Prevalence of oral health-related conditions that could trigger accidents for patients with moderate to severe dementia

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ABSTRACT

Objective:

This study was performed to determine the prevalence of oral health conditions unnoticed by doctors and ward staff that may increase risk of incidents and/or accidents in hospitalized patients with moderate–severe dementia.

Background data discussing the present status of the field:

Dementia patients may not recognize risks in the mouth, such as tooth mobility or ill-fitting dental prostheses and/or dentures. In addition to the risk of choking, injury by sharp edges of collapsed teeth or prosthodontics could pose risks. However, many previous publications were limited to case reports or series.

Materials and methods:

Ninety-two consecutive hospitalized dementia patients (M: 52, F: 40, median age: 82.5 y, range: 62 – 99 y, from 2011 to 2014), referred for dentistry for dysphagia rehabilitation, were enrolled in this study. Participants referred for dental treatment with dental problems detected by ward staff were excluded. All participants had a Global Clinical Dementia Rating Score > 2. Their dental records were evaluated retrospectively for issues that may cause incidents and/or accidents.

Results:

Problems in the mouth, e.g., tooth stumps, dental caries, and ill-fitting dentures, were detected in 51.1% of participants (47/92). Furthermore, 23.9% (22/92) showed risk factors that could lead to incidents and/or accidents, e.g., falling out of teeth and/or prosthodontics or injury by sharp edges of teeth and/or prosthodontics.

Conclusions:

Hospitalized moderate–severe dementia patients had a high prevalence of oral health conditions unnoticed by doctors and ward staff that may increase risk of incidents and/or accidents.

INTRODUCTION

The proportion of older people with dementia is increasing steadily in many countries (1-3). Many older people with dementia live in nursing homes (4), and most require assistance with personal care (5). Patients with dementia have a higher incidence of oral diseases than healthy people (6). Therefore, it is important for care personnel to be attentive to their patients' oral health status, and thorough oral health care measures are required to prevent oral health problems (7).

There has been a great deal of recent discussion regarding the requirement of appropriate oral management for dementia patients. Many studies have demonstrated poor oral health status among the institutionalized elderly population and emphasized the importance of maintenance of oral hygiene (8-13). There is evidence from literature reviews confirming clinicians' observations of poor oral health in older adults with dementia (14), while the occurrence of risk factors that may lead to incidents and/or accidents represents a larger problem. In 2004, the World Health Organization (WHO) launched a patient safety program in response to a World Health Assembly Resolution (2002) urging the WHO and member states to pay close attention to the problem of patient safety (15). Its establishment underlined the importance of patient safety as a global health care issue, and worldwide activities for patient safety are currently underway (15), but necessary measures for oral health-related conditions that could trigger accidents in patients with dementia are overdue. Elderly individuals with dementia are known to be at increased risk of choking due to a variety of mechanisms, including inhalation of foreign material. Patients with severe dementia may not recognize risk factors in the mouth, such as mobility of teeth or ill-fitting dental prostheses and/or dentures, which may fall into the throat. Indeed, there have been many case reports regarding swallowed dentures (16, 17), including an unnoticed case (18) and a fatal case (19), but many publications were limited to case reports or case series, and little is known about the prevalence of dementia patients with

oral risk factors. In addition to choking, we often discover injury by sharp edges of collapsed teeth with advanced caries and/or ill-fitting or collapsed prosthodontics on first dental examination in such patients.

Our hospital (Mannari Hospital) is a psychiatric hospital with 500 beds, and it has many inpatients not only with psychiatric diseases but also with dementia. The Department of Dentistry provides dental treatment and oral care for many inpatients with dementia. In almost all cases, dental examination for dementia patients is prompted by a referral from a medical doctor in the early period after admission. The aims of these referrals can be roughly classified into two groups, i.e., dental problems and dysphagia rehabilitation, because our dental division includes dentists and a speech therapist specializing in dysphagia rehabilitation. In the former case, the medical doctor and/or ward staff (nurses and nursing assistants) notice dental problems and refer the patient to the Department of Dentistry, while in the latter case, many patients are referred simply because of dysphagia problems without taking their mouth condition into consideration. However, we often discover unnoticed dental problems in the mouths of patients referred for dysphagia rehabilitation. We also frequently encounter risk factors that could lead to incidents and/or accidents, such as loose teeth and/or prosthodontics, injury by sharp edges of teeth and/or prosthodontics, biting on residual ridges, etc.

Therefore, the prevalence of patients with dental problems unnoticed by doctors and ward staff, which could lead to incidents and/or accidents, in dementia wards could be determined by obtaining rough trends based on evaluation of the oral condition of patients with dysphagia. This study was performed to determine the prevalence of oral health conditions unnoticed by doctors and ward staff that may increase risk of incidents and/or accidents in hospitalized moderate–severe dementia patients.

PARTICIPANTS and METHODS

Participants

Ninety-two consecutive hospitalized dementia patients (M: 52, F: 40, median age: 82.5 y, range: 62 – 99 y, from 2011 to 2014) in Mannari Hospital, referred for dentistry with the aim of dysphagia rehabilitation, were enrolled in this study. Participants referred for dental treatment with dental problems detected by ward staff were excluded. Dementia was diagnosed by psychiatrists according to the Diagnostic and Statistical Manual of Mental Disorders (DMS)-5 (20). In almost all cases, participants were admitted to our hospital by transfer from a nursing home for the elderly because of worsening of symptoms secondary to dementia. The residence times in previous nursing homes ranged from 6 months to several years. None of these nursing homes had a department of dentistry, and therefore participants did not receive dental treatment during their stays with the exception of symptomatic treatment provided by visiting dentists as requested by the institute. All participants had a Clinical Dementia Rating Score > 2 (21). The types of dementia in this cohort were as follows: Alzheimer's disease, $n = 63$ (68.5%); vascular dementia, $n = 22$ (23.9%); dementia with Lewy bodies, $n = 5$ (5.4%); and frontotemporal dementia, $n = 2$ (2.2%). The ratio of oral feeding/tube feeding was 56/36 (60.9%/39.1%). This study was approved by the Ethics Committee of Mannari Hospital. We obtained informed consent from the participants if possible and their guardians according to the *Ethical Guidelines for Medical and Health Research Involving Human Subjects* established by the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labour and Welfare, Japan.

Evaluation of dental problems

The records of first dental examination for each participant in our hospital were reviewed and their oral conditions were evaluated. The median and range of tooth number of participants were 2 (0 – 28). The numbers of participants with and without use of dentures were 32 and 59,

respectively. First, the presence or absence of a chart description made by dentists engaged in evaluation on first visit regarding dental problems that could be clearly understood on visual inspection by dentists but unnoticed by doctors and ward staff, including conditions generally requiring dental treatment such as dental caries, periodontal disease, ill-fitting dentures, tooth stumps, etc., was extracted and summarized. Second, the validities of judgments by the dentists engaged in the first visit were verified by another dentist from our hospital by reviewing the records of first dental examination, including dental photographs and radiographs, if they were available. Our hospital has a total of five dentists (one full-time and four part-time). Finally, we summarized the types of problems that could lead to incidents and/or accidents detected by the dentists.

In Japan, many hospitals judge the level of incidents and/or accidents according to the *level of medical incidents and/or accidents* defined by the Council of Medical Safety Management of National University Hospitals as follows: level 0, error or malfunction of pharmaceutical product(s) and/or medical instrument(s), but with no adverse effect on the patient; level 1, no harm to the patient, but the possibility of some influence cannot be excluded; level 2, no requirement of measures and treatments, but necessitating reinforcement of patient observation, slight change in vital signs, or inspection for confirmation of safety; level 3a, requirement of simple measures and treatments (sterilization, compress, skin suture, medication with analgesics); level 3b, complicated measures (marked changes in vital signs, requirement of respirator, operation, extension of hospitalization stay, hospitalization of outpatient, bone fracture, etc.); level 4a, permanent complication with aftereffects, but no serious functional or esthetic outcome; level 5, death (except by natural process of underlying disease).

We defined oral health-related conditions that could trigger incidents and/or accidents in patients as conditions that may cause > level 3a as choking, injury, and recurrent temporomandibular joint dislocation. At this stage, the dentist in charge and another dentist were engaged, and both made decisions.

RESULTS

Frequencies of participants with dental problems

The frequencies of participants with dental problems requiring dental treatment in the mouth are shown in Figure 1. Dental problems that could be clearly understood on visual inspection of the mouth by dentists, such as dental caries, periodontal disease, ill-fitting dentures, and tooth stumps, were detected and considered to require dental treatment in 51.1% of participants (47/92). Furthermore, 23.9% of the whole cohort (22/92) and 46.8% of those requiring dental treatment (22/47) were positive for risk factors that could lead to incidents and/or accidents, and urgent measures to address these issues were considered important.

Details of risk factors that could lead to incidents and/or accidents

The outer circle in Figure 1 and Table 2 present details regarding the risk factors that could lead to incidents and/or accidents. The following risk factors were summarized in participants positive for risk factors that could lead to incidents and/or accidents and in the whole cohort: falling out of teeth and/or prosthodontics [$n = 12$, 54.5% (12/22) and 13.0% (22/92), respectively], injury by sharp edges of teeth and/or prosthodontics [$n = 4$, 18.2% (4/22) and 4.3% (4/92), respectively], injury by biting on residual ridge (simply caused by occlusion without sharp edges) [$n = 2$, 9.1% (2/22) and 2.2% (2/92), respectively], and recurrent dislocation of the temporomandibular joint [$n = 4$, 18.2% (4/22) and 4.3% (4/92), respectively]. There were no participants with more than one condition at the same time.

DISCUSSION

Among hospitalized moderate–severe dementia patients in our wards, the frequency of participants with oral risk factors that could lead to incidents and/or accidents, e.g., accidental swallowing aspiration, choking, injury, etc., was 13.0% of all participants referred to the Department of Dentistry for dysphagia rehabilitation only. All issues that were discovered were treated or managed by the ward staff if the participant's general condition was such that they were unable to receive dental treatment. As these participants were referred simply because of dysphagia problems without considering the condition of the mouth, our results indicate a rough trend for the prevalence of oral risk factors that could lead to incidents and/or accidents among moderate–severe dementia patients. Even in cases in which the medical referral letter specified only dysphagia rehabilitation, the actual aim may have been to improve total oral condition. Therefore, this was a pilot study performed to determine the prevalence of oral risk factors that could lead to incidents and/or accidents among such patients. Our findings were obtained in a specific hospital, and therefore may not be relevant to other institutions or geographic areas. Further data analysis, e.g., prospective cross-sectional surveys in institutions without a department of dentistry, are needed. However, our observation that more than 10% of these participants were positive for high risk factors in the mouth that could trigger incidents and/or accidents should be taken into consideration in future clinical management of dementia patients.

Many previous reports have emphasized that oral health care measures are required to prevent oral health problems (5, 6, 8-10, 13, 14). The importance of early evaluation and monitoring was shown to be essential, as older adults with dementia are particularly prone to developing complex oral diseases and conditions (14). Important relationships between general and oral health were identified (e.g., plaque accumulation and aspiration pneumonia) and information about these relationships should be disseminated to residential care staff and consulting health professionals (14). Sustainable communication and interactions between dental professionals and both residential care administrators and staff is essential for the successful maintenance of residents' oral health.

Oral assessments can be carried out successfully by residential care staff (including nurses and personal care attendants) to monitor their residents' oral health, evaluate oral hygiene care interventions, initiate a dental visit when required, assist with residents' individual oral hygiene care planning (important especially when attendance of dental professionals at the facility is limited or costly), and to triage and prioritize residents' dental needs (14). However, the comprehensiveness of the assessment may vary depending on the level of training that these staff have received in liaison with dental professionals (22, 23). Expert opinion has indicated that ideally oral health assessment screenings by a staff member and then by a dentist should be undertaken for a resident on their admission to a facility and regularly thereafter by staff and/or dentists as required (14), and our result support this opinion. Oral health care is necessary and would lead to improvements in the quality of life of dementia patients, while risk assessment and management should also be strongly emphasized in such populations. Although important for improving mastication and enhancing the quality of communication, the possibility of incidents and/or accidents, such as choking by teeth and/or prosthodontics that may have fallen out, injury by sharp edges of teeth and/or prosthodontics, or biting on the residual ridge caused by opposing teeth, and recurrent dislocation of the temporomandibular joint, should always be considered. In many cases, no history was available due to the cognitive impairment caused by the underlying dementia. However, dentists can discover such issues, many of which are preventable with appropriate dental treatment. Dentists in hospitals with dementia patients should be involved in mouth risk management. Especially, patients in institutional care may not be either physically or mentally capable of caring for dentures. Berketa (24) suggested that if patients do not wish their dentures left out, they or their guardians must sign a statement indicating these wishes. The awareness and education that some thought needs to be given to this decision may lead to improvements in the quality of life for denture wearers in such institutions (24). Dentists as risk managers of patients' mouth should make an appropriate decision, and we recommend that doctors utilize dentists in this role to improve the quality life

of dementia patients. As many hospitals caring for dementia patients do not have dentists on staff, posting dentists to provide oral risk management would also be important.

CONCLUSION

Hospitalized moderate–severe dementia patients had a high prevalence of oral health conditions that were unnoticed by doctors and ward staff, which may increase risk of incidents and/or accidents.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to report.

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FIGURE LEGEND

Figure 1. Frequencies of participants with dental problems (*n* = 92)

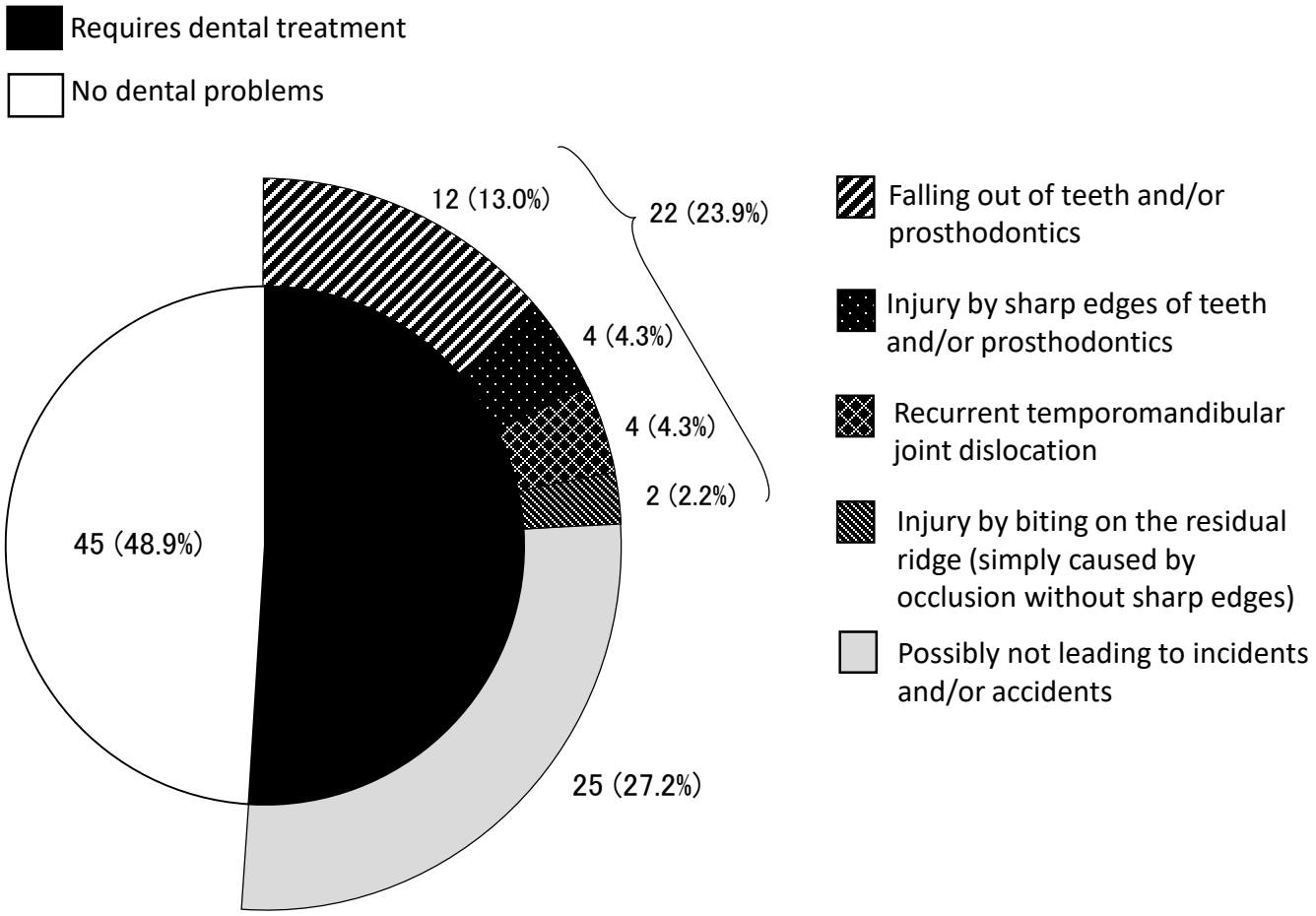
TABLE

Table 1. Details of risk factors that could lead to incidents and/or accidents

	Numbers (%)
Falling out of teeth and/or prosthodontics	12 (54.5)
Injury by sharp edges of teeth and/or prosthodontics	4 (18.2)
Recurrent temporomandibular joint dislocation	4 (18.2)
Injury by biting on residual ridge (caused by occlusion without sharp edges)	2 (9.1)
Total (risk factors that could lead to incidents and/or accidents)	22 (100)

There were no participants with more than one condition at the same time.

Fig. 1


Requires dental treatment
No dental problems
12 (13.0%)
22 (23.9%)
4 (4.3%)
4 (4.3%)
2 (2.2%)
45 (48.9%)
25 (27.2%)
Falling out of teeth and/or prosthodontics
Injury by sharp edges of teeth and/or prosthodontics
Recurrent temporomandibular joint dislocation
Injury by biting on the residual ridge (simply caused by occlusion without sharp edges)
Possibly not leading to incidents and/or accidents