

<ul style="list-style-type: none"> ・ほとんど職場では教えてもらえず、自分で調べるか月間デイより情報得ている。 ・経口摂取加算など、自分と違う施設区分制度
<p>【現場での指示系統】</p> <ul style="list-style-type: none"> ・リハ→看護→介護など ・統括する人がいない。各部署のトップに上げて許可を取ると恐ろしく時間がかかり、必要な時に介入できない。 ・分からないスタッフ、理解しようとしめないスタッフは、それで良いという流れがある（むしろ提案した方が煙たがられる）。 ・指導を病棟内で統一しようとしても困難であり、1人1人の意識の差が見られる。
<p>【連携相手】</p> <ul style="list-style-type: none"> ・アクションの早い介護士とゆっくりな介護士がいる。 ・当院では歯科医は常勤しているわけではないので、なかなか連携が取りづらい。 ・耳鼻科医は“興味がない”、歯科医はいない。 ・介護職・看護職への連携
<p>【患者・家族】</p> <ul style="list-style-type: none"> ・家族の方がなかなか来られない方、独居の方、相談が出来ずに方向性が決められない方が多い。 ・家族様の理解、ニーズが高い場合や、患者・家族の意見の相違があり、老々介護状態が多く、理解が得られにくい（自分で精一杯、遠方で手助けができないなど）。 ・安全を考えている事が伝わらない事も多い。 ・嚥下能力が低下している方にどんどん差し入れを食べさせており、病態理解が乏しい方への説明
<p>【ケア等の実務】</p> <ul style="list-style-type: none"> ・急性期病棟ではケアや検査の時間でリハビリの時間の確保がなかなか難しい。 ・口腔ケアを嫌がる方への対応（唾液腺マッサージ以外に口を閉じたままでいいものか）。 ・スタッフ業務を優先したケアが行われる事が多いので、患者様のことを考え、自分であればどうされたいか考えてほしい。

⑤また研修を受ける機会があればどういうことを学びたいか

<ul style="list-style-type: none"> ・認知症の疾患や症状に応じての対応の仕方や注意点など ・在宅や訪問でのアセスメント・嚥下機能は良くても、認知症が邪魔をして食べにくくなっている方への対応の仕方と簡単な見分け方、介護職へ注意点を伝える際のコツ
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D. 考察

i) 管理栄養士

管理栄養士について、専門的な食事形態や食事内容に関することは自信を持って行えているが、皮脂厚計や下腿浮腫の判断など身体接触が必要な身体計測⁶⁾については、感染対策の観点から困難を感じていた。また感染対策以外でも、認知症の人に対する対応方法や口腔ケア、嚥下機能評価に関しても必要性の認識・協力する意欲はあるものの、養成課程で学習の機会がないものに関しては知識不足から不安を感じていた。さらに連携をすべき他の職種に対しては、相談のタイミングなど連絡手段、コミュニケーションの方法、専門的な情報交換の伝達方法、相談相手が定まっていないことから、連携のしにくさを感じていた。特に専門的な情報を介護士や介護支援専門員、家族と共有し理解を得るための方法について困難を感じつつも、情報共有に向けて試行錯誤している様子が伺えた。対策として「言葉遣い」「御礼」「笑顔」「報告・連絡・相談」にくわえ「記録」に注意し、連携相手に対する謙虚な姿勢を挙げていた。また実務上で利用者（患者）家族と接する機会が少なく希望聴取が困難であること、慢性疾患を抱えた状態の要介護高齢者の摂食嚥下機能などを家族に説明し理解を得たうえで対応を検討する一連の流れに課題を感じていた。

ii) 歯科衛生士

歯科衛生士については、口腔衛生のみならず咀嚼や食事姿勢、利用者（患者）の覚醒の支援も自信をもって行うことが出来るものがある一方で、食事観察の際の大人数で観察すると圧迫感を与えるために日常の様子が観察できない事への悩みを抱えていた。また薬剤の作用や精神疾患の知識、吸引等の技能につ

いて習熟の不足を感じていた。また連携に関しては、現場の専門職と事務職、チームリーダーである医師、との意思疎通の困難さを感じ、チームづくり、情報共有のための共通言語の必要性を感じていた。医療・介護現場の電子システム（電子カルテ等）での情報共有の困難さを指摘しているものも複数で、実務上の連携のためには「実演」し「写真などを用いて方法を共有化するための紙」「ラウンドのための対象者一覧表」を作る、「専門用語使わず」説明するなどの工夫を行っていた。他の職種を尊重し、話しかける際に丁寧に前置きするなど、口腔衛生や口腔機能の支援を行う専門的な情報を共有するために人間関係を取り持つ配慮を行っていた。一方で職域による指示系統の混乱や煩雑さ、家族に対する支援も行いたい反面で医療・介護施設などで直接家族とコミュニケーションが困難なケースの課題が挙げられた。多職種協働の方法や専門的な情報の共有化、施設全体への伝達に課題意識を持っていた。

iii) 看護師

看護師においては、医療情報の説明やアセスメントに加え、複数の職種での話し合いによる検討、連携の繋ぎ役、目標設定とそれに向けた支援が得意分野であり、アセスメントから医師・歯科医師への提案、協力し合えるチーム作りにも意欲的に取り組む姿勢がある点は非常に興味深い。看護師養成課程における、専門職連携教育の取り組みが先進的に勧められている分野としての強みが反映されているものと考えられる。医療と介護の連携が必要である要介護高齢者の経口摂取支援においては、誤嚥症例の対応や吸引など困難症例には看護師が対応することも多いものと考えられるが、不安を感じながら実施しているこ

とが伺えた。また複数の職種との連携を重視する観点から、非常勤である職種との効率的な連携や、他の職種との腰を据えた話し合い、知識の伝達の必要性を感じていながらも、連携によって症例ごとの一時的な対応が功を奏しても他の症例にうまくつながらない、などジレンマを抱えている様子が伺えた。一方で、職種間で認識がずれている、問題意識が共有できないというコメントは他の職種とも同様の意見であった。そういった課題に対する対応としては連携相手に「自ら実践してみせる」「分かりやすく」「感謝を言葉で」「一緒に」「参加」「共有」など、連携相手の意欲を引き出す工夫を行っていた。看護師としての特性から、安全面を重視しつつも利用者(患者)の「楽しみ」「喜び」といったQOLを支えることの課題も挙げられた。

iv) 介護士

介護士においては、特に「生活」「生活史」「好み」「背景」「患者ペース」「食べる意欲」「理解」といった、利用者(患者)の生活全体を支える視点が浮き彫りになった。こう言った視点から、他の職種と温度差がある・意見が合わない、認知症の人の理解がない他の職種の対応に不安、などの意見があり、一方で連携すべき職種が不在の時の誤嚥症例・窒息症例にも不安を感じていた。医療の専門職との連携方法について、互いのバックグラウンドの違いがある中でも、分かりやすく報告、簡潔に伝達、指示を忘れないようにする、相手を尊重する伝え方などを重視し、最も重要な対象者である利用者(患者)の好みや介入によって得られた効果などの情報を積極的にフィードバックする配慮などを行っていた。介護現場での医学的な決定に対しては、利用者(患者)の幸せかどうか、生活の

困難の改善に結びつくかどうか、残存機能を活かしているか、要介護高齢者の自立の促進と安全や栄養摂取量のどちらを重視すべきか、などに悩みを抱えていた。さらに介護職の中でも人材教育についても課題意識が伺われた。

v) リハビリテーション職種(言語聴覚士、理学療法士、作業療法士)

リハビリテーション職種について、今回の検討では言語聴覚士、理学療法士、作業療法士を同一集団とした。利用者の課題に気付くが、他の職種との情報の共有やコミュニケーション方法、課題意識の共有を図るまでの知識の伝達に課題を感じていた。タイミングを外さない介入、複数の職種間での統一した介入に困難を感じ、またそういった困難に対し「こまめなコミュニケーション」「積極的に」「一緒に」「(指示ではなく)相談するように伝える」「常駐する」「専門用語は使わず」「紙面にして」など、人間関係を取り持つ配慮と専門的な知識の伝達を受け入れられるための工夫を行っていた。養成課程で習熟しなかった知識について、課題意識をもって自ら取り入れる努力もみられた。また介護施設などでは他の医療職とも互いに非常勤であることが少なくなく、直接顔を合わせる機会は貴重であり連携の取りづらさを困難に挙げていた。他の職種同様、医学的な説明の理解が困難である家族に理解を得る伝達方法も課題として挙げられた。

E. 結論

医療・介護の専門職を対象とした、要介護高齢者の経口摂取支援方法に関する研修会の参加者126名に対する記述式アンケートによって、多職種連携の課題や工夫について検討を行った。

要介護高齢者の経口摂取支援には複数の職種が専門性をあわせ協働して支援することが必要である。しかしながら養成課程での学習機会の相違点、または職種としての方向性の違いから意見が咬み合わないケースも多く経験する。本検討によって、それぞれの課題意識のありどころ、連携を行うために配慮している点の違いと共通点が浮き彫りになった。本検討はさらに対象者数を増やして質的な検討を行い、効果的な多職種連携に資する検討を行う必要がある。

F. 健康危険情報
なし

G. 研究発表
なし

H. 知的財産権の出願・登録状況
なし

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III. 研究成果の刊行に関する一覧表

研究成果の刊行に関する一覧表

書籍

著者氏名	論文タイトル名	書籍全体の編集者名	書籍名	出版社名	出版地	出版年	ページ
渡邊 裕	神経疾患	(編) 一般社団法人日本老年歯科医学会	老年歯科医学	医歯薬出版	東京	2015	419-429
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枝広あや子	5.精神疾患と口腔ケアQuestion53.認知症の人に口腔ケアを行う際に、アルツハイマー病、血管性認知症、レビー小体型認知症では、対応や方法に配慮すべき点はありますか？	藤本篤士, 武井典子, 東森秀年, 糸田昌隆, 大野友久, 永田俊彦	続5疾病の口腔ケア	医歯薬出版	東京	2016	188-191

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Morishita S, <u>Watanabe Y</u> , Ohara Y, <u>Edahiro A</u> , Sato E, Suga T, Hirano H	Factors associated with the need of older adults for oral hygiene management by dental professionals.	Geriatr Gerontol Int.	Epub ahead of print		2015
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枝広あや子, 平野浩彦	ワンポイント講座 認知症高齢者への口腔ケアと食支援(Vol.17) 認知症高齢者の安全な食への配慮	コミュニティケア	18(1)	34-35	2016
平野浩彦	【不安を受け入れてうまくいく トラブルをよばない認知症患者さんへの対応】	歯科衛生士	40(1)	54-65	2016
枝広あや子, 平野浩彦	ワンポイント講座 認知症高齢者への口腔ケアと食支援(Vol.18) 認知症高齢者が食べやすい食への配慮	コミュニティケア	18(2)	36-37	2016
枝広あや子, 平野浩彦	ワンポイント講座 認知症高齢者への口腔ケアと食支援(Vol.19)<最終回> 認知症高齢者の食べたくない心理要因への配慮	コミュニティケア	18(3)	36-37	2016
平野浩彦	認知症の人への歯科的対応及び歯科治療のため歯科医師が知っておくべき認知症の基本事項 新オレンジプランから見えてくること	日本歯科医師会雑誌	68(11)	6-15	2016
枝広あや子, 平野浩彦	【認知症と歯科-いま地域歯科医院に求められることとは何か?-】 (Part 3) 实例からみる認知症と歯科 地域の開業歯科医がおさえておくべき知識・対応法 本章では、地域の歯科医院で実際に起こりうるケースを想定し解説します	歯会展望	127(2)	250-259	2016
金 憲経, 平野浩彦	高齢者の食を支えるために オーラル・フレイルの概念を討議する 都市部在住フレイル高齢者の口腔機能について	メディカル朝日	44(11)	44-45	2015
枝広あや子, 渡邊 裕, 平野浩彦, 古屋純一, 中島純子, 田村文誉, 北川昇, 堀 一浩, 原 哲也, 吉川峰加, 西 恭宏, 永尾 寛, 服部佳功, 市川哲雄, 櫻井 薫 (日本老年歯科医学会ガイドライン委員会)	認知症患者の歯科的対応および歯科治療のあり方 学会の立場表明2015	老年歯科医学	30(1)	3-11	2015
枝広あや子	<診察時にできる老嚥と摂食嚥下障害の評価>5診察時にできる認知症の摂食嚥下障害の評価	Modern Physician	35(12)	1443-1446	2015

枝広あや子	高齢者医療での歯科に関するMinimum Skills,臨床に役立つQ&A 4. 認知症などをもつ要介護高齢者の口の管理のポイントを教えてください	Geriatric Medicine	53(11)	1195-1198	2015
枝広あや子	特集 高齢者の食支援 Seminar 7. 認知症患者の食支援を見据えた歯科の関わり	Geriatric Medicine	54(1)	49-52	2016

IV. 研究成果の刊行物・別刷

ORIGINAL ARTICLE: EPIDEMIOLOGY,
CLINICAL PRACTICE AND HEALTH**Factors associated with self-rated oral health among community-dwelling older Japanese: A cross-sectional study**Yuki Ohara,^{1,2} Hirohiko Hirano,¹ Yutaka Watanabe,³ Shuichi Obuchi,⁴ Hideyo Yoshida,¹ Yoshinori Fujiwara,⁵ Kazushige Ihara,⁶ Hisashi Kawai⁴ and Shiro Mataka⁷

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Objectives: A cross-sectional study was carried out to investigate the determinants of self-rated oral health among community-dwelling older people in Japan.

Methods: The participants were 897 (357 men and 540 women) aged 65 years and over who participated in a comprehensive geriatric health examination, which included an oral examination, a face-to-face interview assessing cognitive function, questionnaires regarding depressive symptoms and functional capacity, and a medical examination. The oral examination measured indices of oral health status: number of present teeth, number of functional teeth, occlusal force and amount of resting saliva. Multiple logistic regression analyses were carried out to determine the factors associated with poor self-rated oral health.

Results: The mean age of the participants was 73.5 ± 5.0 years. The prevalence of poor and rather poor self-rated oral health was 11.5% and 29.5%, respectively. Multiple logistic regression analyses showed that the number of present teeth (odds ratio [OR] 0.97, 95% confidence intervals [CI] 0.95–0.99), difficulty in mastication (OR 3.20, CI 2.18–4.70), presence of xerostomia (OR 1.43, CI 1.02–2.01), total score on the MoCA-J (OR 1.06, CI 1.01–1.11), and reduction in frequency of leaving the house (OR 1.64, CI 1.12–2.41) were significantly associated with poor self-rated oral health.

Conclusions: The present results suggested that self-rated oral health was a significant factor in oral health status as well as overall well-being among community-dwelling older Japanese people. *Geriatr Gerontol Int* 2015; 15: 755–761.

Keywords: community-dwelling, lifestyle, oral function, self-rated oral health, xerostomia.

Introduction

As the Japanese population ages, researchers have become increasingly interested in the oral health of older people^{1–3} Oral health is integral to overall health and well-being, and shares many of the same risk factors and determinants as other chronic diseases, such as cardiovascular disease, cancer, chronic respiratory disease and diabetes.^{4,5} Oral health problems can result

in pain and discomfort, and lead to problems with eating, communication and appearance.⁶

Older adults in particular tend to experience higher rates of tooth loss, dental caries, periodontal disease and oral cancer.^{7–9} Self-rated oral health is a personal assessment of the functional, psychological and social impact of oral disease on overall well-being, and it can be used both to summarize a person's oral health status and as an oral health outcome measure.^{10,11} Self-rated questionnaires provide a simple, direct way of capturing perceptions of health and oral health that are valid, reliable, and cost-effective.¹² International studies have identified several factors associated with self-rated oral health in older people.^{1,3,4,6,10,11} However, to the best of our knowledge, few studies in Japan have investigated the relationship between self-rated oral health and well-being,

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including psychosocial factors and cognitive function. The aim of the present study was to investigate the factors associated with poor self-rated oral health in community dwelling older adults.

Methods

Study population

Community-dwelling older people ($n = 897$, 357 men, 540 women; age 65–84 years) were invited to undergo a comprehensive geriatric health examination by the Tokyo Metropolitan Institute of Gerontology. The mean age of the participants was 73.5 ± 5.0 years. The examinations were carried out over 11 days in the Itabashi Ward, which is located in the north of Tokyo, in October 2011.

Instruments

Self-rated oral health

Self-rated oral health was assessed with the question “What do you think of your oral health?” with four response options. For the statistical analysis, the categories “good” and “rather good” were combined, as were the categories “rather poor” and “poor.”

Self-assessed oral function

We asked three dichotomous questions regarding oral function, as follows: “Do you have difficulty in chewing solid food?”, “Do you choke when drinking tea or soup?” and “Does your mouth feel dry?”, which were indicators of difficulty in mastication, difficulty in swallowing and xerostomia (i.e. chronic dry mouth),¹³ respectively.

Oral examination

Oral examinations were carried out by dental hygienists who received standardization training before the study. The examination consisted of several different components. The number of present teeth and functional teeth were counted. Functional teeth were defined as present teeth and missing teeth treated by prosthesis, such as dentures or dental implants; teeth with severe decay and stump teeth were omitted from the definition of functional teeth, because they are not used for mastication.¹⁴

Occlusal force was measured using a pressure-sensitive film (Dental Prescale 50HR Type R; Fuji Photo Film, Tokyo, Japan) and its analytical equipment (OCCLUZER, FPD-707; Fuji Photo Film). Participants sat on a chair with their heads upright and unsupported, in a natural position, with their Frankfurt horizontal plane parallel to the floor. Participants were asked to

bite the pressure-sensitive film with maximal force. Those who wore a removable denture bit the sheets with their dentures in place.¹⁵ Occlusal force was measured in newtons (N).

Resting saliva was collected using the modified cotton roll method.^{16–18} A preweighed cotton roll was placed under the tongue, and the participants were instructed to close their mouth for 30 s, after which the cotton roll was removed. The amount of saliva absorbed by the cotton was then measured using an electronic scale. This measurement was carried out once for each participant.

Measurements of functional capacity

Functional capacity contains two major components: “basic activities of daily living (ADL)” and “higher-level functional competence”.¹⁹ We assessed higher-level competence (e.g. preparing meals, managing money, taking medications) using the Tokyo Metropolitan Institute of Gerontology index of competence (TMIG-IC; Table 1). This multidimensional 13-item competence index has been shown to have high reliability and validity.²⁰ Higher scores reflect a higher level of functional competence. This index is widely accepted and used in Japan to evaluate functional capacity in older adults.

Cognitive function

The Japanese version of the Montreal Cognitive Assessment (MoCA-J) was used to assess cognitive function. The MoCA-J is a useful cognitive test for screening mild cognitive impairment, and has been recommended for use in community-based geriatric health screenings.²¹ This scale provides a total score ranging from 0 to 30 points, with higher scores representing better cognitive function.

Lifestyle factors

These dichotomous questionnaire items assessed what factors negatively influenced older people’s lives. Participants were asked whether their frequency of leaving the house had reduced in the last year, whether they had been hospitalized in the last year, whether they had fallen in the last year and whether they smoked.

Zung Self-Rating Depression Scale

The Zung Self-Rating Depression Scale (SDS), a widely used instrument for assessing the severity of depression, was administered.^{22,23} The Japanese version of the SDS is a self-report 20-question instrument that assesses the psychological and somatic symptoms of depression. Ten questions are positively worded, and 10 are

Table 1 Questions on the Tokyo Metropolitan Institute of Gerontology index of competence

1. Can you use public transportation (bus or train) by yourself?
2. Are you able to shop for daily necessities?
3. Are you able to prepare meals by yourself?
4. Are you able to pay bills?
5. Can you handle your own banking?
6. Are you able to fill out forms for your pension?
7. Do you read the newspaper?
8. Do you read books or magazines?
9. Are you interested in new stories or programs dealing with health?
10. Do you visit the homes of friends?
11. Are you sometimes called on for advice?
12. Are you able to visit sick friends?
13. Do you sometimes initiate conversations with young people?

The response to each item can be "yes" (able to do) or "no" (unable). The total score is the number of items answered "yes". The possible range of competence score in this index is 0–13 points. Therefore, a higher score indicates higher functional capacity.

negatively worded. Each question is scored on the following four-point scale: 1, a little of the time; 2, some of the time; 3, a good part of the time; and 4, most of the time. To obtain the total score, the positive items are reversed, and then the items are summed.²⁴

Data analysis

The χ^2 -test (for categorical variables), Student's *t*-test, and the Mann-Whitney *U*-test (for continuous variables) were used to examine differences between the good and poor oral health groups. Multiple logistic regression analysis (forced entry analysis) was carried out to identify factors associated with self-rated oral health. The dependent variable was poor self-rated oral health, whereas variables that resulted in a *P*-value of <0.2 in the bivariate analysis were determined to be independent variables. Before multiple logistic regression analysis, the dependent variables for which correlation coefficients were ≥ 0.8 were deleted in order to avoid multicollinearity. All statistical analyses were carried out using SPSS Statistics version 20.0J software for Windows (IBM, Tokyo, Japan). The level of significance was set at *P* < 0.05.

Ethical considerations

The present study was approved by the ethics board of the Tokyo Metropolitan Institute of Gerontology (Issue # 23–1235 in 2011). Written informed consent was obtained from each participant.

Results

Participants' background and oral health status statistics are shown in Table 2. The prevalence of poor and

rather poor self-rated oral health was 11.5% and 29.5%, respectively. Comparisons between the good and bad oral health groups are shown in Table 3. There were significant differences in the number of present and functional teeth, occlusal force, functional capacity, depressive symptoms, smoking habit, reduction in frequency of leaving the house, a fall in the last year, difficulty in mastication and swallowing, and the presence of xerostomia between the groups.

Table 4 presents the results of the multiple logistic regression analyses of self-rated oral health. Multiple logistic regression analyses showed that the number of present teeth (odds ratio [OR] 0.97, 95% confidence intervals [CI] 0.95–0.99), difficulty in mastication (OR 3.20, CI 2.18–4.70), presence of xerostomia (OR 1.43, CI 1.02–2.01), total score on the MoCA-J (OR 1.06, CI 1.01–1.11) and reduction in frequency of leaving the house (OR 1.64, CI 1.12–2.41) were significantly associated with poor self-rated oral health.

Discussion

In the present study, we investigated broader factors associated with poor self-rated oral health among the community-dwelling older Japanese population, including oral health status, psychosocial factors, functional capacity and cognitive function. Approximately 40% of the older participants in the present study reported poor oral health. Previous reports showed that the percentages of poor self-rated oral health in the older population ranged from 17.4% to 61.3%.^{1,3,6,10,25,26} This wide variability might be due to the differences among the study populations. The percentage of poor self-rated oral health found in the present study was within the range of the previous reports.

Table 2 Basic characteristics of the study population

Continuous variables	Total (<i>n</i> = 897)	
	Mean	SD
Age (years)	73.5	5.0
No. present teeth	19.5	9.2
No. functional teeth	26.7	3.8
Occlusal force (N)	497.9	341.3
MoCA-J total points	23.2	3.7
TMIG-IC total points	12.4	1.3
SDS total points	34.4	9.0
Amount of resting saliva (g)	0.3	0.2
Categorical variables	n	%
Self-rated oral health		
Good	59	6.6
Rather good	470	52.4
Rather poor	265	29.5
Poor	103	11.5
Smoking habit (% yes)	92	10.3
Reduction in frequency of going out (% yes)	197	22.0
Hospitalization in the past 1 year (% yes)	105	11.7
Experience of fall in the past 1 year (% yes)	205	22.9
Difficulty in mastication (% yes)	215	24.0
Difficulty in swallowing (% yes)	186	20.8
Xerostomia (% yes)	312	34.8

MoCA-J, Japanese version of Montreal Cognitive Assessment; SD, standard deviation; SDS, Self-rated Depression Scale; TMIG-IC, Tokyo Metropolitan Institute of Gerontology index of competence.

In the present study, poor self-rated oral health was significantly associated with chewing problems and the number of present teeth. Although the participants of the present study rated their own oral function regarding mastication, swallowing, and xerostomia, there was no significant association between swallowing problems and self-rated oral health, and the OR of xerostomia was relatively lower than that of chewing problems. It is interesting that chewing problems was a stronger factor associated with poor self-rated oral health compared with other oral complaints, such as swallowing problems and xerostomia. Locker *et al.* reported one of the main complaints of older people was not biting well, and masticatory function is an essential factor affecting the independently living older population in particular.²⁷ Furthermore, decline in chewing ability is related to higher-level functional capacity,²⁸ general health status,²⁹ cognitive function³⁰ and food intake.³¹ Therefore, it is important to ensure that older adults have proper chewing ability, as this will help maintain their quality of life.

The present study showed an association between poor self-rated oral health and xerostomia in older persons. Xerostomia is another common complaint among the older population.^{16,32-34} Previous studies reported that xerostomia leads to oral dysfunction, including swallowing, mastication and speaking difficulties.^{13,33} Saliva plays an important role in maintaining oral health status because of its antibacterial, buffering and moistening functions.³⁵ Therefore, xerostomia affects quality of life and activities of daily living, and likely influences self-rated oral health as well. It is necessary for oral health professionals to consider xerostomic problems when managing oral health for older people.

In the present study, there was no significant association between depressive symptoms and poor self-rated oral health. Previous reports had suggested that self-rated oral health was related to psychological well-being, including such variables as depressive symptoms, chronic stress and life satisfaction.^{1,6,25,36,37} In contrast, the decline of cognitive function was independently associated with self-rated oral health. Cognitive impairment can be an early sign of clinical dementia,³⁸ and it influences disability³⁹ and mortality.⁴⁰ Okamoto *et al.* reported that tooth loss was related to cognitive function among community-dwelling older Japanese.⁴¹ However, few studies have investigated the association between cognitive function and self-rated oral health among the independent older population, so the evidence remains insufficient. Previous studies reported the association between cognitive impairment and depression,⁴² so we tested the correlation coefficient between the dependent variables in order to avoid multicollinearity before carrying out the multiple logistic regression analysis. The correlation coefficient between cognitive function evaluated by the MoCA-J and depressive condition evaluated by the SDS was just -0.174 (data not shown). Thus, cognitive function and depressive symptoms were not potential confounding factors for self-rated oral health. This was the first population-based study that investigated both depressive symptoms and cognitive function, so the results offer new information. It appears that cognitive function is an important issue for promoting oral health among the older population of Japan.

The present study suggested that reduction in frequency of leaving the house was an independent risk factor of poor oral health. We speculated that this is because a lower frequency of leaving the house would affect the regularity of dental clinic visits. Dental disease is easily managed or prevented through proper daily care and regular use of professional dental services. However, older persons face many challenges in accessing such dental services.⁴³ Thus, oral healthcare providers should pay special attention to preventive care for older people with functional disabilities and decreasing frequency of leaving the house.

Table 3 Bivariate analyses between self-rated oral health and selected predictor variables

Predictor variables	Good/rather good (<i>n</i> = 529)		Rather poor /poor (<i>n</i> = 368)		<i>P</i> -value
	Mean	SD	Mean	SD	
Age (years)	73.5	5.0	73.5	5.0	0.977 [†]
No. present teeth	21.7	8.9	16.5	8.9	<i>P</i> < 0.001 [#]
No. functional teeth	27.2	3.3	26.0	4.3	<i>P</i> < 0.001 [#]
Occlusal force (N)	582.4	365.5	375.9	258.6	<i>P</i> < 0.001 [#]
MoCA-J total points	23.4	3.6	23.0	3.7	0.139 [#]
TMIG-IC total points	12.5	1.2	12.2	1.4	<i>P</i> < 0.001 [#]
SDS total points	33.2	8.6	36.1	9.4	<i>P</i> < 0.001 [#]
Amount of resting saliva (g)	0.28	0.19	0.28	0.22	0.514 [#]
Categorical variables	<i>n</i>	%	<i>n</i>	%	
Sex					
Male	220	41.6	137	37.2	0.107 [§]
Female	309	58.4	231	62.8	
Smoking habit (% yes)					<i>P</i> < 0.001 [§]
Reduction in frequency of leaving the house (% yes)	81	15.3	116	31.5	<i>P</i> < 0.001 [§]
Hospitalization in the last one year (% yes)	64	12.1	41	11.1	0.371 [§]
Experience of fall in the last one year (% yes)	103	19.5	102	27.7	0.003 [§]
Difficulty in mastication (% yes)	61	11.6	154	41.8	<i>P</i> < 0.001 [§]
Difficulty in swallowing (% yes)	96	18.2	90	24.5	0.013 [§]
Xerostomia (% yes)	150	28.4	162	44.0	<i>P</i> < 0.001 [§]

[†]Student's *t*-test; [#]Mann-Whitney *U*-test; [§] χ^2 -test. MoCA-J, Japanese version of Montreal Cognitive Assessment; SD, standard deviation; SDS, Self-rated Depression Scale.; TMIG-IC, Tokyo Metropolitan Institute of Gerontology index of competence.

Table 4 Multiple logistic regression analysis of associated factors with poor self-rated oral health

	Adjusted OR	95% CI	<i>P</i> -value
No. present teeth	0.97	(0.95–0.99)	0.008
No. functional teeth	0.98	(0.94–1.03)	0.553
Occlusal force (N)	1.00	(1.00–1.00)	<i>P</i> < 0.001
Difficulty in mastication (for yes)	3.20	(2.18–4.70)	<i>P</i> < 0.001
Difficulty in swallowing (for yes)	1.05	(0.72–1.55)	0.792
Xerostomia (for yes)	1.43	(1.02–2.01)	0.036
Smoking habit (for yes)	0.61	(0.36–1.03)	0.063
MoCA-J total points	1.06	(1.01–1.11)	0.018
SDS total points	1.02	(1.00–1.03)	0.111
TMIG-IC total points	0.97	(0.84–1.11)	0.644
Reduction in frequency of leaving the house (for yes)	1.64	(1.12–2.41)	0.012
Experience of fall in the last one year (for yes)	1.32	(0.92–1.91)	0.136

Forced entry, *P*-values are adjusted for sex. 95% CI, 95% confidence interval; MoCA-J, Japanese version of Montreal Cognitive Assessment; OR, odds ratio; SD, standard deviation; SDS, Self-rated Depression Scale; TMIG-IC, Tokyo Metropolitan Institute of Gerontology index of competence.

Although approximately one-quarter of Japanese young adults report poor oral health, it is a more important public health issue for the older population, who tend to experience more oral disease and functional decline.⁷ The present study is one of the few reports that investigated the factors associated with self-rated oral health focused particularly in the Japanese community-dwelling older population. The present results suggested that various factors, such as dental clinical condition, as well as psychosocial factors, were associated with poor oral health in the older population. Self-rated oral health is a key factor impacting on well-being and quality of life.⁵ In order to prevent impairment of oral function and well-being at an early stage, oral health professionals should assess these multiple factors.

There were some limitations in the present study. First, we cannot infer any causal relationship between poor self-rated oral health and associated factors because of the cross-sectional study design. Second, the participants in the present study were independently living individuals who volunteered to participate in the health examination; therefore, it is likely that they represented a healthier portion of the general elderly population. Further investigation including a longitudinal study would be necessary to confirm and expand these findings.

In conclusion, the present study showed that poor self-rated oral health was significantly and independently related to masticatory function, the presence of xerostomia, number of present teeth, cognitive function and reduction in frequency of leaving the house in community-dwelling older Japanese adults, after adjusting for confounding variables.

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Disclosure statement

The authors declare no conflict of interest.

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ORIGINAL ARTICLE: EPIDEMIOLOGY,
CLINICAL PRACTICE AND HEALTH

Relationship between chewing ability and sarcopenia in Japanese community-dwelling older adults

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Aim: It has been reported that if nutrient intake is unbalanced, muscle mass, muscle strength and physical performance declines, and therefore it is important to maintain chewing ability to keep a balanced nutrient intake. However, the relationship between chewing ability and sarcopenia has not been previously reported. Therefore, the present study investigated the relationship between chewing ability and sarcopenia in addition to known sarcopenia-related factors.

Methods: We examined 761 participants (average age 73.0 ± 5.1 years), who lived in the Itabashi city of Tokyo. Our research was designed to examine the relationship between chewing ability and sarcopenia. We carried out regression analysis to analyze the relationship with sarcopenia-related factors with consideration of the age of the participants.

Results: The 761 participants were divided into two groups in terms of the stage of sarcopenia according to whether there was a deterioration of muscle strength or physical performance. Furthermore, we carried out logistic regression analyses on the value as a dependent variable, including known sarcopenia-related factors. There were significant correlations of sarcopenia with age (odds ratio 2.37, 95% confidence interval 1.52–3.70), body mass index (odds ratio 0.75, 95% confidence interval 0.69–0.81) and chewing ability (odds ratio 2.18, 95% confidence interval 1.21–3.93).

Conclusions: The present study shows that chewing ability is related to sarcopenia, which is equal to the relationship with the known factor of age by odds ratio. **Geriatr Gerontol Int 2015; 15: 1007–1012.**

Keywords: chewing ability, color-changeable gum, community, elderly, sarcopenia.

Introduction

Sarcopenia, defined as the degenerative loss of skeletal muscle mass, has recently been considered to result from a decline in muscular strength.^{1,2} It has been reported that the age-related loss of skeletal muscle mass leads to a decline in activities of daily living (ADL) in older adults, leading to difficulties in maintaining their quality of life (QOL). Studies have shown that if nutrient intake is unbalanced, muscle mass, muscle strength and physical performance declines,³ and it is important to maintain chewing ability to keep a balanced nutrient intake.^{4,5} Enjoying meals is one of the

most important factors to support the QOL of senile older adults, and it is also important to maintain and promote their health.^{6,7}

Several studies have reported on the relationship between chewing ability and grip strength/physical performance,^{8,9} and on the relationship between tongue muscle thickness and sarcopenia,¹⁰ but there have been no reports addressing the possible relationship between chewing ability and sarcopenia.

Therefore, we carried out this research on Japanese community-dwelling older adults, and investigated the relationship between chewing ability and sarcopenia in addition to known sarcopenia-related factors.

Methods

Participants

The Tokyo Metropolitan Institute of Gerontology (TMIG) sent invitations for a comprehensive geriatric

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health examination for early detection and early care of geriatric syndrome to 7015 male and female older adults aged from 65 to 85 years who lived within nine towns in Itabashi city (Tokyo, Japan), excluding nursing home residents and those who had participated in our previous interventional research studies. Among them, 1325 people offered to attend and 835 people actually attended. Excluding withdrawals due to the terms of our research, and also exclusions of missing values due to people with heart pacemakers and/or walking difficulties, the data of 761 participants were analyzed in the present study.

This research was carried out at the TMIG from 25 September 2012 to 5 October 2012. The participants attended by walking, driving or being driven by family members, or by using public transportation, and furthermore, they were able to understand and follow our instructions. We received written informed consent from each participant individually. This research was carried out with permission of the TMIG Ethics Committee (Issue #.23–1253 in 2011).

Stages of sarcopenia

The guidelines of the European Working Group on Sarcopenia in Older People (EWGSOP) were used to classify the severity of sarcopenia (stage of sarcopenia [SSp]) according to muscle mass (skeletal muscle mass measured by bioelectrical impedance analysis [BIA]), muscle strength (grip strength) and physical performance (usual walking speed).¹¹ In addition, participants were classified by SSp into a healthy and presarcopenia group in which declines in muscle strength or physical performance were not observed (maintenance group [MG]), or into a sarcopenia and severe sarcopenia group in which declines in muscle strength or physical performance were significant (decline group [DG]). The cut-off value was according to the method established by the Asian Working Group for Sarcopenia (AWGS).¹²

General evaluation

Height

Each participant was advised to keep their heels, buttocks, back and head touching the stadiometer. Making sure that their neck, waist and knees were straight, their height was measured per 0.1 cm.

Weight

Each participant was advised to stand on a weight scale quietly, and the stable value of their weight was measured per 0.1 kg.

Skeletal muscle mass index

Body composition was measured with BIA using an InBody720 (Bio Space, Seoul, Korea), and extremity muscle mass (kg) was determined from the sum of the upper and lower extremities. We divided the measured extremity muscle mass by the squared height (m conversion), and the adjusted extremity muscle mass was used as the skeletal muscle mass index (SMI). We used the standard value set by the AWGS, which is less than 7.0 kg/m² for men and less than 5.7 kg/m² for women for the SMI cut-off value of sarcopenia.¹²

Nutrition evaluation

The body mass index (BMI) was measured as an indicator of the nutritional status of each participant. We divided the measured extremity height (m), and the weight was used as the BMI.

Physical function evaluation

Physical function was measured following the functional improvement manual issued by the Ministry of Health, Labor and Welfare.¹³

Grip strength

Grip strength was used as an indicator of muscle strength, and was measured using a Smedley dynamometer (As one, Osaka, Japan). Measurements were carried out twice, and the higher value was used.^{14,15} The cut-off value of grip strength was set as the lowest of quartile value, according to the method of the AWGS, which is less than 26.0 kg for men and less than 18.0 kg for women.¹²

Usual walking speed (walking ability)

Participants walked along a walking path with a 3-m acceleration zone, a 5-m measurement zone and a 3-m deceleration zone, and the time each participant's feet were in the swing phase (the foot apart from the ground) was measured from the start-point of the measurement zone to the end-point of the measurement zone. Measurements were taken twice, and the faster time was used in the analysis. The cut-off value of the walking speed was set as the lowest of quartile value, according to the method of the AWGS, which is less than 1.0 m/s.¹²

Oral examination

Oral examinations were carried out by two dentists and five dental hygienists who had standardized their methods before the study.