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Questionnaire Survey for Bronchial Asthma in Elderly Care Facilities

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In developed countries such as North America, the decline in mortality from bronchial asthma has ceased since 2006. The decline in mortality rate is also decreasing in Japan, where about 1,500 asthma deaths have been reported. Among these, elderly people aged 65 years or over account for about 90% of cases. Therefore, the treatment of elderly patients with asthma is an important subject. However, few studies have been conducted on asthma in elderly patients. In this survey, we distributed a questionnaire to 253 elderly care facilities in Kobe, Japan. Ninety facilities responded, and 223 patients in 70 out of 90 facilities were diagnosed with asthma. Dry powder inhaler was the most commonly used dosage form of inhaled corticosteroids. Many facilities have patients who need some assistance during inhalation: only 60% of facilities reported that inhalation is performed accurately. While 31 facilities had patients with a history of hospitalization for asthma attacks, only 14 of these facilities were able to provide appropriate initial treatment. Many facilities have difficulty providing assistance with inhalation to elderly patients whose cognitive function has deteriorated. This survey highlights challenges experienced by care facilities in treating asthma in the elderly.

INTRODUCTION

Recent studies have shown that the prevalence of asthma in elderly people aged over 65 years in North America and Europe is similar to that in younger age groups, and ranges from 1.8% to 10.9%, with a slightly increasing trend [1]. In general, if the patient has no symptoms, it is difficult to diagnose asthma. In addition, asthma in older individuals is often complicated by chronic obstructive pulmonary disease (COPD) and is associated with neutrophilic airway inflammation [2]. The complication of COPD makes the diagnosis of asthma difficult. A cohort study of 4,581 subjects in the United States demonstrated that approximately half of elderly asthma is underdiagnosed, resulting in under-treatment with inhaled corticosteroids (ICSs) [3]. In Italy, a clinical survey of 1,223 ambulatory patients aged over 65 years, including 210 asthmatics, showed that the mortality rate was 16.3% in the control group, whereas among the asthma patients, the mortality rate was 24.3% [4]. In Australia, two-thirds of deaths due to asthma occur in elderly patients aged over 65 years [5].

In Japan, the total number of deaths due to asthma has decreased to about 1,500, and about 90% of asthma death occurs in elderly patients over 65 years. Although medical treatment, especially ICS therapy, is particularly important for the control of bronchial asthma, problems unique to the elderly, such as physical disability and dementia, make it difficult to control bronchial asthma by ICSs. Currently, about 900,000 elderly people resident in elderly care facilities in Japan. To the best of our knowledge, no survey of asthma among elderly people in elderly care facilities has been conducted to date.

MATERIALS AND METHODS

Study design

From July 2013 to August 2013, we distributed a questionnaire about asthma to 253 elderly care facilities located in Kobe City by post. We asked the representatives of each facility to respond to the questionnaire and return it to us by fax. The questions asked in the questionnaire are shown in Table I.

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Table I. Questionnaire

Q1	How many residents are there?
Q2	How many residents have been diagnosed with asthma?
Q3	How many residents have been diagnosed with COPD (emphysema, chronic bronchitis) among all residents with asthma?
Q4	How many residents with asthma are currently treated for asthma?
Q5	Where are the residents treated for asthma? ☐ Your facility ☐ Hospital/clinic ☐ Other
Q6	How many ICSs are used for treatment of residents with asthma?
Q7	How many residents are treated for asthma with the following ICSs? ☐ Dry powder inhaler ☐ Metered dose inhaler ☐ Metered dose inhaler with spacer ☐ Nebulizer
Q8	How many residents need assistance for using ICs?
Q9	Do residents use ICSs appropriately? ☐ Correct ☐ Sometimes correct ☐ Unable ☐ I do not know
Q10	Have you taught inhalation at your facility? ☐ Always ☐ Sometimes ☐ Rare
Q11	Who is teaching inhalation at your facility? ☐ Doctor ☐ Pharmacist ☐ Nurse ☐ Other
Q12	How do you treat asthma attacks? ☐ Medication therapy such as β stimulant ☐ Introduction to hospital/clinic ☐ Other
Q13	Have residents ever needed an emergency visit or hospitalization for an asthma attack? ☐ Yes $\rightarrow$ __ in recent years ☐ No
Q14	Have you experienced asthma-related death within the last 5 years? ☐ Yes $\rightarrow$ __ people ☐ No
Q15	Would you like to participate in a workshop on teaching correct inhalation technique? ☐ I want to participate ☐ I do not want to participate
Q16	Please let me know if you have any difficulties related to asthma treatment in the elderly.

chronic obstructive lung disease, COPD; inhaled corticosteroids, ICSs

Diagnosis and treatment of "asthma", "asthma attack", "asthma-related death" and "COPD", and the proportion of patients in each facility were assessed by the family doctor and the doctors of each facility. This survey was approved by the Institutional Review Board of Kobe University Hospital (permission number, 160157).

Data analysis

The data were entered by a pair of investigators into a pre-constructed excel-data sheet. The entering of data was checked by two authors at random, and for plausibility, during descriptive data analysis.

RESULTS

Study participants (Q1 to Q5)

Responses were obtained from 93 facilities; among them, 90 facilities (97%) submitted valid responses. Ninety elderly facilities included 36 nursing homes for the elderly, 24 nursing homes, 21 long term care health facilities, 9 nursing care centers. The nursing home for the elderly is a facility for the elderly who needs nursing care, assistance, health care, functional training and is operated by social welfare corporation. At least one doctor and nurses are working the facility. The nursing home is a facility for those who are over 65 years old and who have difficulty in daily life at home because of physical, mental or economic reasons. The long term care health facility is a facility to support the independence of elderly people who need nursing care and doctors and nurses are working. The nursing care center is a facility for person over 60 years old who can do personal things by itself, but who has concerns about self-sustained daily life or who is difficult to live with its family. The total number of residents in these 90 facilities was 5685, among which 223 (3.9%) residents in 70 facilities were diagnosed with asthma. Of 223 asthma residents, 158 (71%) were diagnosed with COPD. Of these 223 asthmatics, 150 (67%) continued to receive asthma treatment (Fig. 1).

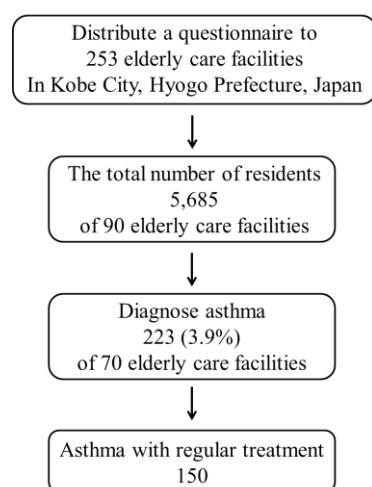


Fig. 1. Process for the selection of study subjects

The respondents were nurses (63%), care staff (18%), doctors who mainly work in clinics or hospitals (9%), facility directors who mainly work in facility (9%), and pharmacists (1%). The number of asthma residents per facility was up to 2 (median 2 residents) (Fig. 2).

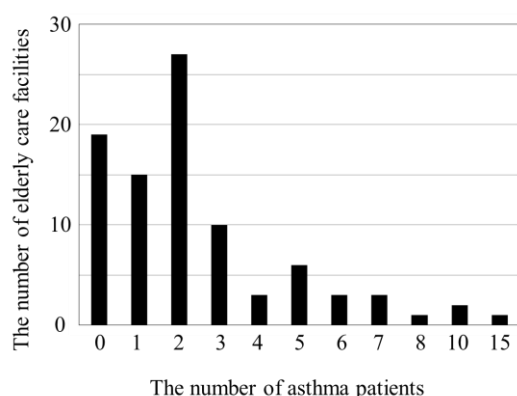


Fig. 2. The number of asthma patients in each elderly care facility
The number of asthma patients in each facility varied widely

These asthma residents were treated at their facilities (61%), hospitals/clinics (36%), or other medical institutions (3%).

Usage of ICSs (Q6 to Q11)

ICSs were used by 125 residents, representing 56% of the elderly residents diagnosed with asthma. The inhalation devices used were mainly dry powder inhalers (59%), followed by metered dose inhalers (34%). The use of spacers and nebulizers was rare (Fig. 3). The medical examination of patients with asthma was mainly performed at the respective elderly care facility (60%) and at hospital/clinics (29%).

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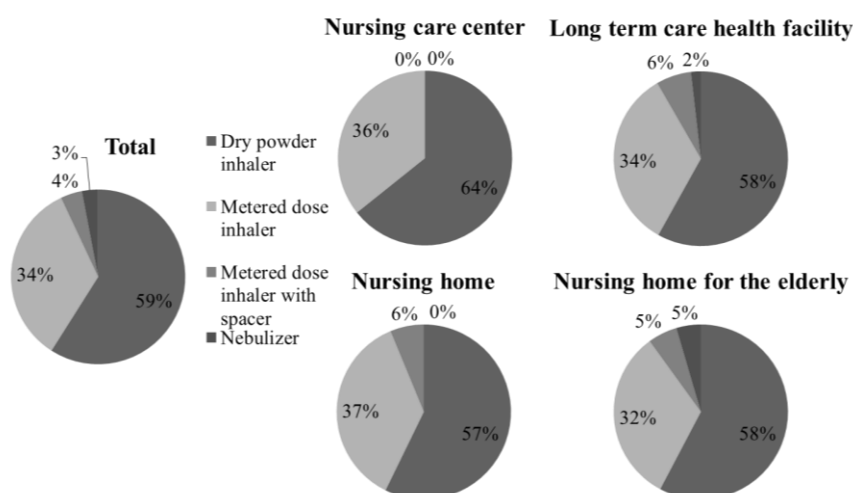


Fig. 3. Device selection for ICSs

Numerous residents with asthma were treated with inhaled corticosteroids (ICSs). Dry powder inhaler was the most commonly prescribed ICS device owing to its ease of use.

Among the elderly care facilities surveyed, 43% facilities assisted all elderly residents with ICS use, Together with the 7% of facilities that assisted almost all elderly residents when they used ICSs, almost half of the facilities considered the need to assist elderly asthma patients with inhalation. On the other hand, only 40% of facilities responded to state that there were no residents who needed assistance (Fig. 4). Inhalation assistance was most needed in the nursing home for the elderly and the need was somewhat lower in the nursing home.

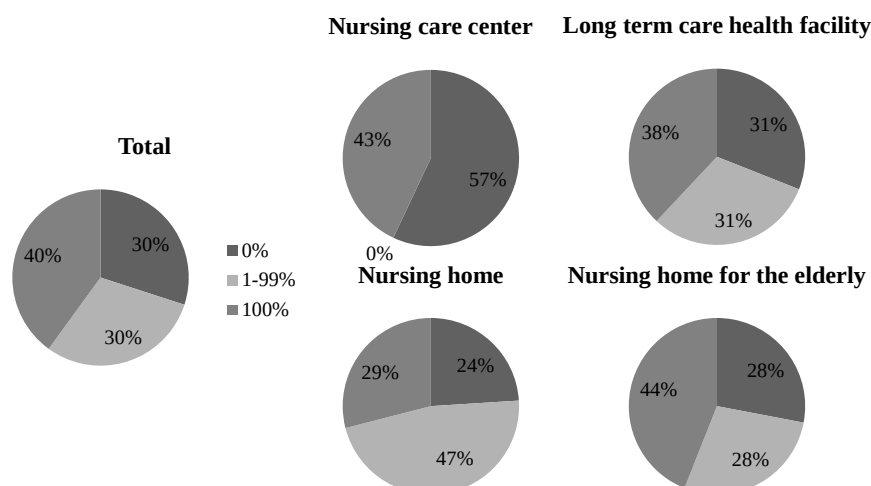


Fig. 4. The percentage of patients needing assistance from caregivers with ICS inhalation.

Although the percentage of asthma patients needing assistance from caregivers varies widely, many patients needed assistance to use their inhalers.

In addition, in response to the question, “Do residents use ICSs appropriately?” 60% of the institutions confirmed correct use, and 20% of them answered that ICSs were sometimes used correctly, and the remaining 20% of the facilities states that ICSs were incorrectly used. In other words, 40% of the facilities reported that elderly residents did not use ICSs correctly (Fig. 5).

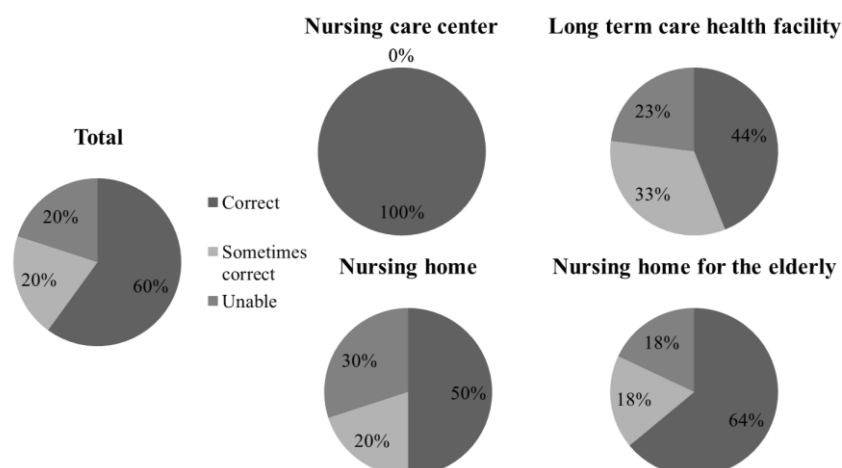


Fig. 5. The number of facilities with proper ICS usage by patients.

There were patients who were unable to follow all ICS inhalation steps correctly in many elderly care facilities except for nursing care center.

In response to the question, “Have you taught correct inhalation technique at your facility?” 18% of the facilities responded “always”, 42% of them answered “sometimes”, and 40% answered “rarely”. In the majority of cases (85%), nurses taught correct inhalation procedure.

Primary care of asthma (Q12 to Q14)

Thirty-one facilities reported that elderly residents had experienced asthma attacks. In regard to primary care for asthma attacks, 14 facilities responded that they used short-acting β -stimulants, and 6 facilities reported that patients were taken to a neighboring hospital or clinic for treatment. Eleven facilities answered “other”. Only one facility experienced one asthma death over the previous 5 years.

Others (Q15 and Q16)

Fifty-four facilities reported that they want to participate in a workshop on teaching correct inhalation technique. Most facilities considered that the difficulties with inhalation experienced by elderly people whose cognitive function had declined posed a challenge to treatment. Many responses stated that it was not possible to use the dry powder inhaler accurately. Others expressed the view that inhaled medicines are too expensive to use in elderly care facilities, and that they did not know how to deal with asthmatic attacks.

DISCUSSION

This questionnaire survey revealed that the proportion of elderly people in elderly care facilities with a diagnosis of asthma was 3.9%. A previous study in Japan reported that the percentage of adults who were diagnosed with asthma by a doctor was 4.2%. In the age range of 60 to 79 years old, the percentage diagnosed with asthma was 3.4% to 5.2% [6], which was almost the same as that in the current study. The study revealed that many asthma patients are diagnosed as having COPD because the prevalence of asthma-COPD overlap syndrome was reported to range from 13.3% to 61.0% [7]. In this survey, the percentage of residents who continue receiving asthma therapy was 67%; this was much higher than the proportion (22.0%) that was previously reported in Japan [8]. This is partly because, in the elderly care facilities in Kobe, ICSs are utilized appropriately as a result of efforts to teach general practice physicians and pharmacist how to use them.

In addition, in 40% of facilities, the inhalation procedure was evaluated as incorrect; additionally, many facilities believed that some kind of assistance is needed for inhalation (79%). These findings may be attributed to decreased physical ability, which is a problem specific to the elderly, and difficulty in learning new procedures. In particular, the problem of cognitive deterioration was identified by facility staff as the main challenge to inhalation treatment.

The most commonly used inhalation device is the dry powder inhaler, followed by the metered dose inhaler; these devices accounted for the majority (93%) of inhalation devices used. It is reported that elderly patients, over 70 years old, find the metered dose inhaler difficult to use [9]. Indeed, there were many opinions that it is very difficult to adequately conduct inhalation using devices in which the timing of respiration must be adjusted, such as the metered dose inhaler. However, in the present study, only a few facilities were found to use the spacer and make substantial effort to ensure ease of inhalation. Elderly patients have their own unique problems, and it is necessary to select a device that is appropriate for the specific patient. Further education regarding inhalation by respiratory specialists and pharmacists, appropriate device selection, and suitable inhalation procedure and assistance are considered necessary in this context. Indeed, previous analysis of 216 Japanese elder patients revealed that educating at least three times reduced the inhalation mistakes from 59% to 6% [10].

In regard to primary care for asthma attacks, primary care is often not received within sufficient time following the asthma attack and there are many cases of death occurring within hours after the attack [11]. In order to prevent asthma deaths, it is important to administer treatment in a timely manner following the attack. However, elderly care facilities in which doctors are always present to administer treatment for such attacks are rare; therefore, it is necessary to educate staff other than doctors to enable them to administer appropriate care to patients in the event of asthma attacks. It should be noted, however, that, according to the present survey, only one facility experienced one asthma death. This is partly because the main cause of death in elderly care facilities is recorded as infection [12], and about half of asthma deaths occur in hospitals [11].

It is also difficult to continue treatment of asthma in the elderly. It is reported that 40% of elderly patients were not prescribed ICSs after discharge, despite hospitalization due to asthma attacks [13]. One of the reasons for this is the problem of cognitive deterioration in the elderly; the other is the problem of continuation of ICS treatment, which depends on whether the prescribing physician is a specialist [13]. In facilities that responded to our questionnaire survey, asthma treatment was continued as a result of support from the facility staff. The peak flow is reported to rise by about 15% when assistance with inhalation is provided [14, 15]. It is therefore very important for the elderly to have a caregiver that is able to provide assistance with asthma treatment. If elderlies

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cannot use the dry powder inhaler well because of their insufficient inspiratory flow rate, they are recommended to change to nebulized inhaled corticosteroid or metered dose inhaler with a spacer that does not need to synchronize inspiration [16]. Interestingly, dry powder inhaler was slightly less used in the facility where facility doctor is full time and many facility doctors recognized that ICSs were not properly used.

However, in this survey, diagnosis and treatment of asthma and COPD were performed by the family doctor who mainly works in clinics, doctors responsible for each facility, and the doctor in charge at the time of consultation. Therefore, it is also incumbent on the doctor to perform appropriate clinical examination, and the possibility that this is being overestimated or undervalued cannot be excluded.

In conclusion, even at elderly care facilities, treatment of asthma involved dedicated assistance from facility staff. However, knowledge regarding the use of proper inhaled devices was not sufficiently widespread, and many facilities still require training related to the provision of primary care for asthma attacks.

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