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Topics: Recent topics in public health in Japan 2019

＜ Review ＞

Recent measures in geriatric oral health care in Japan

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Abstract

In Japan, with rapid aging, the measures surrounding oral health care in the elderly have significantly improved. Previously, prioritized goals concerning the prevention of dental diseases and an increase in the number of remaining teeth were adopted. However, maintaining and improving oral function are the new goals to be adopted, in addition to those goals. For prolonging healthy life expectancy, countermeasures against the frailty of oral function are necessary because oral function is frequently found to be deteriorating in the elderly. It is said that lowering oral function is a significant risk factor for malnutrition and sarcopenia. The concept of "oral frailty" was initially advocated in Japan. Oral frailty among the community-dwelling elderly has a close association with their nutritional condition. A healthy diet with well-balanced masticatory and swallowing function greatly contributes to improving the entire body function. Recent Japanese oral health policy and novel approaches to oral health care in the elderly will be beneficial to the other middle-income Asian countries as well. Thus, this article reviews the current situation of geriatric oral health care and countermeasures against oral frailty as a new concern in geriatric oral health in Japan.

keywords: community dentistry, geriatric oral health policy, oral frailty, 8020 movement

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I. Introduction

Aging process is progressing rapidly in Japan, and the current aging rate has reached approximately 28% (April 2018). In the elderly, a healthy diet with adequate masticatory ability contributes to living an independent life in their community[1,2]. These are the fundamental requirements for extending a healthy life expectancy. Our previous study also reported a close relationship between chewing ability and general health status[3]. Thus, satisfactory mastication needs good oral health. Especially in older adults, it is necessary to prevent not only dental diseases such as dental caries and periodontal disease but also deterioration of oral function including chewing difficulties. In Health Japan 21 (2nd term), which is the national health plan in Japan, the prevention of tooth loss and the improvement of oral function are mentioned as primary targets for the elderly[4].

Measures for geriatric oral health slightly differ from those for middle-aged adults. In the aged subjects, it is especially critical not only to prevent dental diseases but also to maintain a healthy diet with satisfactory mastication. Based on these geriatric characteristics, "oral frailty" has been proposed as a new concept in Japan[5,6]. In the present article, we review the latest scientific findings and target areas in oral health care in the elderly. We also discuss future measures in geriatric oral health care in Japan.

II. Current situation of oral health in the elderly

1. The situation of tooth loss and the 8020 movement as a national health policy

The status of tooth loss is improving dramatically, even in the elderly. The proportion of people with 20 or more

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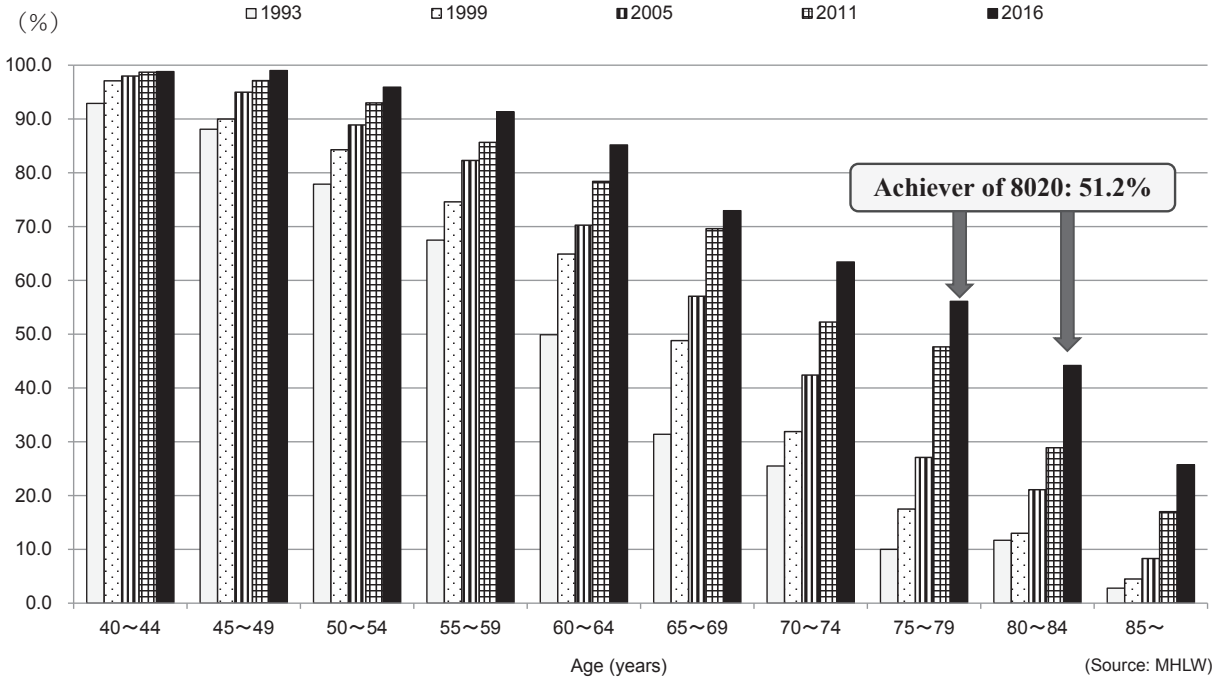


Figure 1 The rate of people having at least 20 teeth by age

remaining teeth at 80 years of age (8020 achievement rate) has already reached approximately 50% in 2016 (Figure 1). The 8020 achievement rate is a unique indicator of prevention of tooth loss. This indicator is used to evaluate the activities for the 8020 movement that have been developed in Japan[7,8]. An epidemiological finding suggests that it is desirable to have more than 20 teeth for a healthy diet[9]. If older adults have more than 20 teeth, they can eat almost all foodstuffs. Thus, the 8020 achievement rate has been adopted as a representative target in the elderly of Japan. So far, this nationwide movement has been successful.

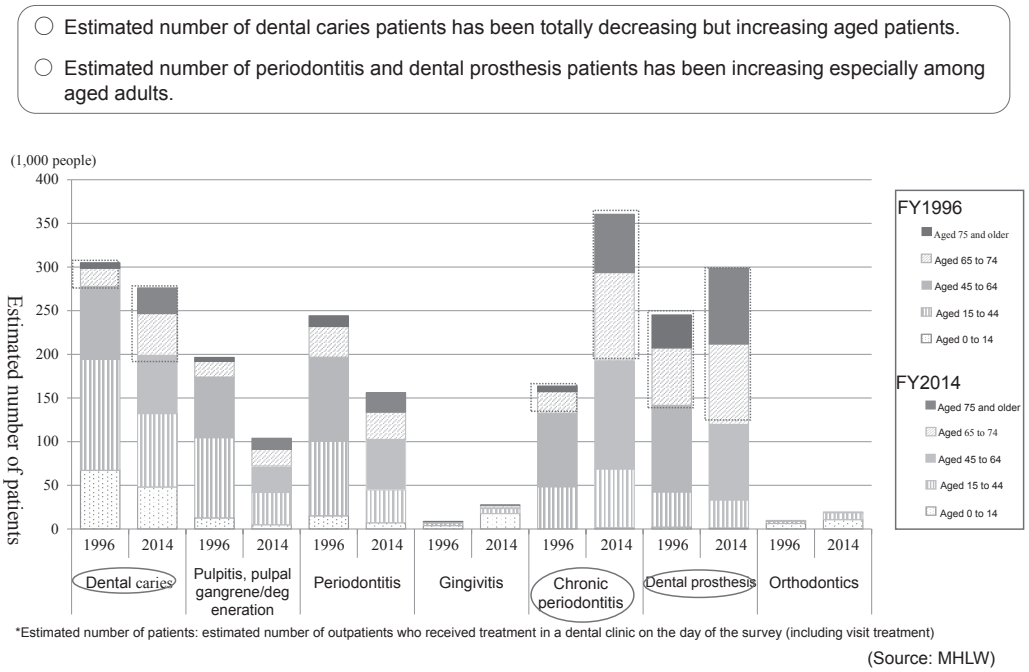


Figure 2 Estimated number of patients by the classification of dental diseases

2. Dental caries and periodontal disease in the elderly

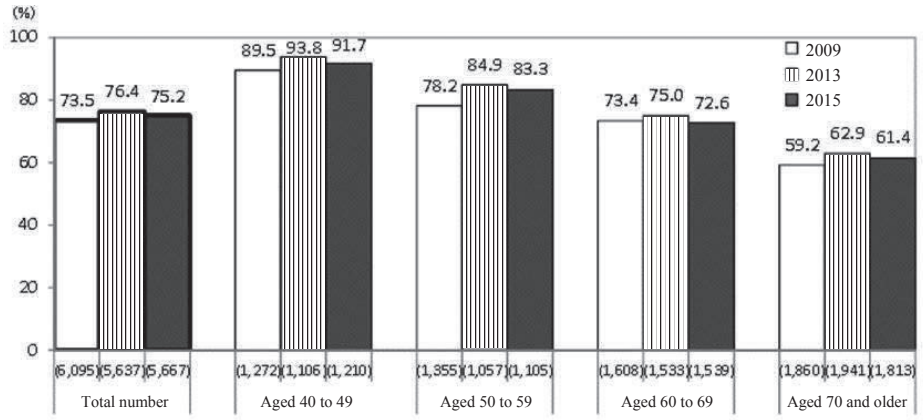
Figure 2 shows the variations in patient number by the classification of dental diseases. The elderly need to maintain oral health for more extended periods because the older adults today have many teeth compared to those from 30 years ago. If the elderly cannot practice adequate oral health maintenance habits, the risk of dental caries and periodontal disease will dramatically increase in them. Fortunately, we already have an effective method for the prevention of dental caries in the elderly. Silver diamine fluoride will be useful in suppressing the progression of dental caries, even in the disabled elderly[10]. Another dental problem in the elderly is the rapid increase in the occurrence of periodontal disease. Since periodontal disease has been reported to lead to an increased risk of diabetes[11], it is necessary to further promote preventive measures for periodontal disease in older adults.

3. Status of masticatory function

Figure 3 shows the trend of the subjective chewing evaluation by age. Masticatory ability, which is closely related to diet, decreases after the age of 60. National health and nutrition examination survey indicated that approximately 25% of the subjects in their 60s perceived a declining masticatory function. Older adults with sufficient chewing ability comprise a significantly lower percentage of the subjects suffering from malnutrition than those whose chewing ability is compromised[12]. Maintenance and improvement of masticatory function have a significantly positive influence not only on oral health but also on systemic health management in the elderly[13,14].

III. Decline in oral function and countermeasures against frailty in the elderly

In the recent health policy for the elderly in Japan, countermeasures against frailty are recognized as a fundamental requirement. "Frailty" is an initial state before the stage of requiring long-term care, characterized by weaker muscular strength and declining mental and social health; frailty is a critical state before the need for long-term care. Even aged adults living independently manifest gradual physical and mental deterioration due to physiological aging. Then, it gradually transitions through the frail state with physical, mental, and social weaknesses[15]. Once aged adults fall into the negative spiral caused by their frailty, it becomes very hard for the older adults to regain satisfactory mental/social health and avoid the requirement of long-term care. Malnutrition, frailty, and sarcopenia frequently occur simultaneously[16] (Figure 4). Several epidemiological studies have reported that dysphagia induced by the decline in oral function has a close relationship with the development of malnutrition[17]. Additionally, in a large-scale survey conducted in Japan (Kashiwa study), one of the earliest noted signs of sarcopenia was a decline in oral function[18].



*Percentage of the respondents answering "I can chew anything" was 74.1% in 2009, 78.1% in 2013 and 76.2% in 2015. The percentage has increased during the period.

(Reference)Goal of "Health Japan 21 (2nd term)"
Maintenance and improvement of oral cavity function (increase in the percentage of people who can chew well in their 60s)
Target value: 80%

Chewing ability has not improved ⇒ Inconsistent with the improvement in tooth loss

(Source: MHLW)

Figure 3 Chewing ability in the adult and elderly individuals

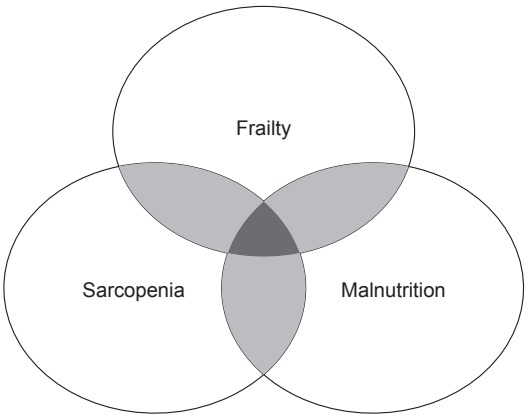


Figure 4 Relationship among malnutrition, sarcopenia and frailty

IV. Oral health checkup in the advanced elderly medical service system

Representative community health projects for oral frailty include oral health checkup in the advanced elderly (subjects who are older than 75 years) medical service system. This checkup involving the assessment of oral function has been conducted by the public sector since FY2014. In the new model for oral health checkup, initial signs of oral frailty are examined and reported. Effective remedial measures may be introduced according to the results of the checkup.

Table 1 shows the detailed items of the oral health checkup model for the old-old elderly population. Evaluation of oral function is essential in addition to a regular dental checkup to detect dental caries and periodontal disease. There are a few approaches for conducting oral function assessment for old-old population, as demonstrated by the public sector in other developed countries. Assessment of chewing ability, tongue movement, and swallowing problems is essential for the correct evaluation of oral function. Fortunately, some investigators have reported useful and easy methods to evaluate these oral functions, as follows:

1. Evaluation of swallowing function using a questionnaire

It is difficult to evaluate eating and swallowing functions with a single indicator because the oral function is complex and involves many organs. Thus, a questionnaire method with enough validity and reliability is beneficial for a simplified examination of oral function. Several investigators have reported some indicators to detect the initial risks of dysphagia, such as EAT 10 and DRACE[19,20]. These evaluation scales should be utilized in the oral health checkup model for the elderly.

2. Evaluation of tongue motor function

Since smooth tongue movement plays a critical role in sound feeding, swallowing, and articulation, tongue motor dysfunction directly leads to oral frailty. In Japan, tongue pressure measurement and oral diadochokinesis are often used as assessment tools for tongue motor function[21]. Oral diadochokinesis is an indicator of the pronunciation rate of the reference syllables (/pa/, /ta/, and /ka/) per second to evaluate tongue dexterity[22]. These three reference syllables are labial, dental, and velar consonants, respectively. In an epidemiological study targeting aged adults in Japan, it has been reported that the decline in tongue pressure and oral diadochokinesis have a close relationship with physical activity[6,18] In our research, it has also been shown that there is a significant relationship between dysphagia risk and oral diadochokinesis value[23].

3. Evaluation of chewing ability

Chewing ability was previously determined by eating referential food such as peanuts. However, this method frequently required time and effort. Subjective assessments have also been applied for the evaluation of chewing ability. However, a recent epidemiological study has indicated that the assessment using a color changing chewing gum in which the degree of discoloration varies depending on

Table 1 Items of oral health checkup for the advanced elderly more than 75 years old

1. Basic examination items on dental diseases
   - Teeth condition: including the number of teeth, caries and prosthetic condition
   - Periodontal condition
   - Mucous membrane condition
   - Oral health condition
2. Examination items on oral function
   - Occlusion: Molar occlusion assessment based on Eichner Classification
   - Chewing ability assessment: Questionnaire survey based on an assessment scale, chewing function measurement, etc.
   - Tongue function assessment: Tongue pressure measurement, tongue motion assessment based on oral diadochokinesis (ODK)
   - Swallowing function assessment: Repetitive saliva swallowing test (RSST), etc.
   - Mouth dryness assessment

chewing ability has been advantageous[24]. Furthermore, assessment using gummy jelly as a reference food can detect declining chewing ability[25]. The above methods provide a great advantage in the evaluation of mastication function, even in the oral health checkup for the community-dwelling elderly.

V. Characteristics of geriatric oral health policies in Japan

1. Approach to health promotion plan

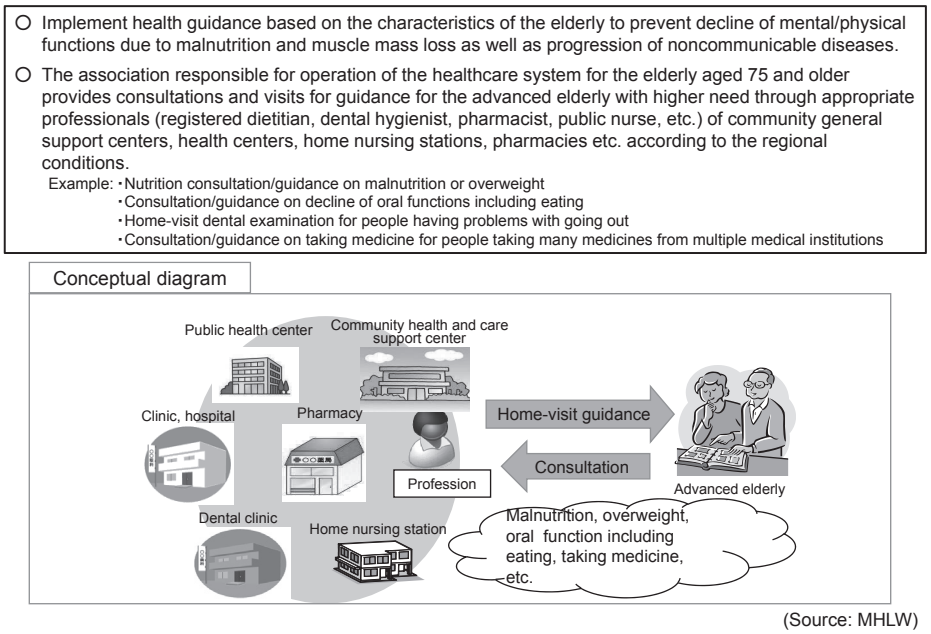
In Health Japan 21 (2nd term), some target values are set up to improve geriatric oral health (Table 2). Masticatory function is directly linked to nutritional intake, and approximately 25% of the individuals in their 60s will have insufficient chewing ability, which implies that they cannot eat various foods. Maintaining sufficient chewing ability is essential for a healthy diet and active life.

2. Measures to prevent malnutrition

Countermeasures against malnutrition are closely related to the prevention of frailty. Well-balanced coordination among multiple stakeholders, including dental professionals, has been warranted to avoid malnutrition among older adults (Figure 5). Three major elements, namely nutritional guidance, oral health guidance, and guidance for taking medications, have been suggested by different professionals to prevent malnutrition. The oral cavity is an entry point that takes in various foods into the body to provide it with nutrition. For the prevention of malnutrition, it is necessary to develop oral health measures and perform nutritional management simultaneously.

Table 2 Targets of geriatric oral health in Health Japan 21 (2nd term)

Indicator	Baseline data	Target
・Maintenance and improvement of oral function (increase in percentage of individuals in their 60s with good mastication)	73.4% (2009)	80% (2022)
・Prevention of tooth loss		
(a) Increase in percentage of 80-year-old individuals with over 20 teeth remaining	25.0% (2005)	60% (2022)
(b) Increase in percentage of 60-year-old individuals with over 24 teeth remaining	60.2% (2005)	80% (2022)
・Decrease in percentage of individuals in 60s with progressive periodontitis	54.7% (2005)	45% (2022)
・Increase in percentage of individuals who participated in dental check-up during the past year	34.1% (2009)	65% (2022)



(Source: MHLW)

Figure 5 Prevention of malnutrition of the elderly

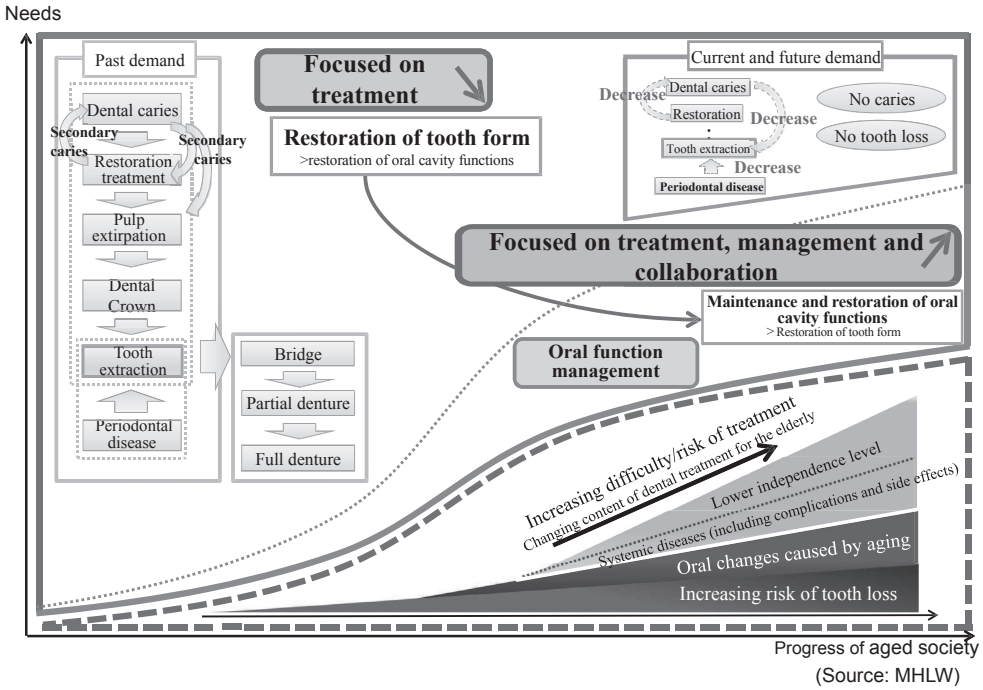


Figure 6 Conceptual diagram of future needs in dentistry

3. Perioperative management of oral function

Perioperative management of oral function was established by the revision of the medical payment system in April 2012. The purpose of preoperative management of oral function is to alleviate serious complications such as aspiration pneumonia after a surgical procedure for cancer. In collaboration with a medical doctor who performs cancer treatment, a dentist carries out comprehensive oral function management before hospitalization and after discharge. "Collaboration between medicine and dentistry" is crucial for the future in which a dentist is partially responsible for the prevention of postoperative infections. The cooperation between medicine and dentistry may be applied not only in the hospitals but also in the general dental clinics. Dental treatment needs in Japan are changing according to the advancing aging society (Figure 6).

After the revision of the medical payment system in April 2018, the continuous management of oral function has been covered by public medical insurance to promote oral health in the elderly. The fees for chewing ability and occlusal pressure tests are also being paid by the public medical insurance.

VI. Improvement in oral function based on scientific evidence

In a large-scale study on community-dwelling older adults conducted in Kashiwa city, it has been reported that the initial physical symptom of frailty is the decline in oral function. The decline in oral function affects various health indicators such as mortality rate[18]. These findings suggest that preventing oral frailty may be an efficient way to prolong healthy life expectancy.

Some results from our systematic review indicate the need to find a more effective intervention to improve oral function among the independent older adults[26]. In the review, we found several methods to improve oral function: continuous trial for three months, oral exercises with lectures on oral health, and oral exercise including lip and tongue motor exercises, once in two weeks for 90 minutes.

VII. Future issues in geriatric oral health

There is a difference between the means to promote oral health in the independent elderly and the dependent elderly. In the independent elderly, focusing on the prevention of dental diseases such as dental caries and periodontal diseases and countermeasures against oral frailty are necessary. Maintaining a healthy eating habit by early detection of the risk for oral frailty is also essential to extend healthy life expectancy. Understanding the oral function as well as dental diseases through dental checkup for the old-old population will provide several benefits for the prevention of oral frailty and malnutrition. Also, we still have a problem to be solved because there are no dental checkups conducted by the public sector for the elderly population in their 60s.

We need to conduct an examination of oral function for the elderly in their 60s to promote effective countermeasures for oral frailty. On the other hand, in the dependent elderly, management of oral health is a problem of nursing care.

The most prominent academic challenge is to establish detailed criteria and risk categories for oral frailty. As mentioned in the "Monitoring report at the Japan Society of Public Health," the research findings on oral frailty have increased dramatically over the past five years[27]. However, the evidence for the criteria for oral frailty is still not clear. Some researchers suggest that the accumulation of scientific evidence on oral frailty is an urgent measure that may help develop more effective measures for the maintenance of geriatric oral health. The findings and experiences in Japan could provide a meaningful direction in the issue of battling oral frailty in almost all Asian countries with similar aging problems. So far, geriatric oral health care activities mainly carry out recovery of occlusion and shape of teeth in many countries. However, additional approaches to improve oral function will be necessary for these countries in the future.

Acknowledgment

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Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this article.

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日本における高齢者歯科保健施策の動向と今後の展望

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抄録

高齢化が著しい日本において，歯科口腔保健施策は大きな変容を遂げている．これまで，高齢期の歯科保健対策において，最も重要視されていた目標は現在歯数の増加であった．しかし，歯科保健対策の進展に伴い，現在歯数の増加だけではなく，口腔機能の維持・向上を図り，健全な摂食を維持することが新たな口腔保健の目標になりつつある．健康寿命の延伸を図るうえで，高齢期のフレイル対策は必須の要件であり，複合的な対応策を取る必要がある．生理的老化に伴い，健康な高齢者であっても口腔機能の低下が認められることが多い．このような口腔機能の低下は，低栄養やサルコペニアを引き起こす重大なリスク要因となる．日本で提唱された新しい概念である「オーラルフレイル」は，超高齢社会に突入した日本における今後の歯科保健対策に多くの示唆を与えるものである．円滑な咀嚼や嚥下がもたらす健康な食生活は，身体的健康の維持・向上のための基盤的な条件であるため，オーラルフレイル対策は，地域在住高齢者に対する低栄養対策と密接な関連を有する．また，これらの日本の知見は，高齢化が今後大きく進展するアジア各国でも有用な示唆を与えるものと考えられる．そこで，本稿では日本における高齢者歯科保健対策とオーラルフレイル対策の現状と今後の課題について概説する．

キーワード：地域歯科保健，高齢者歯科保健対策，オーラルフレイル，8020運動