)	40.2	42.6	0.4
ADL			
基本的 ADL(0~21)	19.1±3.5	20.2±2.5	<0.001*
老研式活動能力指標(0~13)	9.3±3.8	10.7±3.2	<0.001*
手段的活動能力(0~5)	4.0±1.6	4.4±1.3	<0.001*
知的能動性(0~4)	2.7±1.3	3.2±1.1	<0.001*
社会的役割(0~4)	2.8±1.4	3.2±1.2	<0.001*
抑うつ			
GDS-15(0~15)	6.5±4.1	4.3±3.7	<0.001
GDS-15≥10の割合(%)	26.8	11.6	<0.001
QOL			
主観的健康度(0~100)	47.7±21.8	56.7±20.9	<0.001
家族関係の満足度(0~100)	72.3±21.7	76.9±20.3	<0.001
友人関係の満足度(0~100)	69.5±23.1	74.3±20.7	<0.001
経済満足度(0~100)	43.8±24.9	51.2±23.8	<0.001
主観的幸福度(0~100)	54.8±22.0	62.0±21.5	<0.001

(文献1より引用)

QOL 5 項目(主観的健康度, 家族関係の満足度, 友人関係の満足度, 経済満足度, 主観的幸福度)を比較した。易転倒群は非転倒群に比して, うつ尺度が高く主観的 QOL が低い。すなわち地域在住高齢者において, 易転倒性は加齢ならびに ADL の低下, うつがあること, 主観的 QOL が低いことと関連のある事実が明らかとなった。

### 地域在住高齢者における転倒の実態評価と転倒リスクスコア

表2に, われわれが実施している自記式による転倒の実態評価と厚生労働省研究班作成の転倒リスクスコアを示した。転倒の実態評価は, “ほとんど転ぶことはない”, “ときどき転ぶ”, “よく転び生活上問題”, “転んで骨折やけがをしたことがある”の4段階評価として, “ほとんど転ぶことはない”を「非転倒群」, そのほかを「易転倒群」としている。転倒予測スコアの評価は, 厚生労働省研究班作成の22問のうち, 「過去1年間の転倒の有無」に関する質問を除いた21問から, Positiveな5質問に対しては, 「はい」に0点, 「いいえ」の1点を, Negativeな16問に対しては, 「はい」に1点,

「いいえ」に0点を配して加算した合計を転倒予測スコア(0~21点)と定義した。高知県T町の地域在住高齢者の易転倒群と非転倒群について, 転倒予測スコアを比較したのが図1である。転倒予測スコアを, 易転倒群と非転倒群で横断的に比較しても, 易転倒群では非転倒群に比して有意に転倒予測スコアが低いことがわかる。図2は, 高知県T町, 北海道U町, 三重県O町在住の65歳以上の高齢者4,773名(男:女=2,014:2,759, 平均75.5歳)について, 性・年齢別の転倒リスクスコアを示したものである。転倒スコアは, 加齢とともにDose-responsiveにスコアが増加し, 70歳以上ではすべての年齢階層において, 女性の方が男性よりも有意にスコアが高値を示した。「転倒リスクスコア」は, 高齢者の転倒リスクを評価するために開発されたものであるが, 同時に転倒のみならず, 加齢, ADL, 高次の活動能力指標, うつ状態, 主観的 QOL など, 高齢者の総合的 Frailty を反映している可能性がある<sup>2)</sup>。

表2 われわれが用いている転倒の実態評価と転倒予測(厚生労働省研究班作成)のための質問表

転倒実態の評価		
問 転ぶことがありますか	3. ほとんど転ぶことはない	
	2. ときどき転ぶ	
	1. よく転び生活上問題	
	0. 転んで骨折やけがをしたことがある	
転倒予測スケール(厚生労働省研究班作成)		
問 1 過去1年の間に転んだことがありますか	1. はい	
	2. いいえ	
	はいの場合転倒回数 ( 回/年, 場所:家中・外 )	
問 2 つまずくことがありますか	1. はい	2. いいえ
問 3 手すりにつかまらず, 階段の昇り下りができますか	1. はい	2. いいえ
問 4 歩く速度が遅くなってきましたか	1. はい	2. いいえ
問 5 横断歩道を青のうちに渡りきれますか	1. はい	2. いいえ
問 6 1キロメートルくらい続けて歩けますか	1. はい	2. いいえ
問 7 片足で5秒くらい立っていられますか	1. はい	2. いいえ
問 8 杖を使っていますか	1. はい	2. いいえ
問 9 タオルを固く絞れますか	1. はい	2. いいえ
問 10 めまい, ふらつきがありますか	1. はい	2. いいえ
問 11 背中が丸くなってきましたか	1. はい	2. いいえ
問 12 膝が痛みますか	1. はい	2. いいえ
問 13 目が見えにくいですか	1. はい	2. いいえ
問 14 耳が聞こえにくいですか	1. はい	2. いいえ
問 15 物忘れは気になりますか	1. はい	2. いいえ
問 16 転ばないかと不安になりますか	1. はい	2. いいえ
問 17 毎日お薬を5種類以上飲んでますか	1. はい	2. いいえ
問 18 家の中で歩くとき暗く感じますか	1. はい	2. いいえ
問 19 廊下・居間・玄関によけて通るものが置いてありますか	1. はい	2. いいえ
問 20 家の中に段差がありますか	1. はい	2. いいえ
問 21 日常生活で階段を使わなくてはなりませんか	1. はい	2. いいえ
問 22 生活上, 家の近くの急な坂道を歩きますか	1. はい	2. いいえ

\*問 2, 4, 8, 10~22については「はい」に1点を, 「いいえ」に0点を配し, 問 3, 5~7, 9については「はい」に0点を, 「いいえ」に1点を配し, 『転倒予測』を算出している。『転倒予測スコア』は0~21点に分布し, 点数の高い方が転倒しやすいと予測する。

われわれの検討では, 転倒予測スコア9/10点でカットオフとするとき, 将来の転倒予測の指標となることが示唆されている。

### 転倒予防のための長期運動教室 による介入

われわれは, 1990年から高知県のK町において地域在住高齢者に対する「健康長寿計画」を実施しており, 町村合併でK町がその歴史を閉じるまでの17年間の研究において, 地域在住高齢者の健康実態の推移を明らかにしてきた。その介入の一部として, 1993年以来, 運

動教室を開催している。運動教室は, 週2回各1時間のプログラムである。1993~2001年までの8年間に, 運動教室に参加した119名と非参加の878名について, 転倒に関する運動教室の長期効果を検討した<sup>3)</sup>。その結果, 運動教室参加群は非参加群に比して, 8年後の転倒の状況, ADLの自立が有意に良好に保たれていた。また, 長期の運動教室への参加が将来の転倒予防に対して有効であることが明らかとなり, 運

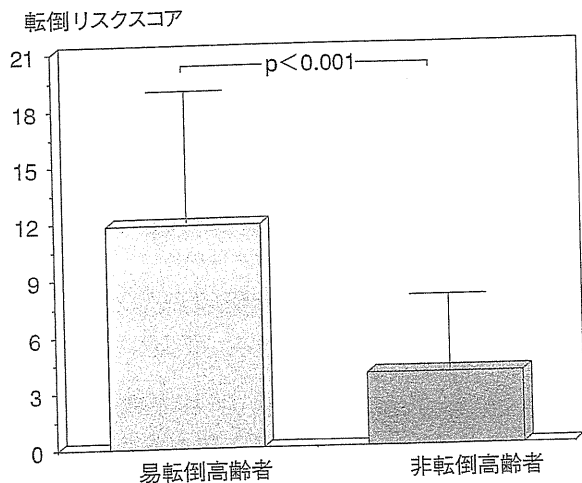


図1 易転倒高齢者と非転倒高齢者における転倒リスクスコアの比較

動教室参加以外の将来の易転倒性のリスクとなる要因を検討すると、女性であること、ADLが自立していないこと、抑うつがあること、降圧薬以外の Multi-pharmacy などが、将来の転倒のリスクとなる可能性が示唆された。

### おわりに

地域在住高齢者の要介護発現を予防するためにも、高齢者の易転倒性を評価し、将来の転倒に対する転倒リスクスコアを活用して、転倒のためのリスクを改善することが重要である。長期にわたる運動の、将来の転倒に対する予防的効果が確認されたので、高齢者が運動を持続できるような仕掛けが必要であろう。そのためには、自治体の保健事業として運動教室のインフラを整備するだけでなく、高齢者が運動を継続するためのインセンティブを高めるような工夫も重要である。運動教室への参加により介護保

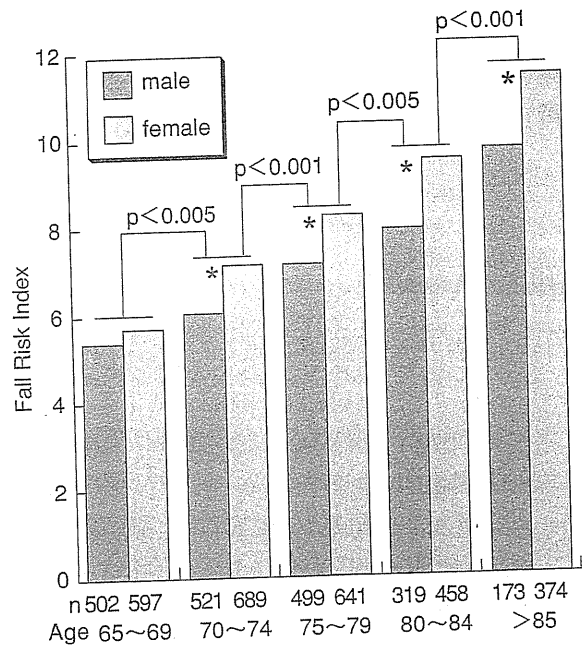


図2 地域在住高齢者における転倒リスクスコアと年齢・性との関連(文献2より引用)

険料の一部控除などの制度が考案されると、実効のある施策となると思われる。

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# 1. メタボリックシンドロームは転倒の危険因子か？

## SUMMARY

■メタボリックシンドロームは肥満、耐糖能異常、脂質異常症、高血圧を合併する動脈硬化易発症状態であり、2型糖尿病や心血管病のリスク因子として重要である。しかし、大規模研究のレビューによると、メタボリックシンドローム診断やその各因子である内臓肥満、耐糖能異常、脂質代謝異常、高血圧は転倒の危険因子としての報告はこれまでにない。一方で、起立性低血圧は既知の転倒危険因子である。国内高齢者の縦断研究の検討では、高血圧はむしろ転倒リスクを下げる傾向が認められた。転倒予防の観点からは、高血圧治療の際に起立性低血圧の出現に留意することが重要である。

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## メタボリックシンドロームの疫学

メタボリックシンドロームは肥満、耐糖能異常、脂質異常症、高血圧を合併する動脈硬化易発症状態であり、2型糖尿病や心血管病のリスク因子として重要である。1998年にWHOが初めて診断基準を発表してから複数の診断基準が欧米から発表されているが、日本人に即したのものとしては現時点でメタボリックシンドローム診断基準検討委員会<sup>a</sup>によるもの(表1)が一般に使用されている<sup>1)</sup>。しかしながら、この基準ではウエスト径の閾値が男性で85 cm以上、女性90 cm以上と定めており、海外の諸基準とは逆に女性よりも男性により厳しいものとなっている。国際比較のためには改訂NCEP-ATP III<sup>b</sup>が定めるアジア人のための診断基準(腹囲男性90 cm以上・女性80 cm以上、血圧130/85 mmHg以上、中性脂肪150 mg/dL以上、HDL-C

男性40 mg/dL・女性50 mg/dL未満、空腹時血糖100 mg/dL以上の5項目中3項目以上)<sup>2)</sup>や、国際糖尿病連合(IDF)が定める日本人基準(前述の腹囲条件が必須かつ、ほか4項目中2項目以上)が使用されることも多い。国内のメタボリックシンドロームの有病率については、40歳以上の成人2,452名を対象とした久山町研究<sup>3)</sup>において(改訂NCEP-ATP III基準)、男性21%、女性30%と報告されているが、Kuzuyaraの報告<sup>4)</sup>によると、60~69歳で男性9.6%、女性7.8%、70歳以上で男性7.4%、女性7.2%(日本基準)となっている。また国外では、加齢とともにメタボリックシンドロームの有病率は増えると報告されているが<sup>5)</sup>、国内での検討では男性では50~59歳、女性では60~69歳の有病率が最も高いとことが報告されている<sup>4)</sup>。

## 転倒リスク因子としてのメタボリックシンドローム—大規模研究のレビューより—

メタボリックシンドロームは、老年症候群において重要な「転倒」の危険因子でもあるのか否か？ 高齢者転倒のリスクファクターに関する大規模研究のレビューでは、「転倒の既往」が最大のリスクであるほか、内的要因として筋

<sup>a</sup> メタボリックシンドローム診断基準検討委員会は日本動脈硬化学会、日本肥満学会、日本糖尿病学会、日本高血圧学会、日本循環器学会、日本内科学会、日本腎臓病学会、日本血栓止血学会の8学会からなる。

<sup>b</sup> National Cholesterol Education Program Adult Treatment Panel IIIの略。

表1 メタボリックシンドロームの診断基準(JASSO:2005年)

ウエスト周囲径が男性 85 cm 以上/女性 90 cm 以上で、かつ下記の A・B・C のうちの 2 項目を満たす。

- ・A. 脂質異常…中性脂肪 150 mg/dL 以上あるいは HDL-C 40 mg/dL 未満
- ・B. 血圧異常…最高血圧 130 mmHg 以上あるいは最低血圧 85 mmHg 以上
- ・C. 糖代謝異常…空腹時血糖 110 mg/dL 以上

表2 メタボリックシンドローム各因子と1年後の転倒(高知県土佐町地域在住高齢者304名の縦断的検討)

危険因子	オッズ比(95%CI)	p
ウエスト $\geq$ 85 cm(男性)または $\geq$ 90 cm(女性)	0.7(0.3~1.5)	0.2
血圧 130/85 mmHg 以上	0.5(0.3~1.0)	0.07
中性脂肪 150 mg/dL 以上または HDL-C 40 mg/dL 未満	0.9(0.4~2.2)	0.9
血糖 110 mg/dL 以上	1.0(0.5~2.2)	0.9
メタボリックシンドロームあり	0.7(0.4~2.2)	0.6

ロジスティック回帰分析。各因子年齢補正後。

力低下, バランス欠如, 歩行障害, 移動障害, 基本的日常生活機能(ADL)低下, 認知機能障害, 起立性低血圧, 視力低下などが多くの研究で一致した危険因子である<sup>6-8)</sup>。しかしながら, メタボリックシンドロームの各因子である内臓肥満, 高血圧, 耐糖能異常, 脂質代謝異常は転倒リスクとしてこれまで報告されていない。

### 地域在住高齢者におけるメタボリックシンドロームと1年後転倒との関連

筆者らは高知県土佐町のコホート研究において, 総合機能評価法(CGA)の中で転倒のリスクファクターの検討を続けている<sup>9)</sup>。2006年には65歳以上の高齢者を対象に, 腹囲測定を含めたメタボリックシンドローム検診を行って1年後の転倒を総合機能評価の中で評価した。このうち, 1年後に転倒頻度を評価できた304名について, メタボリックシンドローム診断と内臓肥満(腹囲男性85 cm以上, 女性90 cm以上), 高血圧(130/85 mmHg以上), 脂質代謝異常(中性脂肪150 mg/dL以上またはHDL-C 40 mg/dL未満)耐糖能異常(FBS 110 mg/dL以上)のそれぞれが, 1年後の転倒と有意に関連するかどうかロジスティック回帰分析を行って検討した(表2)。その結果, 130/85 mmHg以上の高血圧

のある者は, 1年後の転倒リスクが低くなる傾向(p=0.07)を認めたが, そのほかのメタボリックシンドローム各因子とメタボリックシンドローム診断は, 有意な転倒危険因子とはならなかった。2006年には65歳以上高齢者369名を対象に経口糖負荷試験(75g OGTT)を施行したが<sup>10)</sup>, 正常群, 耐糖能異常群, 糖尿病群, それぞれの転倒スコア(転倒既往を除いた21点満点)の平均値を比較しても, 3群で有意な差を認めなかった(ANOVA p=0.37)。

起立性低血圧が転倒のリスクとして報告されていることと, 高血圧が転倒リスクを軽減する方向にあるということに合わせて考えると, 高血圧治療は転倒予防の観点からは慎重に行うべきといえる。2008年4月から後期高齢者医療制度と同時に始まった, いわゆる「メタボ健診」(特定健診・特定保健指導)は40~74歳の全国民に義務化されたが, 転倒のリスクファクターとしての関連性は認められず, むしろ高血圧の薬物治療については慎重に行うことが求められ, 転倒予防の観点からは起立性低血圧の有無についても積極的に検査すべきであるといえる。

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## 4. 地域在住高齢者の抑うつ —フィールド医学の視点から—

### SUMMARY

■地域在住高齢者の抑うつは、本邦でもアジア諸国でも、明らかにADL、QOLと関連する。過去において、うつ病はアルツハイマー病と同様に、精神科領域でのみ取り扱われる特殊な病態と考えられていた時代があった。しかし今や抑うつは、精神科を訪れたことのない一般地域在住高齢者の中にもしばしば認められる。抑うつは、薬物療法やカウンセリングなどを通じて治療可能である点において、精神医学のみならず老年医学にとっても重要な課題である。老年医学の領域で重要な課題は、“3D”，すなわち、①Disability, ②Dementia, ③Depression といっても過言ではない。

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### はじめに

本邦の自殺者数は1997年以来年間3万人を超え、1970年に最大の1万6,765人を記録した交通事故死亡者が2008年には5,155人に減少したこととよく対比される。戦後の日本の自殺者の頻度には3つの時代的ウェーブがあり、第三の波は1997年以来現在まで続いている。社会学的には、いずれも経済的不況と関連しているとされ、また近年の日本人の自殺に関連する要因として、①高齢、②健康障害、③抑うつが指摘されている。しかし、老年医学の立場から考えると、この3者は相互に重層するので、しるべき方法をとれば治療可能な抑うつへの評価・対策は重要である。1970年代には、うつ病はアルツハイマー病と同様に、精神科領域でのみ取り扱う特殊な病態と考えられていたが、今や、病院の精神科を訪れたことのない一般地域在住高齢者の中にもしばしば認められるようになった。老年医学の領域で重要な課題は、“3D”，すなわち、①Disability, ②Dementia, ③Depression といっても過言ではないだろう。

### 抑うつと Disease, Illness, Sickness

うつ病診断に関するDSM-IVやICD-10基準については、別稿で詳述されるであろうから、ここでは、フィールド医学の立場からのコメントのみにとどめる。うつ病の基本的特徴は、①悲しみと、②運動および思考の遅滞とされ、うつ病の記載はすべて、これらの2つの性格に当てはまる一般的症状を列挙し、次いで普通に合併するほかの徴候を付け加えたものである<sup>1)</sup>。特に、DSM-IV診断基準での一般的症状9項目に加えて担保されている「社会的、職業的な不適応」という1項は、うつ病の診断が人文・社会的な必要条件を含むことを明示している。

「病気」を表す英語には、語感を異にする3つの概念がある。Disease, Illness, Sicknessである<sup>2)</sup>。Disease(疾病)という語は、人間に何らかの症状を来す原因が何で、どのようなメカニズムによってその異状がもたらされたのか、どう対処すれば科学的に適切か、といった近代科学に基づいた原因志向的概念ともいえる。一方、Illness(やまい)という語は、疾病の結果として患者が体験する苦痛、自覚症状、不安など、患者の主観的体験のありようを重視する概念である。第3の病気の概念Sicknessという語感は、

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表1 うつ傾向があるか否か(GDS $\geq$ 10)によるADLならびにQOLの比較(京都府S町)  
(年齢補正後)

	うつ傾向なし (n=2,158)	うつ傾向あり (n=224)	p
年齢	73.7 $\pm$ 6.7	77.2 $\pm$ 8.1	<0.0001
性別(男性/女性)	893/1,265	100/124	ns
ADL			
基本的ADLスコア(21)	20.1 $\pm$ 2.8	18.1 $\pm$ 4.7	<0.0001
手段的ADLスコア(5)	4.3 $\pm$ 1.1	3.4 $\pm$ 1.8	<0.0001
知的ADLスコア(4)	3.4 $\pm$ 0.9	2.7 $\pm$ 1.3	<0.0001
社会的ADLスコア(4)	3.2 $\pm$ 1.1	2.0 $\pm$ 1.5	<0.0001
総合的高次ADLスコア(13)	11.1 $\pm$ 2.7	8.0 $\pm$ 3.7	<0.0001
うつスコア(0~15)	3.7 $\pm$ 2.7	12.1 $\pm$ 1.6	<0.0001
QOL			
主観的健康度	65.5 $\pm$ 18.7	44.3 $\pm$ 19.6	<0.0001
主観的気分	71.8 $\pm$ 18.3	41.6 $\pm$ 20.4	<0.0001
家族関係	82.8 $\pm$ 17.5	58.4 $\pm$ 26.7	<0.0001
友人関係	80.4 $\pm$ 18.2	57.0 $\pm$ 25.1	<0.0001
主観的経済状態	64.8 $\pm$ 24.8	37.7 $\pm$ 25.2	<0.0001
(申告月額収入(万円))	15.0 $\pm$ 16.4	12.9 $\pm$ 17.2	ns
生活満足度	75.0 $\pm$ 20.4	40.4 $\pm$ 24.8	<0.0001
主観的幸福度	75.3 $\pm$ 18.1	42.4 $\pm$ 21.1	<0.0001

Illness や Disease が「正常ならざるもの」, 「善からぬ状態」, 「異状」として社会化された概念ともいえそうだ。Disease を解き明かそうとする近代医学の論理は, 客観性, 再現性, 普遍性といった, いわゆる科学的根拠に基づいた優れた利点はある。うつ病に脳内セロトニンが関与するという発見は, 近年の抗うつ薬の開発に大きな地平を開いた。しかし, Disease の概念のみでは, 個人のそれぞれに異なる症状, 価値観に応じた要請には十分に答えられないという冷徹な欠点をもまた併せもっている。うつ診断基準は, Illness, Sickness の立場を鮮明にしている。

### 本邦の高齢者における抑うつ傾向とADL, QOL

われわれは, 本邦の各地域における地域在住高齢者を対象に, 老年医学的総合機能評価(CGA)とその介入を実施してきた。CGAには, 医学的な疾病診断以外に, 日常生活機能(ADL)評価, 社会的背景の把握, 抑うつスクリーニン

グ, 定量的な主観的 Quality of Life(QOL)評価などが含まれる。抑うつ傾向の評価には, Geriatric Depression Scale(GDS)などのスクリーニング法を用い, 定量的なQOL評価には Visual Analogue Scale を用いて, 主観的健康度, 家族関係, 友人関係, 経済満足度, 主観的幸福感などを評価した。表1は, 京都府S町在住の65歳以上の高齢者において, 15項目GDSを用いて, 10点未満の「抑うつなし」群と10点以上の「抑うつあり」群で, ADL, QOLを比較したものである。10点以上の「抑うつあり」群は地域高齢者の約1割に認められ, 「抑うつなし」群に比して有意に年齢が高いが, 年齢の影響を統計学的に調整した後にも, すべてのADL項目, すべてのQOL項目について, 有意にスコアの低下が認められた。地域在住高齢者における「抑うつあり」群が「抑うつなし」群に比して, すべてのADL, QOLが低下している事実は, 本邦の各地域に共通してみられる普遍的な現象であった<sup>3)</sup>。したがって, スクリーニング法で「抑うつあり」と疑われた場合は, 精神科医や心療内科医との連携のもとに介入に

表2 うつ傾向があるか否か(GDS $\geq$ 6)によるADLならびにQOLの比較(ベトナム・プートー地域)

	抑うつ傾向なし (GDS $\leq$ 5) (n=321)	抑うつ傾向あり (GDS $\geq$ 6) (n=66)	p
年齢	70.9 $\pm$ 8.6	70.8 $\pm$ 8.0	ns
性別(男性/女性)	151/163	20/45	0.0111
ADLs			
基本的ADLスコア(21)	20.1 $\pm$ 1.9	19.5 $\pm$ 2.5	0.0322
手段的ADLスコア(5)	3.9 $\pm$ 1.6	3.4 $\pm$ 1.7	0.0357
知的ADLスコア(4)	2.8 $\pm$ 1.6	2.3 $\pm$ 1.7	0.0236
社会的ADLスコア(4)	3.7 $\pm$ 0.8	3.2 $\pm$ 1.2	0.0004
総合的高次ADLスコア(13)	10.3 $\pm$ 3.5	8.9 $\pm$ 4.0	0.0057
QOL (range, 0~100)			
主観的健康度	49.1 $\pm$ 17.6	38.0 $\pm$ 18.0	<0.0001
家族関係	78.9 $\pm$ 15.6	63.3 $\pm$ 24.4	<0.0001
友人関係	79.3 $\pm$ 16.1	73.3 $\pm$ 18.8	0.0089
経済満足度	52.8 $\pm$ 14.4	44.0 $\pm$ 15.2	<0.0001
主観的幸福度	61.9 $\pm$ 16.5	47.1 $\pm$ 19.4	<0.0001

表3 アジアの諸地域におけるGDSスクリーニングと精神科医診断におけるうつの頻度(文献10より改変引用)

	日本U町 (n=728)	韓国洪川 (n=329)	ベトナム・ プートー (n=387)	ラオス・サバ ナケット (n=294)	ミャンマー・ マウビン (n=336)	タイ・ コンケン (n=407)	p
年齢	74.4 $\pm$ 7.1	72.3 $\pm$ 6.1	70.8 $\pm$ 8.1	69.6 $\pm$ 7.6	70.3 $\pm$ 7.0	68.4 $\pm$ 6.7	<0.0001
性別(男性/女性)	325/403	180/149	175/212	121/173	175/161	265/141	<0.0001
Geriatric Depression Scale(GDS : 0~15)	4.4 $\pm$ 3.2	5.4 $\pm$ 4.2	3.4 $\pm$ 2.7	5.5 $\pm$ 2.8	3.7 $\pm$ 3.1	4.1 $\pm$ 3.1	<0.0001
% of GDS $\geq$ 6	42	40	17	36	23	27	<0.0001
% of GDS $\geq$ 10	8	20.5	7.6	6.5	7.6	9	<0.0001
DSM-IVに基づく精神科医の診断に よるうつの頻度	9.0	9.6	7.2	7.8	6.7	6.2	<0.0001

入ることが重要である。

### アジア諸国の高齢者における 抑うつ傾向とADL, QOL

筆者らは、本邦と同様のCGAを用いて、アジア5カ国(韓国、ベトナム、ラオス、ミャンマー、タイ)の農村に住む高齢者の健診を実施してきた。表2は、ベトナム・プートー地域において、15項目GDSを用いて、5点以下の「抑うつ傾向なし」群と6点以上の「抑うつ傾向あり」群で、ADL, QOLを比較したものである。両群に年齢の差は認められなかったが、

6点以上の「抑うつ傾向あり」群は「抑うつ傾向なし」群に比して、本邦と同様にすべてのADL項目、すべてのQOL項目について有意にスコアの低下を示していた<sup>9)</sup>。この現象は、アジアの5カ国でも同様の普遍性を示した。表3は、アジアの5カ国と日本のU町において、抑うつスクリーニングであるGDS $\geq$ 6点、GDS $\geq$ 10点の割合と、精神科医がDSM-IVの診断基準に基づいて、うつありと診断した割合を示したものである。本邦を含めたアジアの地域在住高齢者では、GDS $\geq$ 6点の高齢者が17~42%、GDS $\geq$ 10点の高齢者は6.5~20.5%と地域差を認めたが、精神科医による構造的面接での診断

では、6.2~9.6%に分布した<sup>10)</sup>。

抑うつ発症の素因に遺伝的背景が存在することは間違いないであろうが、有病の割合が、地域の文化や社会背景によって異なる多様性を示すのか、また時代の変化による増減があるのか、などについてはサンプリングの困難性や診断精度の問題もあって、まだまとまった研究が少なく、一概に論じこめることは難しい。しかし、スクリーニング法を用いても、また、精神科医の構造的面接による診断においても、地域在住高齢者の中の少なくとも1割弱には抑うつが認められ、しかもADL、QOLと関連している事実は重要である。

### おわりに

高齢者の抑うつは、明らかにADL、QOLと関連する。抑うつの病態が、生物学的疾病か、あるいは社会背景と密接に関連した幅広い人間の心理的スペクトラムの揺らぎであるのかについては、まだなお今後の研究の蓄積が必要であろう。しかし少なくとも、薬物的あるいはカウンセリングを通じて治療可能な医療の現状を考えれば、抑うつが精神医学のみならず老年医学にとっても最重要な課題であることは間違いない。

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## ORIGINAL ARTICLE

# Association between brachial–ankle pulse wave velocity and 3-year mortality in community-dwelling older adults

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With aging, arterial stiffness increases and results in cardiovascular diseases. Recently, high brachial–ankle pulse wave velocity (baPWV), measured using a new noninvasive device to estimate arterial stiffness, was reported to be associated with the prevalence of cardiovascular diseases. The purpose of this study was to clarify the association between baPWV with 3-year mortality in community-dwelling older adults and to determine the cutoff value of baPWV in terms of mortality. A total of 530 subjects aged 65 years or older (men/women, 207:323; mean age, 76 years) participated. They were dichotomized by the median value of baPWV. Within 3 years, 30 deaths occurred, including 11 cardiovascular deaths. The high-baPWV group had a higher incidence of total deaths (high-baPWV group vs. low-baPWV group, 8.3 vs. 3.0%, respectively) and cardiovascular deaths (high-baPWV group vs. low-baPWV group, 3.8 vs. 0.4%, respectively). A high-baPWV level was associated with an increased risk of 3-year total mortality after adjustment for age, sex and systolic blood pressure (hazard ratio for high baPWV vs. low baPWV=2.98, 95% CI=1.25–7.07) and with an increased risk of 3-year cardiovascular mortality (hazard ratio for high baPWV vs. low baPWV=10.01, 95% CI=1.21–82.49). A receiver-operating characteristic curve showed that the optimal cutoff value of baPWV for total mortality was 19.63 m s<sup>-1</sup>, and for cardiovascular mortality it was 19.63 m s<sup>-1</sup>. This study provides a preliminary finding that assessment of arterial stiffness by baPWV might be a useful method to predict mortality risk in community-dwelling older adults. Large longitudinal studies for extended periods of time are necessary to confirm the association.

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**Keywords:** arterial stiffness; mortality; older adults; pulse wave velocity

## INTRODUCTION

Arterial stiffness increases with advancing age and is known to lead to cardiovascular disease (CVD).<sup>1</sup> It is important to assess arterial stiffness in older adults because CVDs, such as stroke and heart disease, are the major causes of death in these individuals. Pulse wave velocity (PWV) is known to be an indicator of arterial stiffness.<sup>2</sup> Aortic PWV, as assessed by determining carotid–femoral PWV (cfPWV), has been reported to be associated with an increased risk of total or cardiovascular mortality in clinical populations, such as patients with end-stage renal disease,<sup>3</sup> hypertension<sup>4,5</sup> or diabetes<sup>6</sup> as well as in the general population.<sup>7–10</sup> Of the previous studies, only one examined this association in community-dwelling older adults.<sup>7</sup>

Brachial–ankle PWV (baPWV) can be measured with a simple and noninvasive device that estimates arterial stiffness. Cross-sectional studies have reported an association between high baPWV and prevalence of cardiovascular risk factors,<sup>11,12</sup> presence of coronary artery disease in male patients,<sup>13</sup> presence of cerebrovascular disease in

asymptomatic community-dwelling older persons<sup>14</sup> and in hypertensive patients aged 50 years or older.<sup>15</sup> However, there have been few longitudinal reports about the relationship between baPWV and mortality.<sup>16–18</sup> One study suggested that increases in baPWV were associated with an elevated risk of cardiovascular mortality in 298 community-dwelling older adults, but the optimal cutoff value of baPWV was not shown.<sup>17</sup>

The purpose of this study was to evaluate the relationship between baPWV and 3-year mortality and to determine the optimal cutoff value of baPWV in terms of mortality among community-dwelling older adults.

## METHODS

### Study population

All subjects were registered in the Kahoku longitudinal study, which was designed to prolong healthy life expectancy by providing health screening, counseling and educational services to older persons living in Kahoku, a rural town in Japan.<sup>19,20</sup> In this community of 5596 residents, 2092 (37.4%) were

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