

Present State and Problems of Asthma Treatment in Japan

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Introduction

The treatment and management of asthma in Japan have made remarkable progress in the past 10–15 years. The objective evidence of this progress is clearly seen in the decrease in deaths from asthma and the decrease in hospital admissions for asthmatic attacks, which have been supported by the development of the Japanese guidelines for the treatment and management of asthma, first published in 1993 and periodically revised thereafter incorporating up-to-date information. The following outlines the situation of asthma in Japan.

Prevalence Rate of Asthma (Fig. 1)

The prevalence rate of asthma among elementary school children (age 6–12), assessed in the same geographical area using the same method, has increased 2.1 times in 20 years from 3.17% (3.83% for males and 2.49% for females; 55,388 subjects) in 1982 to 4.58% (5.61% for males and 3.53% for females; 45,674 subjects) in 1992 to 6.14% (7.59% for males and 4.66% for females; 36,228 subjects) in 2002 (Fig. 1).¹ The data for asthma symptoms in Japan from the International Study of Asthma and Allergies in Childhood (ISAAC) show that the prevalence in the 6–7 year age group increased from 17.3% in 1995 to 17.9% in 2002, and that in the 13–14 year age group decreased from 13.4% in 1995 to 13.0% in 2002.²

Trends in Asthma Mortality (Fig. 2)

Japan experienced two epidemics of deaths from asthma, one in the 1960s and the other from the

late 1980s to the early 1990s. Later, the rates decreased rapidly, as the focus on asthma treatment shifted from the treatment of asthma attacks to long-term control to prevent or reduce attacks. The mortality rate in 2006 was 0.15 per 100,000 in the 5–34 year age group population (Fig. 2). While it was 0.04 among children (age 5–14), 5 to 8 deaths are recorded annually in the 0–4 year age group. In 2006, 2,770 persons at all ages died from asthma (cf. the total population of Japan: 126,154,000), including 2,376 persons (86%) aged 65 or older. We still need to address the difficulty in the diagnosis and treatment of asthma at ages from 0 to 4 years, as well as the complication with chronic obstructive pulmonary disease (COPD) and the difficulty in differential diagnosis at ages above 65.³

Long-term Control of Asthma (Table 1)

The therapy for the long-term control of asthma is composed basically of using inhaled corticosteroid (ICS) as the first-choice drug. Because the patients in Japan tend to prefer oral medications and transdermal patches to inhaled agents, leukotriene receptor antagonist (LTRA) is often used in combination with ICS, or used singly in intermittent to mild persistent asthma.

The regimens for children are defined for the 3 age groups of infants (age 0–1), toddlers (age 2–5), and schoolchildren (age 6–15), while those for adults are not subdivided into further age groups. The Japanese guidelines, as compared with GINA⁴ and EPR-3,⁵ are characterized by the preferred use of SRT in adults and LTRA in children, as well as the approximately 50% reduced dose of ICS in children and the use of patched β_2 agonists in infants and toddlers.⁶

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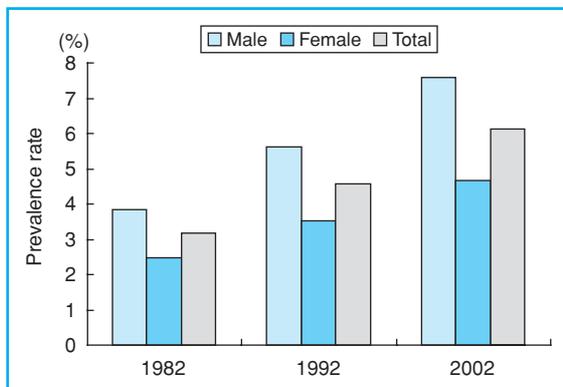


Fig. 1 Prevalence rate of bronchial asthma in Western Japan in 1982, 1992 and 2002

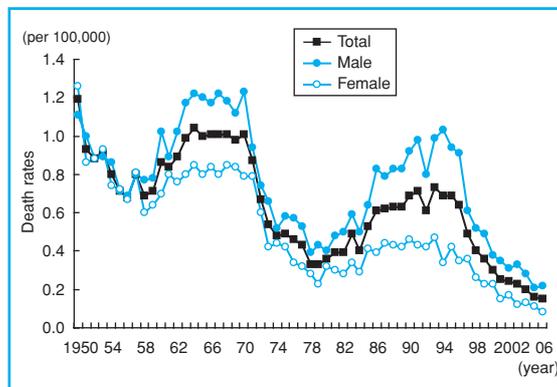


Fig. 2 Asthma mortality in the 5-34 age group in Japan during 1950-2006

Table 1-1 Recommended medication by level of severity: adults

Level of severity	Daily controller medications	Other treatment options
Step 1 Intermittent		ICS (low dose) or SRT or LTRA or DSCG
Step 2 Mild persistent	ICS (low dose)	+ SRT or LTRA or LABA
Step 3 Moderate persistent	ICS (medium dose) + SRT and/or LTRA and/or LABA	
Step 4 Severe persistent	ICS (high dose) + SRT and LTRA and LABA	Steroids (oral)

ICS: inhaled corticosteroid, SRT: sustained release theophylline, LTRA: leukotriene receptor antagonist, LABA: long acting β agonist, DSCG: disodium cromoglycate.

Table 1-2 Recommended medication by level of severity: child (2-5ys, 6-15ys)

Level of severity	Daily controller medications	Other treatment options
Step 1 Intermittent		DSCG or LTRA
Step 2 Mild Persistent	LTRA or DSCG or ICS (low dose)	+ SRT
Step 3 Moderate persistent	ICS (medium dose)	+ LTRA and/or DSCG and/or SRT and/or LABA
Step 4 Severe persistent	ICS (high dose) + LTRA and/or LABA and/or DSCG and/or SRT	Steroids (oral)

ICS: inhaled corticosteroid, SRT: sustained release theophylline, LTRA: leukotriene receptor antagonist, LABA: long acting β agonist, DSCG: disodium cromoglycate.

Table 1-3 Recommended medication by level of severity: child (0–1 ys)

Level of severity	Daily controller medications	Other treatment options
Step 1 Intermittent		DSCG or LTRA
Step 2 Mild persistent	DSCG or LTRA	ICS (low dose)
Step 3 Moderate persistent	ICS (low dose)	+ LTRA and/or DSCG and/or LABA (patched) and/or SRT
Step 4 Severe persistent	ICS (medium dose) and LTRA and/or DSCG	+ LABA (patch or oral) + SRT

ICS: inhaled corticosteroid, SRT: sustained release theophylline, LTRA: leukotriene receptor antagonist, LABA: long acting β agonist, DSCG: disodium cromoglycate.

Treatment for Acute Attacks (Table 2)

The basic treatment for asthma attacks is the inhalation of β agonists, and this inhalation may be repeated unlimitedly if the symptom does not improve. Patients with moderate attacks should visit a hospital. At the hospital, So_2 is measured using a pulse oximeter in the case of children, and those showing a level below 95% of So_2 are treated with oxygen inhalation. The patients who do not improve with SABA are treated with drip infusion of steroids and theophylline. Subcutaneous adrenaline injection is used in some adult cases.

Severe attacks generally require hospitalized care, which may include increased-dose steroids and frequent SABA inhalation. Children are often treated with isoproterenol drip infusion under heart rate and So_2 monitoring. The patient developing respiratory failure may require intratracheal intubation, assisted ventilation, mechanical ventilation, sedation, etc. in the intensive care unit of the hospital.

Table 2 Management of asthma exacerbation

Symptom or severity of the exacerbation	Age		
	Infant (0–1 ys)	Child (2–15 ys)	Adult (15 ys–)
Mild attack	SABA	SABA	SABA theophylline (p.o)
Moderate attack	SABA O_2 inh. ($SpO_2 < 95\%$) steroid (i.v)* theophylline (d.i)* (Hospital Care)*	SABA O_2 inh. ($SpO_2 < 95\%$) steroid (i.v)* theophylline (d.i)*	SABA adrenaline (s.i) theophylline (d.i) steroid (d.i) O_2 inh. anti-cholinergics (inh)*
Severe attack	Hopital SABA O_2 inh. hydration steroid (i.v) theophylline (d.i)* isoproterenol (d.i)*	Hopital SABA O_2 inh. hydration steroid (i.v) theophylline (d.i) isoproterenol (d.i)*	Hopital adrenaline (s.i) theophylline (d.i) steroid (d.i) O_2 inh. SABA
Respiratory failure	Emergency Dep. isoproterenol (d.i) SABA (inh.) O_2 inh. hydration steroid (i.v) theophylline (d.i)* mechanical ventilation*	Emergency Dep. isoproterenol (d.i) O_2 inh. hydration steroid (i.v) theophylline (d.i) mechanical ventilation*	Emergency Dep. + intubation or mechanical ventilation

SABA: short acting β agonist, inh: inhalation, i.v: intravenous infusion, d.i: drip infusion, s.i: subcutaneous injection, *: considered.

References

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