なお，本尺度は，面接調査で用いることができるだけでなく，自記式質問票の形式でも用いることも可能である．

筆者らは，国際的に比較が可能な介護負担尺度の日本語版を作成することが有用であると考え，Zarit教授の許可を得て，Zarit介護負担尺度日本語版（J-ZBI）を作成し，信頼性と妥当性を確認した[9]．表1に，全22項目の質問とその判定基準を示したが，原版と同じく満点は88点であり，介護負担が全くない場合は0点である．この介護負担尺度は，介護者の負担を客観的に把握する目的で，わが国の多くの大学，研究所等で用いられている．

Schreinerと筆者らは，家族介護者に抑うつ症状がみられるか否かについて，J-ZBI得点の24点をそのカットオフポイントとしたが，今後，より大規模な地域調査で確認する必要があると考えている[10]．

2. Zarit介護負担尺度日本語版の短縮版（J-ZBI_8）

1）J-ZBI_8および2つの下位尺度についての信頼性・妥当性の確認

筆者らは，実際の介護の現場で，より簡便に介護負担を測定できるようJ-ZBI短縮版(J-ZBI_8)を作成した．短縮版作成にあたっては，在宅介護者に対し介護負担（J-ZBI）に関する調査を行い，項目22を除いた21項目に対し因子分析を行い，短縮版の項目の選定を行った．その結果，personal strain（介護を必要とする状況（または事態）に対する否定的な感情の程度），role strain（介護によって（介護者の）社会生活に支障を来たしている程度），それぞれ5項目，3項目からなる，J-ZBI短縮版（J-ZBI_8）が作成された．表1の◎を付した5項目がpersonal strainに該当する項目であり，△を付した3項目がrole strainに該当する項目である．J-ZBI_8，下位尺度personal strain，role strainそれぞれにおいて，信頼性・妥当性が確認された[11,12]．従って，J-ZBIの短縮版であるJ-ZBI_8の信頼性，妥当性は原版と同様高いものであり，充分に実用に耐えうるものと確認された[11,12]．

2）J-ZBI_8の交差妥当性の確認

さらに，別地域において介護負担調査を行い，J-ZBI_8の交差妥当性（作成時と異なる対象における妥当性：尺度が他の地域でも使えるかどうか）を確認し，J-ZBI_8が全国どの地域でも用いることができることが明らかになった[13]．

J-ZBI_8は，わずか8項目の簡便な尺度であるが，因子構造が明確な2つの下位尺度を持ち，J-ZBIと極めて高い相関が認められた．本尺度により，簡便に在宅介護者の介護負担を把握することが可能となる．このようにJ-ZBI_8は，在宅介護，臨床の現場，諸調査において，介護負担を客観的に測定する上で極めて有用な尺度であり，幅広い利用が望まれる．

3. 介護負担に関してこれまでに行われた研究

介護負担に関してこれまで行われた研究から得られた知見を以下に記す．なお，諸外国の介護負担研究では，「介護者が要介護者と同居しているか否か」についての報告・検討がなされていないものも存在する．これに対し，高齢者と子供との同居率が高いわが国では，同居の家族介護者を対象とした介護負担研究が大半を占めており，諸外国の研究結果との比較を行う際には，この点に留意することが必要である．

1）要介護者側の要因と介護負担との関連

要介護者の日常生活動作能力（activities of daily living：ADL）の自立の程度と，介護負担との関連については，有意な関連を認めた研究と認めなかった研究とがあり，一致した見解はみられていない．また要介護者の痴呆の重症度，認知機能と介護負担についても，関連を認めないとする報告が多いが，必ずしも一致した結果は得

られていない．さらに，われわれの研究では，痴呆の重症度が同じ場合，Alzheimer型痴呆と脳血管性痴呆患者を介護する者の介護負担の程度には違いがみられないことが明らかになった[14]．

これに対し，要介護者，特に痴呆患者の精神症状・行動異常（behavioral and psychological symptoms of dementia：BPSD，以下BPSDと略す）については，ほぼすべての先行研究において，介護負担との関連が強く認められており，筆者らの行った研究でも同様の知見が得られた[15]．

また，前頭側頭葉性痴呆（FTLD）患者は，人格変化や脱抑制などの行動変化を伴うことが多いため[16]，こうした患者の家族介護者は，介護をしていく上で，特異的な問題を抱えていることが明らかになっている[17]．

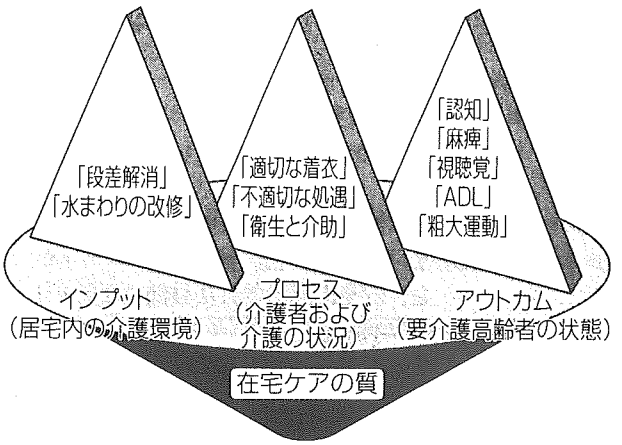
2）介護者側の要因と介護負担との関連

一方，介護者に関する変数としては，介護者の性，年齢，続柄それぞれと介護負担との関連については一致した見解はみられていない．また，介護期間に関しては，これまでのところ，その期間の長さと介護負担との間に，明らかな関係は見出されていない．これに対し，介護量の指標として広く用いられている介護時間は，介護負担と有意に関連することが知られている．

ところで，要介護者（特に，Alzheimer型痴呆患者）を介護する者にとっては，実際に介護をする時間だけでなく，見守りに時間をとられることが多い．これを踏まえて，われわれは，介護者に対して，「患者から目を離せない時間（あるいは，その逆としての介護者が外出できる時間）」を尋ねるようにしている．その結果，介護者の外出時間と介護負担との間には有意な関連が認められた[18]．

3）家族の介護負担に関する縦断研究

次に，介護負担の経時的変化に関してこれまでに行われた縦断研究（longitudinal studies）の知見を以下に記す．Haleyらによると，介護負担の経時的変化には，細分すると3つの型が考えられるという[19]．第1は，介護をしていくうちに，



図．HCQAIの尺度構成

要介護者（介護される側）の心身の状態が悪化するため，介護者の介護負担が高くなるとする説である（wear-and-tear model）．第2は，介護者が介護に慣れていくため，介護負担は軽くなるとする説である（adaptation model）．第3は，個人（介護者）に備わっているコーピングの能力は一定しているため，介護負担は常に変わらないとする説である（trait model）．これまでに行われた研究では，上記3つのそれぞれの説を支持するような報告がなされている．

ところで，わが国においては，2000年に介護保険制度が導入されたが，介護保険制度導入前から要介護高齢者の介護を続けている介護者の介護負担が，制度導入前後において，どのように変化するのかを検討すべく，某自治体において縦断研究を行ったところ，悪化してはいないことが示された[20]．

4）介護負担得点と他のアウトカム指標との関連——虐待，入所，ケアの質との関連

在宅生活から施設へ入所した要介護者の介護者（配偶者）は，在宅生活を続けていた要介護者の介護者に比して，介護負担が有意に高かったことが報告されている[21,22]．また，要介護高齢者に対して不適切な処遇（いわゆる虐待）を行ったことがある介護者は，介護負担が高いことが報告されている[23,24]．

表2. 在宅ケア質の評価法：Home Care Quality Assessment Index（HCQAI）項目例

A. 段差の解消
（1）床の凹凸や段差
2. 無い，少ない（バリアフリー）1. 一般的な段差 0. 介護上問題となる大きな段差
（2）玄関
2. 安全に配慮された設備（改修）1. 一般的な設備 0. 問題がある
（3）廊下などの床面（段差など）
2. 安全に配慮された設備（改修）1. 一般的な設備 0. 問題がある

C. 不適切な処遇
（1）要介護者は家族や介護者を恐れていないか
2. 全く恐れていない
1. 恐れている可能性が推測される（要介護者の話などから）
0. 家族や介護者がいると怯える
0. 覚醒しない・無反応
（2）身体的拘束（縛る等）
1. 受けていない 0. 受けている
（3）居室への閉じ込め（外から施錠し居室から出さない等．家族もいる家屋全体の施錠は含めず）
1. 閉じ込められていない 0. 閉じ込められている

ところで，家族介護者の介護負担が高い場合に，その家族が行っている在宅ケアの質に対して，どのような影響を及ぼすのかについては明らかになっていない．それ以前の問題として，在宅ケアの質を客観的に評価する方法はこれまでに存在しなかった．筆者らは，(1) 要介護高齢者の状態（アウトカム），(2) 家族介護者および介護の状況（プロセス），(3) 居宅内の介護環境（インプット）の3領域から在宅ケアを総合的に評価する方法として，Home Care Quality Assessment Index：HCQAIを開発した[25]．医療やケアの質を評価するにあたっては，Donabedianが提唱したインプット（施設基準など），プロセス（実施状況など），アウトカム（状態の改善など）の三点から評価する方法が，広く用いられている[26]．われわれの開発した評価法も，Donabedianが提唱した評価の枠組みに準拠するものであり，居宅ケアを総合的に評価することが可能な指標である．

図に示したように，HCQAIは10の尺度から構成されている．これら10の尺度のうち，インプット（居宅内の介護環境）に相当するものとして，「段差解消」尺度と「水まわりの改修」尺度の2つが該当し，プロセス（介護者および介護の状況）に相当するものとして，「適切な着衣」尺度，「不適切な処遇」尺度，「衛生と介助」尺度の3つの尺度が該当し，アウトカム（要介護高齢者の状態）に該当するものとしては，「認知」尺度，「麻痺」尺度，「視聴覚」尺度，「ADL」尺度，「粗大運動」尺度の5つの尺度が該当した．表2には，インプット（居宅内の介護環境）の尺度の1つである「段差解消」尺度の項目例と，プロセス（介護者および介護の状況）の尺度の1つである「不適切な処遇」尺度の項目例を示した．

4. 介護負担軽減に向けて

これまでの先行研究の結果から，介護負担軽減のためには，患者のBPSDを軽減し，介護者が介護に要する時間を減らし自由になれる時間を確保することが必要であると考えられる．前者の，BPSDの軽減にあたっては，患者自身への介入策としての薬物療法（あるいは非薬物療法）が有効であるだけでなく，介護者への教育をはじめとした介護者に対する介入も有効であるといわれている[27]．後者の，家族介護者が介護に要す

る時間を減らす手段としては，介護を代わってくれる者あるいは手伝ってくれる者がいること(informal instrumental supportがあること)があげられる[28]．また，デイサービス，ショートステイをはじめとした居宅介護サービスを有効利用することで，介護時間を減らすこともできるであろう．

居宅介護サービス利用に関連して，われわれが介護保険制度導入後に行った研究からは，サービスの利便性が良い場合，家族介護者の負担は軽い傾向にあることが明らかになった[18]．しかしながら，現行の介護保険制度のもとで提供されている居宅介護サービスは，数カ月前からの予約が必要なものが多いため，緊急時における患者および介護者のニーズに対応することは難しい．また，現行の居宅介護サービスは，介護上，最も負担となる痴呆患者のBPSDに対応したものとは言い難い．今後，痴呆（認知症）患者の家族介護者の負担を軽減していくためには，BPSDに対応できるような居宅介護サービスを開発・提供し，さらに家族介護者が利用したい時に利用できるような（利便性の高い）サービスの整備に努めていくことが必要であろう．

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ANGST IN SHANGRI-LA: JAPANESE FEAR OF GROWING OLD

To the Editor: The proportion of Japanese people aged 65 and older reached 19.0% of the total population in 2003.[1] This is due to the longest life expectancy for men (78.4) and women (85.3), but also the longest *healthy* life expectancy in the world—72.3 for men and 77.7 for women.[2] Japan also has the lowest fertility rate in the world (1.32) next to Italy.[1] This fast-graying nation will soon face an unprecedented situation in which one in four will be an elderly person.[3] Japan's long-term care insurance system was established in 2000 precisely to manage this fast-graying population.[3] How does it feel personally to be among people promised the longest healthy life in the world?

To find out how Japanese people in general feel about aging, a survey was conducted in September 2004, asking the following three subjective questions.

1. Would you like to live long?
2. Do you worry about getting old?
3. What in particular makes you worry about growing old?

Survey participants were selected from a panel organized by the Social Survey Research Information Co. Ltd. in Japan. The panel consisted of 52,478 persons among the general population aged 20 and older. Some 2,224 people were selected using a quota sampling method.[4] The sample consisted of 444 adults aged 20 to 39, 546 adults aged 40 to 54, 563 adults aged 55 to 64, 532 adults aged 65 to 74, and 139 adults aged 75 and older. Each subject received a self-administered questionnaire; 2,031 returned the questionnaire, and the data from 2,025 participants were analyzed.

The survey revealed that 59% of the general public in Japan hoped to live long. Of those who answered that they did not wish to live long, neither age nor sex was associated with a "wish not to live long" (chi-square (χ^2) = 6.822, degrees of freedom (df) = 4, P = .15) (Figure 1). Eighty-three percent of the sample answered that they worry about getting old. Again, neither their age nor sex was associated with their apprehensions in this regard (χ^2 = 4.236, df = 4, P = .38) (Figure 1). The 1,680 "worried" subjects were then asked about what in particular made them worry about growing old. Specifically, they were asked whether any of the following eight issues caused them concern: becoming ill, becoming bedridden or demented, losing steady income apart from a pension, becoming widowed, spouse or partner becoming ill or bedridden, deteriorating relationship(s) with family members or becoming less close, having to change their way of living, and deteriorating relationship(s) with friends or becoming less close.

Examination of the reasons revealed three key concerns about becoming old. Seventy-eight percent answered that becoming bedridden or demented frightened them about growing old, 72% that becoming ill made them worry about growing old, and 68% that being left without a steady income other than a pension was a basis of their concern about growing old.

The present survey has revealed seemingly paradoxical results obtained from the general public in a country

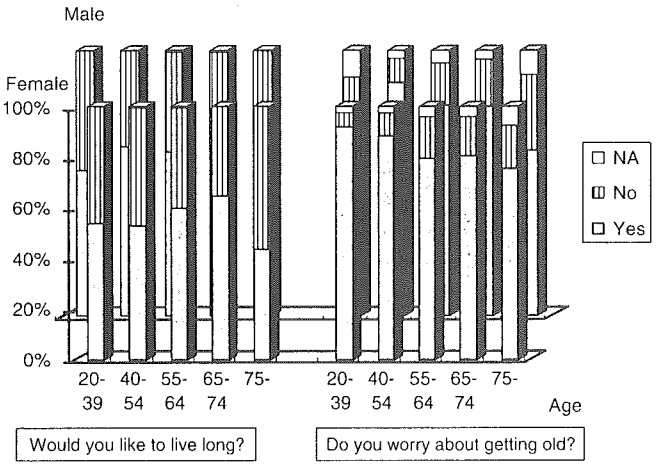

Figure 1. Two main concerns regarding growing old in questionnaire survey.

boasting the longest healthy life expectancy in the world. In fact, the Japanese surveyed in this study showed considerable apprehension about growing old that appeared out of proportion to the long and healthy lives that most can anticipate. These overly pessimistic attitudes may limit the possibilities for successful aging and need to be addressed. First, there needs to be dissemination among the general population of more factual information about aging, stressing that the Japanese are the world's healthiest and longest-living people in the world. The media has only heightened the fear of becoming "impaired." Only a small proportion of the population, not more than 16% of the elderly Japanese aged 65 and older, need care at all.

Second, although the general public must be given a far more realistic view of growing old as Japanese, the existing social system should also be improved so that people will be reassured that a safety net is in place when they become ill, impaired, or short of money in later life.

Third, there needs to be attention paid to the possibilities for successful aging. The survey results may reflect the Alzheimerization of aging; all the publicity given to dementia has raised worries among the entire population. These worries must be balanced with views of successful aging and with prevention programs that could ensure good mental and physical health and perhaps even forestall the development of dementia.[5]

Yumiko Arai, MD, PhD
Keigo Kumamoto, PhD
Department of Gerontological Policy
National Center for Geriatrics and Gerontology
Aichi, Japan

Steven H. Zarit, PhD
Department of Human Development and Family Studies
Pennsylvania State University
University Park, PA

Hitoshi Dennoh, BSc
Masakazu Kitamoto, BA
Social Survey Research Information Co. Ltd
Tokyo, Japan

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Regular Article

Feelings of burden and health-related quality of life among family caregivers looking after the impaired elderly

HIROKO MIURA, MPH, PhD,[1] YUMIKO ARAI, MD, PhD[2] AND KIYOKO YAMASAKI, MSc[3]

[1]*Faculty of Health Science, Kyushu University of Health and Welfare, Miyazaki,* [2]*Research Unit for Nursing Caring Sciences and Psychology, National Institute for Longevity Science, Aichi,* [3]*Faculty of Social Welfare, Kyushu University of Health and Welfare, Miyazaki, Japan*

Abstract The aim of the present study was to examine the relationship between feelings of burden and health-related quality of life (HRQOL) among family caregivers looking after the impaired elderly residing in a community located in southern Japan. Subjects were 85 pairs comprising elderly individuals requiring care and their respective family caregivers. Questionnaire items for the family caregivers related to demographic variables, caregivers' burden, HRQOL, use of public services, hours spent caregiving, duration of caregiving, and satisfaction with verbal communication with family. Questionnaire items for the elderly recipients of care concerned demographic variables, activities of daily living, and cognitive status. According to bivariate analysis, caregivers' burden was significantly related to cognitive status, hours spent caregiving, and each HRQOL subscore except physical function. From multiple regression analysis, subscore of HRQOL with respect to mental health and satisfaction with verbal communication were extracted as influential factors. Final regression coefficient was 0.72 ($P < 0.01$) and coefficient of determination was 0.53. These results suggest that satisfactory mental health status plays an important role in limiting family caregivers' burden.

Key words burden, caregivers, HRQOL, impaired elderly, Japan, verbal communication.

INTRODUCTION

In Japan, a rapid increase in the elderly population has resulted in an unprecedented rise in the number of elderly requiring social assistance. As a result of the new public long-term care insurance scheme, many impaired elderly individuals with long-term and complex health problems are being cared for by family caregivers.[1]

Some investigators have reported that the mental or emotional strain associated with caregiver status is an independent risk factor for mortality among elderly spousal caregivers.[2] Furthermore, several studies have documented a strong relationship between caregiving and elevated levels of depressive symptoms among caregivers, including high rates of clinical depression and anxiety.[3,4] Thus, in order to maintain the health status of family caregivers, it is very important to elucidate the physical and/or mental influences on the family caregiver that occur during long-term caregiving.

Studies on perceived caregivers' burden have identified certain factors to be associated with feelings of burden.[5–7] However, few studies have examined the direct association between perceived burden and health-related quality of life (HRQOL) including physical and mental health among family caregivers. The present study therefore aimed to analyze the relationship between feelings of burden and HRQOL among family caregivers using various scales.

Correspondence address: Dr Hiroko Miura, Department of Speech Therapy, Faculty of Health Science, 1714-1 Yoshino-cho, Nobeoka-shi, Miyazaki 882-8508, Japan.
Email: hmiura@phoenix.ac.jp

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METHODS

Subjects

The survey was conducted from October 2003 to January 2004 in Nobeoka City, Miyazaki Prefecture, southern Japan, using a self-administered questionnaire. As the first step, we randomly selected 115 impaired elderly individuals (36 men, 79 women) who were above 65 years of age, resided in the community with their family, and received a public welfare service under the national long-term care insurance system. In the second step, all 115 impaired elderly and their family principal caregivers were contacted by mail to explain the objectives of the present study. Informed consent was obtained from 85 pairs (response rate = 73.9%). Differences between participants and non-participants of the study, in terms of age, sex, and physical or mental status, were not statistically significant. All family caregivers who decided not to participate in the present study cited lack of time in their schedules as their reason. This study was endorsed by the ethical committee of Kyushu University of Health and Welfare.

Measurements

Family caregivers were asked to complete a questionnaire regarding the following areas related to perceived burden and caregiving: (i) demographic variables; (ii) caregivers' burden; (iii) HRQOL; (iv) use of public services; (v) hours spent caregiving per day; (vi) duration of caregiving; and (vii) satisfaction with verbal communication with family. Caregivers' burden was evaluated using the short version of Japanese version of the Zarit Caregiver Burden Interview (J-ZBI_8), which has been demonstrated to have similar validity to the full version, the J-ZBI.[8,9] HRQOL among family caregivers was evaluated using the Japanese version of the short-form 36 health survey questionnaire (SF-36).[10,11] The SF-36 is widely used to assess QOL including health status and comprises eight health subscales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Regarding use of welfare services, respondents were asked about their use of the following six types of available services within the previous month: home-help, home nurse visits, respite care, meals on wheels, bathing service, and residential day care. Levels of satisfaction with verbal communication with family members were measured by the question: 'Are you satisfied with your ability to communicate with the family verbally?' in accordance with our previous survey.[12] Subjects categorized themselves as either 'satisfied' or 'dissatisfied' in this respect.

For the impaired elderly subjects, questionnaire items were grouped into the following aspects: (i) demographic variables; (ii) activities of daily living (ADL); and (iii) cognitive status. Impairment and disability were evaluated using the ADL-20.[13] This scale consists of 20 items from four major categories of basic activities of daily living (ADL): (i) mobility, five items; (ii) self-care, six items (iii) instrumental ADL (IADL), seven items, and (iv) communication ADL (CADL), two items. It has been reported that ADL-20 is useful as a comprehensive measure of ADL in the elderly with a variety of handicaps. Cognitive impairment was rated using the revised Hasegawa Dementia Rating scale (HDS-R), a Japanese screening test for dementia that measures overall cognitive function, including verbal orientation and memory, with scores ranging from 0 to 30. The HDS-R is equivalent to the Mini-Mental State Examination and has been widely used in Japan.[14]

Analyses

Bivariate analyses were performed using Spearman's rank correlation coefficients, unpaired *t*-tests, Welch test, and ANOVA. Then, a stepwise multiple regression analysis was performed with the J-ZBI_8 score treated as the dependent variable for each independent variable ($F = 3.0$) in order to detect the factors with the largest influence on burden among family caregivers. All statistical analyses were performed using SPSS version 12.0 (Chicago, IL, USA).

RESULTS

Tables 1 and 2 show the characteristics of the impaired elderly and their family caregivers. For the impaired elderly, mean age was 80.81 ± 7.62 and mean HDS-R score was 14.54, indicating that most of the elderly participants suffered from cognitive impairment. For caregivers, mean age was 64.33 ± 12.92. Average number of welfare services used was 2.15, with all caregivers reporting to having used at least one service. Only around 55% of caregivers reported being satisfied with verbal communication with the family.

Table 3 shows correlation coefficients between J-ZBI_8 score and certain variables including ADL capability of the impaired elderly, and caregiving-related factors and SF-36 subscores among the family caregivers. Caregivers' burden was correlated with HDS-R score of the impaired elderly ($P < 0.05$) and with the following SF-36 subscores: RP ($P < 0.05$), RE ($P < 0.01$), SF ($P < 0.01$), MH ($P < 0.01$), BP ($P < 0.05$),

Table 1. Characteristics of impaired elderly individuals and their caregivers ($n = 85$)

Variable	Mean	SD
Impaired elderly		
Age	80.81	7.62
ADL-20 score	38.17	16.55
HDS-R score	14.54	8.24
Caregiver		
Age	64.33	12.92
J-ZBI_8 score	12.85	7.23
Hours spent caregiving (h/day)	6.24	5.75
Duration of caregiving (years)	5.69	6.22
Short-form 36 health survey questionnaire		
Physical functioning	70.35	29.48
Role physical	58.54	43.52
Role emotional	56.91	45.49
Social functioning	71.65	22.88
Mental health	60.80	21.26
Bodily pain	54.12	22.65
Vitality	52.60	24.77
General health	50.15	20.93
No. public services used	2.15	1.20

Table 2. Characteristics of the impaired elderly and caregivers ($n = 85$)

Variable	Number	%
Impaired elderly		
Gender		
Male	27	31.76
Female	58	68.24
Caregiver		
Gender		
Male	19	22.35
Female	66	77.65
Relationship to the elderly person		
Spouse	25	29.41
Child	29	34.11
Daughter-in-law	20	23.53
Others	11	12.94
Verbal communication		
Satisfied	47	55.29
Dissatisfied	38	44.71

VT ($P < 0.01$), and GH ($P < 0.01$). However, J-ZBI_8 score demonstrated no significant correlation to age of the impaired elderly, age of their caregivers, hours spent caregiving, duration of caregiving, PF subscore of SF-36, or the number of welfare services used.

Table 4 shows the relationship between J-ZBI_8 and certain variables including gender of the impaired eld-

Table 3. Spearman rank correlation coefficients between caregiver burden (J-ZBI_8 score) and various independent variables

Independent variable	Coefficient	*P*-value
Impaired elderly		
Age	0.08	0.44
ADL-20 score	–0.05	0.67
HDS-R score	–0.29	0.01
Caregiver		
Age	–0.17	0.10
Hours spent caregiving (h/day)	0.23	0.05
Duration of caregiving (years)	–0.09	0.41
SF-36		
Physical functioning	0.06	0.56
Role physical	–0.21	0.04
Role emotional	–0.41	0.00
Social functioning	–0.53	0.00
Mental health	–0.56	0.00
Bodily pain	–0.24	0.02
Vitality	–0.51	0.00
General health	–0.36	0.00
No. public services used	0.17	0.09

Table 4. Relationship between caregivers' burden evaluated by J-ZBI_8 and the following variables: gender of impaired elderly person and their caregiver, caregiver's relationship to the impaired elderly, and satisfaction with verbal communication

Variable	J-ZBI_8 (mean ± SD)	*P*-value
Impaired elderly		
Gender		
Male ($n = 27$)	12.04 ±8.36	0.33†
Female ($n = 58$)	10.22 ±6.73	
Caregiver		
Gender		
Male ($n = 19$)	9.52 ±5.84	0.48‡
Female ($n = 66$)	10.79 ±7.61	
Relationship to the elderly person		
Spouse ($n = 25$)	10.58 ±8.16	0.120§
Child ($n = 29$)	11.45 ±6.09	
Daughter-in-law ($n = 20$)	8.33 ±5.59	
Others ($n = 11$)	13.90 ±8.90	
Verbal communication		
Satisfied ($n = 47$)	13.66 ±7.85	<0.01†
Dissatisfied ($n = 38$)	8.37 ±5.73	

†Calculated by Welch test.
‡Calculated by unpaired *t*-test.
§Calculated by ANOVA.

Table 5. Factors related to caregivers' burden on stepwise multiple regression analysis

Variable	Beta	*t*	*P*-value
SF-36 MH	−0.58	−5.32	<0.01
Self-rated verbal communication	−0.03	−2.89	<0.01

Multiple correlation coefficient (R) = 0.72; coefficient of determination (R^2) = 0.53.

erly individual and their caregiver, family relationship between the pair, and caregivers' satisfaction with verbal communication. Satisfaction with verbal communication was significantly related to caregivers' burden ($P < 0.01$). However, no significant relationship was demonstrated between J-ZBI_8 score and gender of the impaired elderly person or caregiver, or family relationship between the pair.

Table 5 shows the results of a stepwise multiple regression analysis conducted to find the most influential factor on caregivers' burden. MH subscore of SF-36 was extracted in the first step, and satisfaction with verbal communication was extracted in the second step. Final regression coefficient was 0.72 ($P < 0.01$), and coefficient of determination was 0.53.

DISCUSSION

These results indicated a close association between feelings of burden and HRQOL in family caregivers looking after the impaired elderly. In particular, the results of multiple regression analysis showed that quality of life associated with mental health was significantly related to feelings of burden in caregivers. Moreover, the results of bivariate analysis and multiple regression analysis indicated that physical health of caregivers was weakly associated with caregivers' burden. Furthermore, satisfaction with verbal communication with the family was also related to feelings of burden among the caregivers. These two factors accounted for nearly 53% of the variance of J-ZBI_8 scores that indicated caregiver burden. In our previous study conducted among healthy elderly individuals, a close relationship was detected among satisfaction with verbal communication, general health status, and social activity.[12] Hence, satisfactory verbal communication plays an important role in maintaining relationships with other family members, and reduced opportunities for verbal communication sometimes lead to increased feelings of burden in family caregivers. In addition, previous studies have indicated a stronger relationship between caregiving and depression, stress, and social interaction than between caregiving and physical health outcome.[7,15] Taken together with the results of the present study, these findings suggest that caregivers' burden has little significant association to physical health.

Some studies have reported that the caregivers of dementia patients can exhibit severe psychological problems,[16,17] a finding that is supported by the present results. On examining the relationship between caregiver burden and attributes of the impaired elderly including ADL and cognitive function, bivariate analysis indicated that cognitive status of the impaired elderly as evaluated by HDS-R was significantly related to family caregiver burden. However, multiple stepwise regression analysis indicated no significant relationship between these two variables. Previous studies have also detected no significant relationship between caregiver burden and cognitive status.[4,5]

Type of disease (such as stroke and Alzheimer's disease) has been found to affect the association between elderly individuals' ADL and their caregivers' burden.[18,19] The present results indicated no significant relationship between ADL of the impaired elderly and caregivers' burden. However, subjects in the present study had a variety of diseases, and it was therefore difficult to control for type and severity of illness. From these findings, it is therefore impossible to elucidate the relationship between ADL of the impaired elderly and the burden experienced by family caregivers.

Neither the family relationship between the elderly person and the caregiver nor caregiver age had a significant influence on caregiver burden. While bivariate analysis indicated that caregivers' gender was significantly related to the burden, multiple regression analysis did not show such a significant relationship. It has previously been reported that caring for a first-degree relative can strongly affect burden and stress among family caregivers.[4,20,21] However, this was not supported by the present findings. Our previous studies have demonstrated that the notion of caregiving as a family duty strongly remains in northern rural areas of Japan.[4,5] However, concepts of caregiving differ greatly according to local customs and in the future it will be necessary to repeat this survey in a variety of regions.

The present study has several methodological limitations. First, sample size was relatively small and little detailed information regarding disease history was gathered. Nevertheless, the present results suggest that family caregivers experiencing high burden have significantly lower mental health and satisfaction with verbal communication. This might be attributable to the objective demands of caregiving causing symptoms of depression and decreasing both the energy available for engaging in verbal communication and the oppor-

tunities to do so. Second, as the study design was cross-sectional, we cannot rule out a bidirectional relationship between family caregivers' burden and mental health and satisfaction with verbal communication. While the present findings provide important basic information, longitudinal studies are needed to obtain stronger scientific evidence, and to evaluate causality between family caregivers' burden and QOL in the future.

Maintaining QOL of family caregivers is essential in order to preserve the quality and sustainability of home care. A decline of mental health and satisfaction with verbal communication is likely to result in increased caregivers' burden. Conversely, improving these factors would lead to a reduction in caregiver burden. In addition to the public service system, informal services also play an important role in improving mental health and satisfaction with verbal communication among caregivers. We advocate that, in future, family caregivers receive counseling by trained professionals.

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Original article

Relationship between general health status and the change in chewing ability: a longitudinal study of the frail elderly in Japan over a 3-year period

Hiroko Miura[1], **Makoto Kariyasu**[1], **Kiyoko Yamasaki**[2], **Yumiko Arai**[3] and **Yasunori Sumi**[4]

[1]Department of Speech Therapy, Faculty of Health and Welfare, Kyushu University of Health and Welfare, Miyazaki, Japan; [2]Department of Welfare Administration and Management, Faculty of Social Welfare, Kyushu University of Health and Welfare, Miyazaki, Japan; [3]Department of Health Policy for the Aged, National Institute for Longevity Science, Aichi, Japan; [4]Division of Dental Surgery, The National Chubu Hospital, Aichi, Japan

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Relationship between general health status and the change in chewing ability: a longitudinal study of the frail elderly in Japan over a 3-year period

Objectives: The aim of the present study was to identify the onset predictors of a change in chewing ability over a 3-year period in the frail elderly.
Methods: The subjects were frail elderly people living in southern Japan. Data were collected at baseline ($n = 92$) and 3 years later ($n = 60$). The dependent variable was a change in self-rated chewing ability. The independent variables were age, gender, number of present teeth, dentition, maximum bite force (evaluated using a pressure-sensitive foil), basic activities of daily living, self-rated general health status, higher level of competence (evaluated using Tokyo Metropolitan Institute of Gerontology index), cognitive status (evaluated by revised Hasegawa Dementia Rating scale), and quality of life (evaluated using Philadelphia Geriatric Center morale scale) at baseline. To identify the most reliable predictors, bivariate analysis and multiple logistic regression analysis were performed, with the change of chewing ability as the dependent variable.
Results: Bivariate analysis showed the change in chewing ability was significantly associated with general health status ($p < 0.01$), number of present teeth ($p < 0.05$) and maximum bite force ($p < 0.01$). Backward logistic regression analysis revealed that the most reliable predictor of a change in chewing ability at 3 years was general health status (odds ratio = 6.35, 95% CI = 1.69–23.88).
Conclusion: The present findings suggest that general health status at baseline produces a change in chewing ability.

Keywords: chewing ability, longitudinal study, the frail elderly, general health status.

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Introduction

Oral status and function are closely related to chewing and speaking ability. For the elderly, mastication plays a particularly important role in eating and diet. Results of some epidemiological studies suggest that oral health is related to physical, mental and social health[1,2]. In particular, it has been reported that chewing ability influences nutrition status, overall health, and activities of daily living (ADL) in the elderly[3–7]. Impairment of masticatory function and chewing disability may result from tooth loss, asthenia of masticatory muscles, or reduced saliva secretion[8]. Thus, clinicians should be aware of not only the chewing problems of the elderly, but also the possible interaction between oral health and overall health status.

Some cross-sectional studies have shown that a decline in chewing ability frequently occurs in the elderly, and that most of the impaired elderly develop dental problems as a result of tooth loss[9,10]. These studies have provided very important epidemiological information, but longitudinal studies

are required to provide more detailed information about the association between chewing ability and general health. Recent longitudinal studies, based on data from relatively large samples of community-dwelling elderly in Western countries, indicate that there are interrelations among oral impairment, oral functional limitations, and general functional limitations[11,12]. In these studies, subjects were randomly selected from the population of the study area, and the subjects thus included different types of elderly people, including healthy, frail and impaired elderly. However, the relationship between general health and a change in chewing ability among frail elderly people in Japan is unclear. Frail elderly people often exhibit incipient decline in higher levels of competence, even if they retain the ability to perform basic activities of daily living (BADL).

The elderly population of Japan is increasing rapidly and the Ministry of Health, Labour, and Welfare estimates that they will soon comprise almost 28% of the total Japanese population. They also estimate that approximately 3 million elderly Japanese people have physical or mental disabilities, and predict that this number will rise to 5.3 million by 2025[13]. Frail and impaired elderly people often have serious dental problems including chewing disability. Thus, it is very important to examine epidemiological data about chewing ability of this group.

The purpose of the present study was to examine the relationship between general health status of frail elderly people and a change in chewing ability using data obtained in a longitudinal survey over a 3-year period, as well as identifying any onset predictors of a change in chewing ability.

Methods

Subjects

The baseline survey was conducted in 2000 in Nobeoka City, Miyazaki Prefecture, in southern Japan. Of the 100 frail elderly people who were initially enrolled in the study, a total of 92 (25 males, 67 females; age range, ≥65 years) completed the baseline survey, giving a response rate of 92%. All subjects were residents in a nursing home for the frail elderly, and were able to perform BADL independently at baseline. These included walking, eating, evacuation functions, bathing and dressing. However, many of the subjects exhibited decreased cognitive function and decreased ability to independently perform instrumental activities of daily living (IADL).

Three years after the baseline survey, 60 subjects (17 males, 43 females) completed the second survey. Thirty-two subjects (8 males, 24 females) were unable to complete the second survey because they had died or had changed their place of residence. Both surveys were approved by the ethics committee of Kyushu University of Health and Welfare.

Measures/variables

Chewing ability was evaluated using a self-administered questionnaire according to the method described previously[14,15]. Subjects reported whether they were satisfied or dissatisfied with their chewing ability at baseline and 3 years later. A change in chewing ability after 3 years was classified into the following four groups: improved (baseline: dissatisfied, 3 years later: satisfied), sustained good (baseline: satisfied, 3 years later: satisfied), sustained poor (baseline: dissatisfied, 3 years later: dissatisfied), and degenerated (baseline: satisfied, 3 years later: dissatisfied). With respect to a change in chewing ability, improved and sustained good subjects were scored as '1' while sustained poor and degenerated subjects were scored as '0' for the dependent variable. Based on previous studies[5,15], data describing self-rated general health were collected using a self-administered questionnaire, with responses classified into four categories ('excellent', 'good', 'fair' and 'poor'). Demographical variables included age and gender, and were collected using a self-administered questionnaire.

The number of teeth for each subject was determined by a clinician. Maximum bite force (N) was evaluated using the Prescale System[16], which is a pressure-sensitive foil (50H type) exhibiting a colour variation depending on the force of applied occlusal pressure within a range of 5–120 MPa. All subjects occluded on to the Prescale foil in centric position for 10 s with maximum force[17].

The Tokyo Metropolitan Institute of Gerontology (TMIG) index, which consists of 13 items, was used to evaluate higher levels of competence, including IADL, intellectual activity and social role[18]. The TMIG index is widely used in Japan. For each item, subjects were assigned '1' for a positive answer, and '0' for a negative answer. Thus, the total score of the TMIG index ranged from 0 to 13 points.

Cognitive impairment was rated using the revised Hasegawa Dementia Rating scale (HDS-R), a Japanese screening test for dementia. This measures overall cognitive function, including verbal orientation and memory, with scores ranging from 0 to 30[19]. The HDS-R is equivalent to the

Mini-Mental State Examination, and has been widely used in Japan[19]. Subjects with ≥21 points on the HDS-R are classified as normal and subjects with <21 points are classified as having dementia.

Quality of life (QOL) was evaluated using the Philadelphia Geriatric Center (PGC) morale scale. The revised PGC morale scale consists of 17 items that are divided into three fields: agitation, attitude towards ageing, and loneliness/dissatisfaction[20]. For each item, subjects were assigned '1' for a positive answer and '0' for a negative answer, the total PGC morale scale score ranging from 0 to 17 points.

Statistical analysis

A two-part statistical analysis was conducted in order to determine predictive baseline variables for a change in chewing ability as a dependent variable. Bivariate analysis was performed to identify baseline variables associated with a change in chewing ability (improved or sustained good: score '1', sustained poor or degenerated: score '0'). Then, chi-square and relative risk tests were used to analyse any association between these baseline variables and a change in chewing ability. Each relative risk demonstrated an increased risk of reduced chewing ability among exposed elderly compared to unexposed elderly. All relative risks were presented with 95% confidence intervals (CI). An unpaired *t*-test was also used to examine any differences of these scores with respect to self-rated changes in chewing ability over the 3-year study period.

Secondly, we conducted a logistic regression analysis to determine the predictors of any change in self-rated chewing ability as a dependent variable at baseline. Considering all independent variables that exhibited significant associations with a change in self-rated chewing ability in the above bivariate analysis, backward likelihood ratio logistic regression analysis was also performed with a change in self-rated chewing ability as the dependent variable. All statistical procedures were performed using the SPSS version 12 statistical software package (Chicago, IL, USA).

Results

Table 1 shows the subject characteristics at baseline and 3 years later. The mean age of baseline subjects was 80.52 ± 8.59 years. Three years later, the

Table 1 Subject characteristics at baseline ($n = 92$) and 3 years after baseline ($n = 60$).

Characteristics	*Baseline ($n = 92$) (%)*	*Three years after baseline ($n = 60$) (%)*	χ^2 *Value*	*p-Value*[a]
Gender				
Male	25 (27.2)	17 (28.3)	<0.01	0.98
Female	67 (72.8)	43 (71.7)		
Self-rated chewing ability				
Satisfied	63 (68.5)	46 (76.7)	0.83	0.36
Dissatisfied	29 (31.5)	14 (23.3)		
Dental status				
Edentulous	47 (51.1)	27 (45.0)	0.32	0.57
Dentate	45 (48.9)	33 (55.0)		
Self-rated general health				
Excellent/good	50 (54.3)	38 (63.3)	0.86	0.35
Fair/poor	42 (45.7)	22 (36.7)		
Cognitive status				
Normal	27 (29.3)	18 (30.0)	<0.01	0.92
Dementia	65 (70.7)	42 (70.0)		
			T-Value	*p-Value*[b]
Age	80.52 ± 8.59	80.67 ± 7.98	−0.65	0.24
TMIG index	5.47 ± 3.72	4.60 ± 3.17	1.84	0.07
PGC morale scale	9.82 ± 3.08	10.60 ± 3.52	−1.62	0.11
Number of present teeth	5.65 ± 6.87	4.33 ± 5.54	3.28	<0.01
Maximum bite force (N)	317.53 ± 292.54	183.50 ± 176.30	4.09	<0.01

TMIG, Tokyo Metropolitan Institute of Gerontology; PGC, Philadelphia Geriatric Center.
[a]Chi-square test.
[b]Unpaired *t*-test.

Table 2 Relative risk at baseline for change in chewing ability after 3 years. Dental status, self-rated general health, and cognitive status as independent variables ($n = 60$).

	% With onset	*p-Value*	*Relative risk (95% CI)*
Baseline variable			
Dental status			
Edentulous	38.3	0.21	0.36 (0.09–1.44)
Dentate	61.7		
Self-rated general health			
Excellent/good	61.7	0.01	6.35 (1.69–23.88)
Fair/poor	38.3		
Cognitive status			
Normal	36.7	0.75	0.66 (0.18–2.43)
Dementia	63.3		

mean age was 80.67 ± 7.98 years. The only significant changes in data, compared with baseline, were for the number of teeth and maximum bite force ($p < 0.01$). At baseline, all subjects were able to independently perform BADL. However, 15% of subjects showed a decline in BADL after 3 years.

Tables 2 and 3 show the relationship, determined by bivariate analysis, between a change in chewing ability after 3 years and independent variables at baseline. In Table 2, relative risk was used to characterise the relationship between each variable at baseline and a change in chewing ability after 3 years. Self-rated general health was significantly associated with a change in chewing ability, with a relative rate of 6.35 (95% CI = 1.69–23.88; $p < 0.01$). However, dental status and cognitive status were not significantly associated with a change in chewing ability (Table 2).

In Table 3, an unpaired *t*-test was performed to characterise the relationship between each variable and a change in chewing ability. The number of teeth and maximum bite force were found to be significantly associated with a change in chewing ability ($p < 0.01$). However, IADL and QOL (evaluated using the TMIG index and PGC morale scale) were not significantly associated with a change in chewing ability (Table 3).

Table 4 shows the results of multiple logistic regression analysis, which was used to identify the most reliable predictors of a change in chewing ability. The logistic regression model was refined until it included one independent variable, the self-rated general health. The odds ratio for self-rated general health was 6.35 (95% CI = 1.69–23.88), and beta was 1.85 (SE = 0.68). The chi-square test of the present model was 8.35 ($p < 0.01$).

Discussion

The present results indicate that a change in self-rated chewing ability after 3 years is strongly related to the self-rated general health at baseline, using bivariate and multivariate analysis. Many studies have shown close associations between a self-rated chewing ability and objectively evaluated

Table 3 Change in chewing ability in relation to baseline scores of Tokyo Metropolitan Institute of Gerontology (TMIG) index, Philadelphia Geriatric Center (PGC) morale scale, number of teeth, and maximum bite force in subjects who completed surveys at both baseline and 3 years later ($n = 60$).

	Change in chewing ability			
	Improved/sustained good	*Degenerated/sustained poor*	*T-Value*	*p-Value*
Baseline variable				
TMIG index	5.47 ± 3.78	4.60 ± 3.17	1.84	0.07
PGC moral scale	9.82 ± 3.08	10.59 ± 3.52	−1.62	0.11
Number of present teeth	5.65 ± 6.88	4.33 ± 5.54	3.28	0.01
Maximum bite force (N)	317.53 ± 292.54	183.50 ± 176.30	4.09	0.00

Table 4 Logistic regression analysis with factors related to change in chewing ability[a] after 3 years as a dependent variable.

Independent variable	*Beta estimate*	*Odds ratio*	*95% CI*	*Wald χ^2*	*p-Value*
Self-rated general health	1.85	6.35	1.69–23.88	7.47	0.006

[a]Goodness of fit for this model: chi-square = 8.35, $p < 0.01$.

status and function of dental structures[21,22]. However, it is very interesting that, in the present study, the self-rated general health was a factor most closely associated with a change in chewing ability. Compared with cross-sectional studies, a longitudinal study has greater power to detect real effects[23,24]. The present longitudinal results strongly support the findings of previous cross-sectional studies. These have shown a significant relationship between overall physical health and masticatory status in the elderly.

Maximum bite force is an effective subjective indicator for the evaluation of masticatory function. However, it is difficult to examine chewing ability using a single method because normal mastication involves many structures and functions. The self-rated evaluation used in the present study is not subjective, but is very effective for the comprehensive evaluation of chewing ability in frail elderly subjects with declining IADL and cognitive status. In the present bivariate analysis, maximum bite force was found to be significantly associated with a change in chewing ability. Nevertheless, maximum bite force at baseline was not found to be a reliable predictor of a change in chewing ability.

On the contrary, in the present study, cognitive status and QOL were not related to a change in self-rated chewing ability. Some studies have shown a significant relationship between cognitive status and masticatory function in the elderly using a cross-sectional approach[25,26]. Also, some similar studies have shown that the masticatory status is significantly associated with the QOL of elderly people[4,27], with most residing in a rural community. Thus, the majority of the subjects were not frail or impaired elderly. In the present study, the subjects were all frail elderly, and many of them had a low cognitive and morale status at baseline. Differences between the present findings and those of previous cross-sectional studies may be due to the mental and social characteristics of the study population.

The association between decline in chewing ability and poor general health has not been fully elucidated. However, adequate chewing ability plays an important role in a healthy diet[6]and nutrition in the elderly is closely related to their physical health. Therefore, it could be suggested that difficulty in maintaining a healthy diet because of deteriorating chewing ability could cause the deterioration of overall health. Locker[28] proposed a model with a general pathway from disease via oral impairments (e.g. edentulism) and oral functional limitation (e.g. chewing problems) through to disability (e.g. inability to consume a range of foods) and the impacts on social roles. The model suggests that limited oral function leads to a decline in the physical, mental, and social activities of the elderly. Findings of the present bivariate and logistic regression analyses indicated that the strongest predictor of a change in chewing ability was self-rated general health, not variables related to oral health, such as the number of teeth present or edentulism.

Subjects who rate their health as poor are likely to have more chronic medical diseases, experienced more severe limitations in ADL, and may also have a risk of developing dry mouth as a result of increased medication use. Dry mouth is indirectly related to masticatory and/or swallowing function[10], but, in the present study, detailed information with respect to dry mouth was not examined. Further limitations of the present study include the relatively small sample size and short observation period, with the former being the greatest problem. Thus, future studies should examine the status of dry mouth, and more precisely evaluate the associations between chewing ability, QOL and cognitive function in the frail elderly by recruiting larger samples and maintaining longer observation periods. Nevertheless, the present results suggest that maintaining a good general health status contributes to the maintenance of chewing ability. Previous related research has indicated a strong relationship between general health and chewing ability[1,4,5,9]. Other recent epidemiological studies also indicate that chewing disability may be associated with a greater risk of mortality and a decline in physical fitness among community-dwelling elderly[29,30].

The present findings suggest that general health status may be one of the most powerful predictors of a change in chewing ability. All the present subjects were able to independently perform BADL at baseline; but 15% showed rapid decline in BADL after 3 years. As decline in BADL can strongly influence oral functioning, all geriatric assessments should include an oral examination and an assessment of disability and impairment of oral health.

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Correspondence to:
Hiroko Miura,
Department of Speech Therapy,
Faculty of Health Science,
Kyushu University of Health and Welfare,
1714-1 Yoshino-cho, Nobeoka-shi,
Miyazaki 882-8508, Japan.
E-mail: hmiura@phoenix.ac.jp

〈原　著〉

在宅要介護高齢者ならびにその家族介護者における主観的言語コミュニケーション満足度の関連要因

三浦　宏子[1)]　荒井由美子[2)]　山崎きよ子[3)]

〈要　約〉　在宅要介護高齢者とその家族介護者85組を対象として，要介護高齢者とその介護者間の言語コミュニケーション満足度の一致度と調べるとともに，それぞれの言語コミュニケーション満足度に影響を及ぼす関連要因について解析を行った．介護者に対しては自記式質問紙による留置調査を実施し，その基本属性，言語コミュニケーション満足度，介護負担感，1日あたりの介護時間，1日あたりの自由時間，介護期間，介護サービスの利用状況などについて調べた．一方，要介護高齢者に対しては，デイサービス利用時に聞き取り調査を行い，その基本属性，言語コミュニケーション満足度，痴呆の程度，日常生活機能，意思伝達機能，情報理解能，摂食・嚥下機能などについて調べた．その結果，言語コミュニケーション満足者の割合は，要介護高齢者で82.4%，介護者で55.3%であった．両者の統計的一致度はκ値＝0.17と低かった．2変量解析の結果，要介護高齢者の言語コミュニケーション満足度と有意な関連性を示した項目は，日常生活機能（$p<0.01$），情報理解能（$p<0.05$），ならびに嚥下機能（$p<0.05$）であり，いずれも要介護高齢者自身の身体的機能に関するものであった．一方，介護者の言語コミュニケーション満足度は，要介護高齢者の性別（$p<0.05$）ならびに介護者の介護負担感（$p<0.01$）と有意な関連性を示した．次に多重ロジスティック回帰分析を行ったところ，要介護高齢者の言語コミュニケーション満足度と有意な関連性を示した項目は情報理解能であり（p値＝0.032，オッズ比＝2.960），介護者の言語コミュニケーション満足度と有意な関連性を示した項目は介護負担感であった（p値＝0.004，オッズ比＝0.842）．これらの結果より，要介護高齢者と介護者の言語コミュニケーション満足度の一致性は低く，その関連要因も大きく異なることが示唆された．

Key words：要介護高齢者，言語コミュニケーション，介護者，介護負担感

（日老医誌　2005；42：328—334）

緒　言

現在，介護保険サービスを受給している要介護高齢者の数は269万人にも昇り，そのうちの約7割を在宅サービスが占めている[1)]．この数は，今後さらに増加することが予測されており，在宅介護の質のさらなる向上が求められている[2)]．円滑に質の高い在宅介護を行うためには，介護保険に代表される公的サービスの拡充だけでなく，要介護高齢者とその家族介護者との間に良好なコミュニケーションが確立されていることが，重要な条件となる．コミュニケーションには，大別して言語コミュニケーションと非言語コミュニケーションの2つがあるが，特に言語コミュニケーション能力は，要介護高齢者が自分の現状や希望を，介護者や医療従事者などの他者に伝達するだけではなく，人間関係の構築のうえでも極めて重要な役割を果たす[3)~5)]．しかし，要介護高齢者とその家族介護者の言語コミュニケーションに関する調査研究は少なく，両者間の言語コミュニケーション状態の詳細は十分に明らかになっていない．

要介護高齢者の介護は長期間にわたる例が多く，要介護高齢者と家庭内の介護者との間の言語コミュニケーションが不足している場合では，介護者の介護負担感の増加をきたすことが予想される．しかし，要介護老人ならびにその介護者間の言語コミュニケーションと介護者の介護負担感との直接的な関連性を調べた先行研究はほとんどなく，その詳細は不明である．在宅介護の質の向上のためにも，要介護者のみならず介護者の言語コミュニケーションに関わる要因を明らかにすることは意義あるものと考えられる．

言語コミュニケーションは神経系，感覚系，運動系の器官や機能が複雑に関与して営まれるものであるため，

1) H. Miura：九州保健福祉大学保健科学部言語聴覚療法学科
2) Y. Arai：国立長寿研究センター研究所　長寿政策科学研究部
3) K. Yamasaki：九州保健福祉大学社会福祉学部福祉環境マネジメント学科
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その状態の総合評価が難しいという側面がある[6]．そこで，まず要介護高齢者ならびに介護者のそれぞれに対して，自身の言語コミュニケーションに対する満足度について主観的に自己評価をしてもらい，その結果を用いて，言語コミュニケーションに関係する要因分析を行った．本研究では，要介護高齢者とその主たる介護者の言語コミュニケーション満足度との間に一致性が認められるのか，また介護者の介護負担感と言語コミュニケーション能力ならびに満足度との間に関連性が見られるのかの2点を明らかにすることを目的に，2変量解析と多変量解析を行った．

対象および方法

1．調査対象

宮崎県延岡市内に居住している高齢者で家族と同居し，平成15年10月1日の時点で要介護認定を受けている者のうち，デイサービスを利用している要介護高齢者とその主たる家族介護者の両者から調査に同意が得られた115組に調査をお願いした．調査の実施にあたっては，調査実施前に本学の倫理委員会において承認を得た後に，予定対象者のために説明会を開催し，要介護高齢者とその家族介護者，ならびにデイサービスセンターの管理者と担当者に，調査内容を説明した．上記の115組のうち，有効回答が得られた85組の要介護高齢者とその介護者を，実際の解析対象者とした（有効回答率＝73.9%）．なお，本調査は，平成15年10月より平成16年1月に実施した．

2．調査項目ならびに調査方法

本研究は，断面調査の方法を用いて行った．上述した家族介護者には，自記式質問紙を配布し，約1週間後に回収する留置調査を実施し，その基本属性，主観的言語コミュニケーション満足度，介護負担感，1日あたりの介護時間，1日あたりの自由時間，今までの介護期間などについて調べた．一方，要介護高齢者に対しては，デイサービス利用時にインタビュアーが聞き取り調査を行い，その基本属性，主観的言語コミュニケーション満足度，痴呆の程度，摂食・嚥下機能，日常生活機能，意思伝達機能，情報理解能などについて調べた．

1）主観的言語コミュニケーション満足度

本研究では，我々が従来から用いている主観的方法[4]を用いて，言語コミュニケーション満足度に関する評価を行った．すなわち，要介護高齢者とその家族介護者の両者に対して，「あなたは，自分のご家族との日常会話に満足していますか」という同じ質問を設定し，「はい」，「いいえ」の2段階で回答を求めた．

2）介護負担感

介護負担感の評価指標としては様々なものが考案されているが，本研究では，荒井らが作成したZarit介護負担尺度日本語短縮版（J-ZBI_8）[7]を用いて評価を行った．この評価指標は，以前より広く使用されてきたZarit介護負担尺度日本語版（J-ZBI）を簡便化したものであり，このスケールを用いて0～32点で評価した．

3）摂食・嚥下機能の評価

摂食・嚥下機能の評価は，我々が従来から用いている摂食・嚥下障害ケアアセスメント法の本人評価表の18項目の質問事項[8]を用いた．18項目それぞれについて，「よくある」，「時々ある」，「まったくない」の3段階で評価し，各回答項目について2点，1点，0点を与えてスコア化し，0～36点で摂食・嚥下障害の程度を判定した．すなわち，摂食・嚥下機能にまったく問題がない場合は0点を割り付け，摂食・嚥下障害のスコア値（嚥下スコア）の上昇は，摂食・嚥下障害のリスク要因の増加を示すものとした．

4）日常生活機能（ADL）ならびにコミュニケーション機能の評価

本研究では，コミュニケーション能力を含めて，広くADLを評価することができるADL-20[9]を用いて，要介護高齢者のADLを0～60点で評価した．また，ADL-20の下位階層であるコミュニケーションADL（CADL）評価項目を用いて，対象者の意思伝達機能と情報理解機能についても調べた．

5）痴呆の評価

痴呆の程度については，改訂長谷川式簡易知能評価スケール（HDS-R）[10]を用いて0～30点で評価した．

3．統計解析

言語コミュニケーション満足度に関しての要介護高齢者とその介護者の回答の一致性については，Kappa（κ）統計量[11]を用いて解析を行った．また，主観的言語コミュニケーション満足群と不満足群の2群間の比較には，t検定とWelch検定を用いた．さらに，交絡要因の影響を取り除いたうえで，要介護高齢者と家族介護者における各々の言語コミュニケーション満足度の関連要因を調べるために，多重ロジスティック回帰分析を行った．独立変数は，要介護高齢者自身の年齢ならびに性別，嚥下スコア，HDS-Rスコア，ADL-20スコア，意思伝達能スコア，情報伝達能スコア，介護者の年齢ならびに性別，1日あたりの介護時間，1日あたりの自由時間，今までの介護期間，利用している介護サービス数とした．なお，これらの一連の統計解析には，SPSS　Ver.12（エス・ピー・エス・エス・ジャパン社，東京）を用いた．