Abstract: Polypharmacy in elderly persons living at home or in a nursing home is an issue. In the field of dentistry, strategies to reduce polypharmacy must be promoted; however, there is insufficient basic data on medications received by elderly persons with dysphagia living at home or in a nursing home. The subjects were 106 elderly persons with dysphagia living at home or in a nursing home. Based on their medical records, the presence of disease and number/type of drugs being administered were investigated. Stroke, dementia, and hypertension were common. The mean number of drugs per person was 6.3 (minimum: 0, maximum: 15). Drugs for digestive ulcers were the most frequently prescribed medication, followed by hypotensive drugs, anti-parkinsonism drugs, and other central nervous drugs. Fifty-nine patients (52.8%) had taken drugs that may cause dysphagia, and 19 (17.9%) had taken drugs that may cause aspiration. Of the subjects, 68.9% had taken ≥5 drugs, demonstrating polypharmacy in elderly persons with dysphagia living at home or in a nursing home. Many drugs that may cause dysphagia or aspiration had been prescribed, suggesting the importance of dentists' reducing polypharmacy from the viewpoint of swallowing.

Keywords: adverse events related to drugs, aspiration, dysphagia, polypharmacy

Introduction

Recently, polypharmacy in the elderly has been emphasized as a worldwide issue. “Polypharmacy” refers to the practice of “taking multiple drugs.” However, this term is sometimes used to refer to the development of adverse events related to the administration of multiple drugs. Elderly persons often develop several diseases owing to increasing age, and the number of drugs to be taken increases when drug therapy is selected as the treatment for these diseases. Furthermore, “prescription abandonment” is a controversial issue. Drugs prescribed for mental symptoms, such as temporary delirium on admission, are continuously prescribed even when there is a change in the residential location, such as home or nursing home. Thus, the number of drugs taken by elderly persons often increases, and the incidence of adverse events, such as falls, increases with an increase in the number of drugs being taken [1]. In order to reduce polypharmacy, the Beers Criteria (revised in 2019) [2] were established in the United States of America and the STOPP/START Criteria [3] were created in Europe. As per these criteria, drugs that require consideration before being administered to elderly persons are presented. In Japan, the Japan Geriatrics Society revised the “Guidelines for safe drug therapy in the elderly” in 2015 and prepared a list of drugs that need to be carefully administered and those for which administration must be considered.

Utilizing these guidelines and criteria, a strategy to review drugs that were being taken at the time of admission and reduce/discontinue unnecessary medication is promoted, involving physicians/pharmacists in hospitals [4]. In contrast, few studies have reported strategies to discourage polypharmacy for elderly persons living at home or in a nursing home. In order to promote these strategies for elderly persons who are cared for by a limited number of health care professionals, in addition to physicians and pharmacists, dentists must handle polypharmacy from a special viewpoint.

To reduce polypharmacy among elderly patients living at home or in a nursing home, dentists and dental hygienists can propose prescription changes or dose-reduction based on findings, such as antiepileptic-drug-related gingival hyperplasia, as an adverse event, and anticholinergic-agent-related dry mouth, or manage drug-induced dysphagia. In Japan, home-visit dental care teams are usually responsible for managing dysphagia in elderly patients living at home or in a nursing home. If dentists can diagnose drug-induced dysphagia and advise the prescribing physicians to change the prescription, there may be health-expenditure-reducing effects through a decrease in the number of drugs being administered. Moreover, if a decrease in the number of drugs improves the swallowing function, it may reduce the health expenditure associated with aspiration or aspiration pneumonia.

In this study, as a preliminary stage of the strategy for discouraging polypharmacy used by dentists, the medications taken by elderly persons living at home or in a nursing home were investigated under home-visit dental treatment for dysphagia.

Materials and Methods

The subjects were patients aged ≥65 years who required nursing care at home or in a nursing home and had received home-visit treatment for dysphagia between April 2015 and March 2019. Thus, the final study population comprised 106 patients (41 men and 65 women), with a mean age of 81.0 years (standard deviation 7.5). Diseases and number/type of drugs prescribed at the initial consultation were recorded from medical records. Tablet, powder, and patch preparations were surveyed, excluding ointments. Patch preparations with topical effects, such as poultices, were excluded. Information about drugs that were taken for ≥2 weeks for symptomatic therapy, such as laxatives and analgesic drugs, was included in the data.

Of the “drugs to be carefully administered” described in the “Guidelines for safe drug therapy in the elderly in 2015” issued by the Japan Geriatrics Society, 11 drug classifications (Table 1) were selected. Symptoms that influence 5 phases of swallowing were presented as “primary adverse reactions,” including cognitive hypofunction, dry mouth, extrapyramidal symptoms, and aspiration, and these drugs were considered “drugs that may cause dysphagia.” Regarding drugs noted for careful administration only in the presence of a specific disease or condition, only subjects in whom the disease or condition was present were included, while those free from the disease/condition were not included in the analyses.

In addition, among these drugs, dopamine antagonists [5] (antipsychotic drugs, antiemetics, and sulpiride) that were reported to directly affect the pharyngeal phase of swallowing, causing aspiration, were included and considered “drugs that may cause aspiration (pharyngeal-phase dysphagia).” For patients taking dopamine antagonists, videofluoroscopic examination (VE) of swallowing was performed to evaluate the presence of aspiration on swallowing 3 mL of liquid.

Before study initiation, the protocol was approved by the ethics review board of the Graduate School of Dentistry, Osaka University (Approval No. H30-E45).
Results

The most prevalent disorder in the subjects was stroke (n = 39), followed by dementia (n = 37), hypertension (n = 31), Parkinson’s syndrome (n = 17), diabetes mellitus (n = 13), heart failure (n = 11), Parkinson’s disease (n = 8), cancer (n = 4), brain tumor (n = 3), hydrocephaly (n = 3), and reflux esophagitis (n = 3) (duplicated patients are included).

The mean number of drugs per person was 6.3 (minimum: 0, maximum: 15) (Fig. 1). Total 73 subjects (68.9%) were prescribed ≥5 drugs and fulfilled the criterion for polypharmacy.

According to this survey, the total number of drugs taken by 106 patients was 655. Of these, the highest number of drugs was taken for digestive ulcers (n = 106) as per drug-efficacy classification, followed by that for hypertension (n = 63), Parkinson disease (n = 44), and other central nervous system disorders, including dementia (n = 3) (duplicated patients are included).

The mean number of drugs per person was 6.3 (minimum: 0, maximum: 15) (Fig. 1). Total 73 subjects (68.9%) were prescribed ≥5 drugs and fulfilled the criterion for polypharmacy.

According to this survey, the total number of drugs taken by 106 patients was 655. Of these, the highest number of drugs was taken for digestive ulcers (n = 106) as per drug-efficacy classification, followed by that for hypertension (n = 63), Parkinson disease (n = 44), and other central nervous system disorders, including dementia (n = 3) (duplicated patients are included).

The others included anticoagulants/platelet aggregation inhibitors (n = 30), anti-diarrhea/intestinal drugs (n = 25), purgatives/clysters (n = 25), and anxiolytic drugs/sleep-inducing sedatives (n = 24).

Fifty-nine patients (52.8%) had taken 11 types of drugs that may cause dysphagia (Table 1). Of the 11 types, benzodiazepines were the most frequently prescribed (17 patients, 16.0%).

Nineteen patients (17.9%) had taken antipsychotic drugs, antiemetics, or sulpirides with anti-dopamine activity (Table 1). VE could be performed to evaluate the swallowing function in 14 (13.2%) patients; aspiration occurred on swallowing in 5 (4.7%) patients. In 3 (2.8%) of these patients, there was no disease that may have caused dysphagia, suggesting drug-induced aspiration. In these 3 patients, the prescription of dopamine antagonists was discontinued after consultation with the prescribing physicians. One month thereafter, there was no aspiration on VE.

Discussion

Of the subjects, 68.9% had taken ≥5 drugs. This rate was higher than that from a survey involving acute-phase inpatients [6,7]. Previous studies have defined the administration of ≥5 drugs as “polypharmacy”; polypharmacy was noted in approximately 70% of elderly patients with dysphagia who were living at home or in a nursing home.

Regarding the content of the medication, the most common prescriptions comprised drugs for digestive ulcers, digestants, and antacids, indicating that many elderly persons had gastrointestinal abnormalities. For some patients, these drugs had been prescribed in combination with drugs that influence the digestive tract, such as analgesic drugs. An additional drug may have been prescribed to inhibit adverse reactions to other drugs, causing an increase in the number of drugs being administered.

This study involved patients with dysphagia; thus, some patients had taken ACE inhibitors, amantadine, or cilostazol, that reportedly improved their swallowing function. Polypharmacy is clinically controversial; however, necessary drugs should be prescribed. In patients taking these drugs, polypharmacy may have been clinically necessary.

Drugs that may cause dysphagia were prescribed for 47 patients (44.3%). These drugs can induce adverse events, such as cognitive hypofunction, dry mouth, and extrapyramidal symptoms [8,9], causing dysphagia. Stroke and dementia were present among several subjects of the present study. Therefore, disease-related dysphagia may have developed; however, these
drugs may have aggravated the dysphagia.

Nineteen patients had taken dopamine antagonists that induce aspiration, and three were suspected of having drug-induced aspiration as an adverse event. It is rational to continuously prescribe drugs to patients who do not exhibit any adverse events and require the drug treatment, even if the drugs are on the list of “drugs requiring careful administration.” However, as demonstrated by this survey, among elderly dysphagia patients living at home or in a nursing home, some patients were suspected to have drug-induced aspiration as an adverse event. This suggests that it is necessary for dentists to find such patients and propose prescription changes or discontinuation while presenting the swallowing findings to the prescribing physicians. For these 3 patients, drug discontinuation improved their swallowing function, suggesting the significance of dentists’ strategies against polypharmacy for patients with dysphagia.

In the field of dentistry, adverse events related to drugs, such as necrosis of the jaw related to bisphosphonate preparations and dry mouth related to anticholinergic drugs, may be observed. Drug-induced dysphagia, as investigated in this survey, is another drug-related adverse event. Dentists should confirm the content of medication and review prescription changes/discontinuation with the prescribing physicians while presenting the clinical findings of patients with necrosis of the jaw or dry mouth. Furthermore, it is necessary for dentists to establish a close relationship with the prescribing physicians when treating patients with drug-induced dysphagia. This survey clarified the percentage of elderly patients living at home or in a nursing home who had dysphagia and were taking drugs that may cause dysphagia or aspiration; the findings provide basic data for future strategies to discourage polypharmacy in the field of dentistry.

Acknowledgment
This study was supported by a subsidy from the Yuumi Memorial Foundation for Home Health Care. The authors thank this foundation.

Conflict of interest
None declared.

References