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Current Status and Risk Management for Serious Cases of Bronchial Asthma Treatment

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Asthmatic deaths have been gradually reduced since 1998 when regular steroid inhalation therapy was proved effective and widely introduced as guideline therapy. There were, however, still as many as 4,473 Japanese people who died of asthma in 2000. We examined the reasons for this large number of deaths, despite establishment of the guideline therapy, by investigating emergency patients who were carried to our emergency care center by ambulance as tertiary emergency cases for treatment of serious asthma. The investigation of medications used before emergency arrival showed that patients were not treated according to the guideline therapy: 92.9% of all patients and 100% of CPA (cardio pulmonary arrest) patients were treated with β-receptor stimulators (spray) only when they had asthmatic fits, and regular steroid inhalation therapy was performed on only 2 patients (3.7%). Although respiratory and allergy experts specializing in bronchial asthma follow the guideline therapy, it may not be widespread among general clinicians. To reduce the deaths from bronchial asthma, it is important to fully manage the possible risks of bronchial asthma by making general practitioners give patients full information on the disease; making patients strictly follow the appropriate hospital visit and treatment schedule based on regular steroid inhalation therapy; instructing patients to always carry their medical history cards for sudden attacks of bronchial asthma; and persuading emergency care centers to permit over-triaging by ambulance teams.

Key words: asthmatic death, bronchial asthma treatment, regular steroid inhalation therapy, CPA (cardio pulmonary arrest), risk management

Introduction

Asthmatic deaths have been gradually reduced since 1998 when regular steroid inhalation therapy was proved effective and widely introduced as guideline therapy (Fig. 1)[1)2)]. There were, however, still as many as 4,473 Japanese people who died of asthma in 2000[2)]. We examined the reasons for this large number of deaths, despite establishment of the guideline therapy, by investigating emergency patients who were carried to our emergency care center by ambulance as tertiary emergency cases for treatment

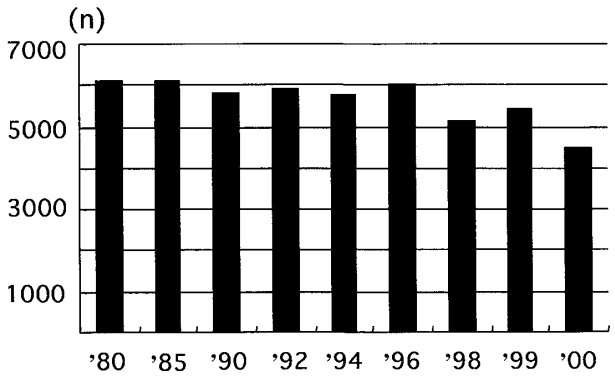

Fig. 1 Change in the number of deaths by bronchial asthma over years
Guidelines for Diagnosis and Treatment of Adult and Childhood Asthma: JGL 1998[1].
Ministry of Health, Labour and Welfare: Vital Statistics of Japan 2000 [2].

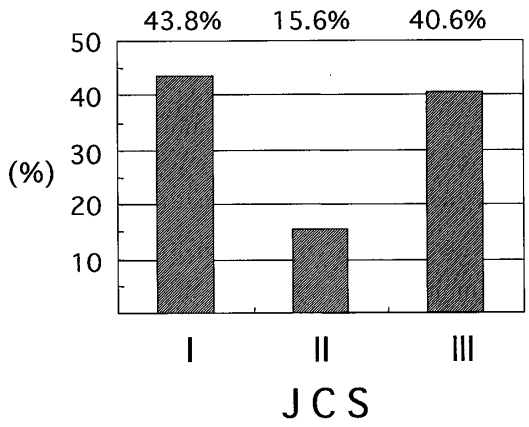

Fig. 2 The consciousness level-on arrival (non-CPA, n; 32).

of serious asthma.

Subjects and Methods

Fifty-four patients with serious bronchial asthma who were carried to our emergency care center by ambulance as tertiary emergency cases from June 1998 to August 2002 were retrospectively examined.

Results

All 32 non-CPA (cardio pulmonary arrest) patients could be saved, which was a life saving rate of 100%, while 18 of 22 patients with CPA could not be saved. Eight died at the emergency center and ten died after hospitalization, a life saving rate of 18.2%. Two of the 4 CPA survivors were discharged without assistance, and the remaining 2 were transferred to other hospitals. The 54 patients consisted of 29 males and 25 females who were from 12 to 86 years old. The mean age in non-CPA patients was 49.8 years and that in CPA patients was 60.3 years. For emergency arrivals by ambulance, 39 patients (72%) had limited consciousness or dyspnea at home or outdoors and arrived due to our hot line, while 15 (28%) were referred from other departments or hospitals.

The consciousness level of non-CPA patients evaluated by the ambulance teams showed 18 patients (56%) had a severe lack of consciousness from Japan Coma Scale (JCS) II to III. This indicates that it was difficult for the ambulance teams to triage patients because they could not ask the patients for their medical histories (Fig. 2). The non-CPA and CPA patients attended hospitals for treatment for bronchial asthma for mean periods of 14.2 and 12.8 years.

The investigation of medications used before emergency arrival showed that patients were not treated according to the guideline therapy: 92.9% of all patients and 100% of CPA patients were treated with β-receptor stimulators (spray) only when they had asthmatic fits, and regular steroid inhalation therapy was performed on only 2 patients (3.7%) (Fig. 3).

In the ICU, 13 of the 32 non-CPA patients (40.6 %) could not be treated with general therapies including drip infusions of drugs, inhalation therapy, and pulmonary physical therapy (expiration assistance therapy) and therefore required endotracheal intubation. Artificial respirators PCV (pressure contole ventilation) and spacers for them were combined (for steroid/β-stimulant inhalation therapy) in these 13 patients. The results showed that they were useful in controlling airway pressure from the early stage of the treatment.

Discussion

Bronchial asthma is characterized by airway inflammation and reversible airway stenosis[3)~5)]. The NIH guidelines for diagnosing and treating bronchial asthma propose deciding a specific zone of peak flow value for at-home asthma control[1)6)]. Peak flow monitoring is useful for determining the severity of bronchial asthma and making therapeutic policy. This is because even general practitioners without devices for special examinations can objectively understand the status of the airway stenosis by the values and because peak flow values have been considered to serve as an objective index of bronchial asthma.

Asthmatic treatment should be designed to control symptoms immediately and to prevent remodeling and suppress its progress. Therefore, it is necessary to perform pharmacotherapy with drugs with anti-inflammatory effects as early as possible before asthmatic symptoms get severer. Since steroid inhalation therapy now shows the most effective anti-inflammatory effects on the airway, it is important to start therapy at appropriate dose levels as early as possible to treat asthma[7)~10)].

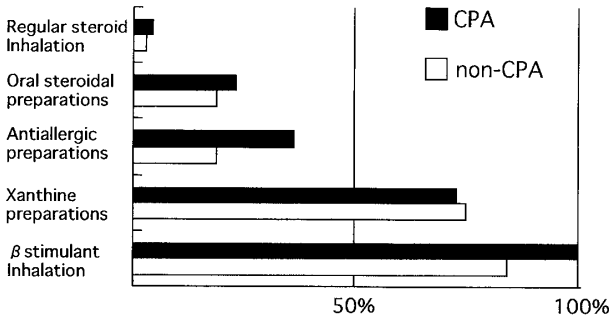

Fig. 3 For medication before emergency arrival

The present examination showed that almost no patients received treatments that strictly followed the guideline therapy, suggesting that neither physicians nor patients understand asthma well. Although respiratory and allergy experts specializing in bronchial asthma follow the guideline therapy, it may not be widespread among general clinicians. Further, there are cases where patients, not clinicians, decide to use a β-receptor stimulator (spray) because it can be used only when asthmatic fits develop without needing regular hospital visits. This may lead to asthmatic deaths.

Factors associated with asthmatic death on the patient side include poor knowledge of asthma, negligence in symptoms, failure to receive medical treatment soon after symptoms develop, failure to regularly receive medical treatment, and non-compliance with physician's instructions. Those on the physician's side include failure to give patients sufficient information on the dis-

Table 1 Dyspnea; the symptom for severe case

Cyanosis
Orthopnea
Labored ventilatory movement with remarkable wheezing
Chest pain
Hemoptysis
Remarkable edema
Unequal breath sound
Moist rales・Dry rales in evtensive lung area
Bronchial asthma atacking
Dialysis
Myocardial infarction, Valvular heart disease, Cardiomyopathy

(Tokyo Fire Department)

ease, negligence of home doctors (failure to strictly perform appropriate treatments such as regular steroid inhalation therapy and peak flow measurement), and poor or delayed emergency care.

The Metropolitan Fire Department uses a disease observation card containing the definition of serious dyspnea for triage. Considering that performing differential diagnoses are difficult because many patients have limited consciousness, it is necessary for emergency care centers to permit over-triage by ambulance teams when patients are suspected to have serious asthma (Table).

Conclusions

Patients who arrive at our center as tertiary emergency cases for treatment of serious asthma have not been treated with the guideline therapy. This may explain the large number of asthmatic deaths.

To reduce the deaths from bronchial asthma, it is important to fully manage the possible risks of bronchial asthma by making general practitioners give patients full information on the disease; making patients strictly follow the appropriate hospital visit and treatment schedule based on regular steroid inhalation therapy; instructing patients to always carry their medical history cards for sudden attacks of bronchial asthma; and persuading emergency care centers to permit over-triaging by ambulance teams.

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重症例からみた気管支喘息治療の現状と危機管理に関する検討

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1998年よりステロイド剤規則的吸入療法を主体としたガイドライン療法が導入され喘息死は徐々に減少してきたが，2000年度の本邦における喘息死は4,473名を数える．標準的治療が確立されたにもかかわらずなぜ死亡例が多いのかを，救命救急センターに3次救急搬送された重症気管支喘息患者54例を対象に検討した．救急搬送前の投薬内容をみると，ガイドラインにそった治療は行われず，喘息発作時だけβ受容体刺激剤（スプレー）を使用していた症例が平均92.9%でCPA（cardio pulmonary arrest）症例では100%であった．それに対してステロイド剤規則的吸入療法は2例3.7%にしか行われていなかった．気管支喘息を専門とする呼吸器専門医やアレルギー専門医はガイドラインにそった治療を行っているが，一般臨床医には未だ浸透していない可能性が示唆された．気管支喘息死を減少させるには，一般臨床医による患者教育の徹底，ステロイド剤規則的吸入療法をベースにした適切な定期的通院・治療の厳守，発作急変時に備えた病歴カードの常時携帯，救急医療機関側は救急隊のオーバートリアージを容認するなど危機管理の徹底を図ることが重要と考えられた．