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ORIGINAL ARTICLE

# Survey of asthma control in Thailand

WATCHARA BOONSAWAT,[1] POONKASEM CHAROENPHAN,[2] SUMALEE KIATBOONSRI,[2] SOMKIAT WONGTIM,[3] VILAIWAN VIRIYACHAIYO,[4] CHAICHARN POTHIRAT[5] AND NIKOM THANOMSIENG[6]

[1]*Department of Medicine, Khon Kaen University,* [2]*Department of Medicine, Ramathibodi Hospital,* [3]*Department of Medicine, Chulalongkorn University,* [4]*Department of Medicine, Songkhla Nakarin University,* [5]*Department of Medicine, Chiang Mai University and* [6]*Faculty of Public Health, Khon Kaen University, Thailand*

**Survey of asthma control in Thailand**
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**Objective:** The aim of the study was to determine whether asthma management in Thailand is succeeding in achieving the levels of control, specified in national and international asthma guidelines.
**Methodology:** Adults with asthma in Bangkok, Chiang Mai, Songkhla, and Khon Kaen were interviewed, and we have reported on their asthma severity, morbidity, control, perception of asthma, and healthcare use.
**Results:** A total of 466 asthma sufferers were interviewed. The burden of asthma was high, with 14.8% of respondents being hospitalized for their asthma in the past year. One-quarter of those surveyed had lost workdays as a result of their asthma, and most patients felt that their lifestyle was limited. The majority of respondents had intermittent asthma (62.9%), 10.5% had mild persistent asthma, 17.6% had moderate persistent asthma, and 9.0% had severe persistent asthma; increasing severity was significantly associated with increased emergency healthcare use ($P < 0.00001$). Asthma sufferers greatly underestimated the severity of their condition. Only 36.0% used reliever medication, and use of inhaled corticosteroids was low at 6.7%. Understanding of the inflammatory basis of asthma was poor. Few patients underwent lung function tests or took peak flow meter readings.
**Conclusions:** The burden of asthma is high in Thailand, and guidelines are not being followed. Encouraging greater use of inhaled corticosteroids will be an important step towards improving asthma control.

**Key words:** asthma, control, management, Thailand.

## INTRODUCTION

Asthma has become a major public health concern worldwide.[1] Recent advances in science and medicine have improved our understanding of asthma, but its prevalence appears to be increasing.[2,3] Furthermore, morbidity and mortality are still significant, and this is believed to be partly a result of under-use of preventative treatment.[4]

The Global Initiative for Asthma (GINA) guidelines, which aim to improve asthma care, were produced in 1995 by the National Heart, Lung and Blood Institute and the World Health Organization.[1] Two large-scale surveys of asthma management in Europe (Asthma Insights and Reality in Europe; AIRE)[5] and the USA (Asthma in America; AIA)[6] were undertaken several years after the publication of the guidelines. However, both reported disappointing data that showed asthma control in these regions falls far short of the goals defined for asthma management.[5,6]

In two studies conducted in Bangkok and Khon Kaen as part of the International Study of Asthma and Allergy in Childhood (ISAAC) programme, the 12-month prevalence of wheezing in school-age children was reported to be around 10–13%.[7,8] However, there is a lack of published data reporting the prevalence of adult asthma in Thailand.

Asthma management guidelines for Thailand were published in 1994–1995,[9] and revised in 1997–1998 following GINA recommendations.[10] The guidelines emphasize the role of airway inflammation in the

Correspondence: Watchara Boonsawat, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand. Email: watcha_b@kku.ac.th

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**Table 1** Study population

| | Bangkok area 1 | Bangkok area 2 | Chiang Mai | Songkhla | Khon Kaen | Total |
|---|---|---|---|---|---|---|
| Screened (*n*) | 3129 | 3002 | 3037 | 3000 | 3053 | 15 221 |
| Ever had asthma (*n*, %) | 125 (4.0) | 123 (4.5) | 122 (4.0) | 128 (4.3) | 115 (3.8) | 613 (4.0) |
| Interviewed (*n*) | 75 | 121 | 84 | 91 | 95 | 466 |

pathogenesis of asthma and recommend that inhaled corticosteroids (ICS) should be used to treat airway inflammation in all severities of asthma, except intermittent asthma. However, the level of asthma control in Thailand has never been examined. This study examined the level of asthma control and asthma management approaches in adults in Thailand.

## METHODS

### Study areas

This survey was conducted in five centres within four major cities of Thailand: Bangkok (Phyathai and Pathumwan), Chiang Mai, Songkhla, and Khon Kaen. Bangkok is the capital of Thailand and is situated in the central part of the country. Chiang Mai is the second largest city and situated in the north of Thailand. Khon Kaen is in north-eastern Thailand and Songkhla is in the south. The inner-city area of each selected city was chosen.

### Study population

The survey was conducted between October 2000 and April 2001. In each inner-city centre, approximately 3000 subjects aged 20–44 years were screened through systematic sampling. The chosen areas were divided into several blocks, and systematic sampling of households within these randomized blocks was performed by door-to-door recruitment. In the first part of the study, subjects were interviewed using the ISAAC questionnaire,[11] which was translated into Thai by a panel of paediatric allergists. The ISAAC questionnaire was selected for use because it has been used several times for children in Bangkok, Chiang Mai, and Khon Kaen, allowing for comparisons with existing paediatric data. Only those who answered 'yes' to the question, 'Have you ever had asthma?' were included in the study.

### Data collection and analysis

Participants were questioned in detail about their asthma management, severity, morbidity, and control, as well as their perception of their asthma and healthcare usage. Trained interviewers gave the questionnaire during home visits. At the end of each working day, data from each questionnaire was checked and verified by a supervisor. The association between asthma severity and hospital admissions or emergency room visits, was determined using the $\chi^2$ test for trend.

**Table 2** Demographic data

| Characteristic | No. ($n$ = 466) |
|---|---|
| Male sex (*n*, %) | 174 (37.3) |
| Mean age (years, SD) | 32.3 (8.04) |
| Age at asthma onset (years, SD) | 15.8 (10.8) |
| Current smoker (*n*, %) | 87 (18.7) |

## RESULTS

### Sample population

Of the 15 221 subjects screened, 613 subjects (4.0%) reported ever having asthma and full interviews were completed by 466 asthma sufferers (76.0% of eligible subjects) as shown in Table 1. Demographic data are summarized in Table 2. The average age at onset of asthma was 15.8 years, indicating that half the individuals developed the condition during childhood.

### The burden of asthma

The survey revealed that the burden of asthma was high for asthma patients. In the year prior to the survey, 14.8% of asthma patients were admitted to hospital, 21.7% reported one or more emergency room visit, and 23.6% lost workdays due to asthma. Asthma also affected patients' lifestyles, with patients suffering significant or some limitation of sporting activities (66.1%), sleep (62.5%), choice of employment (52.3%), normal daily activities (51.2%), and social activities (34.8%).

### Asthma severity

In the 4 weeks prior to the survey, 38.8% of asthma sufferers had symptoms during the day and 42.7% reported waking up at night due to asthma. The frequency of day-time and night-time symptoms was used to classify asthma severity (Table 3). Of all asthma sufferers surveyed, 9% were classified as hav-

**Table 3** Asthma severity according to asthma symptoms

| | Daytime symptoms | Night-time symptoms |
|---|---|---|
| Severe persistent | Continuous | Daily |
| Moderate persistent | Nearly daily, > 1/day | > 2/week |
| Mild persistent | > 1/week, < 1/day | > 2/month |
| Intermittent | < 1/week | < 2/month |

**Table 4** Patient-assessed severity compared with severity according to the Global Initiative for Asthma (GINA) guidelines

| Asthma severity (patient classification) | Severity according to GINA guidelines: Intermittent % | Mild persistent % | Moderate persistent % | Severe persistent % |
|---|---|---|---|---|
| No symptoms | 66.2 | 36.2 | 17.3 | 16.7 |
| Mild | 22.1 | 38.3 | 49.4 | 23.8 |
| Moderate | 11.0 | 21.3 | 27.2 | 35.7 |
| Severe | 0.7 | 4.3 | 6.2 | 23.8 |

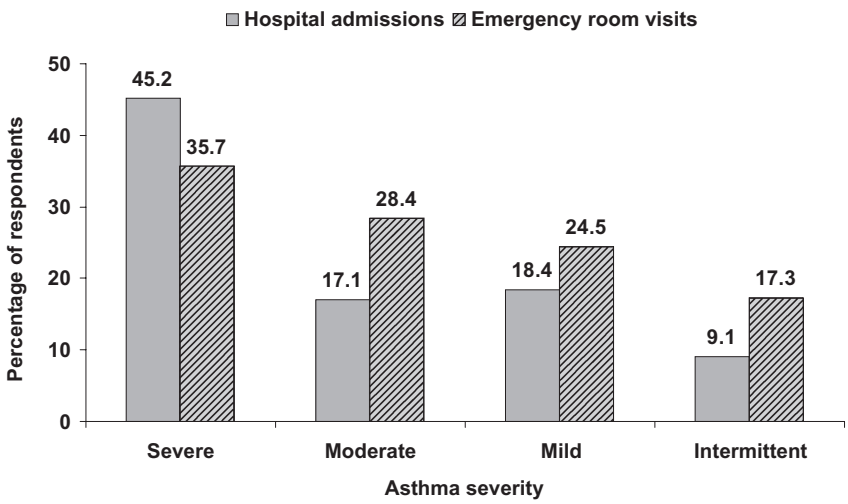


**Figure 1** Hospital admissions and emergency room visits due to asthma in the past year, according to severity classification.

ing severe persistent asthma, 17.6% had moderate persistent asthma, 10.5% had mild persistent asthma, and 62.9% had intermittent asthma.

Patients were asked to estimate the severity of their asthma over the past 4 weeks: 49.7% responded that they had no symptoms, 28.8% said they had mild asthma, 17.3% said they had moderate asthma, and only 4.2% believed they had experienced severe asthma. A comparison between patient-assessed severity and severity according to the GINA guidelines is shown in Table 4, which demonstrates that as many as 40.5% of those patients who assessed their asthma as mild or reported no symptoms, were in fact suffering from severe asthma.

## Healthcare usage

In Thailand, patients can seek medical treatment by going to public hospitals, private hospitals, or private clinics. The public hospitals provide a service at low cost, but patients have to pay the full cost of their medications. Private hospitals and private clinics provide services at a higher cost.

The most common source of asthma treatment in the urban areas surveyed was attendance at a public hospital, as reported by 32.6% of asthma sufferers. The remaining patients attended private clinics (25.3%), private hospitals (10.9%), or pharmacies (7.3%). However, 23.2% of asthma sufferers had never consulted a doctor to obtain treatment for their asthma.

Asthma severity was significantly correlated with hospital admissions and emergency room visits in the past year ($P < 0.00001$, $\chi^2$ test for trend). In total, 45.2% of patients with severe persistent asthma had been admitted in the past year compared with 9.1% of patients with intermittent asthma. Interestingly, 18.4% of patients with mild persistent asthma had been admitted in the past year (Fig. 1).

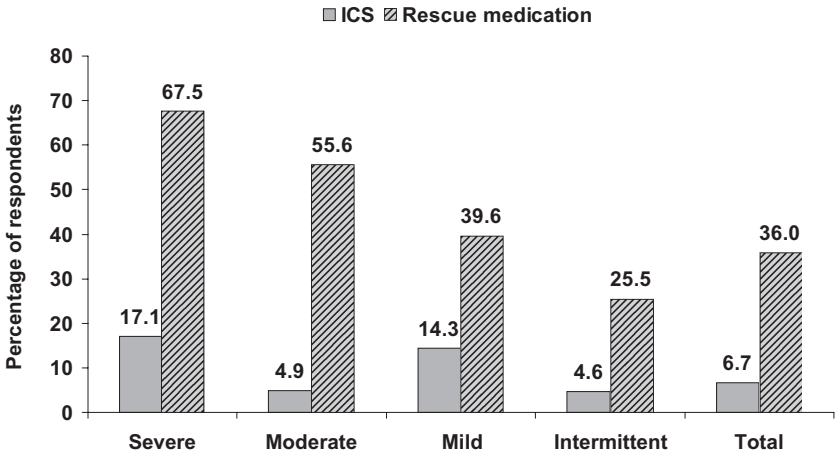


**Figure 2** Asthma medications given in the 4 weeks prior to the survey.

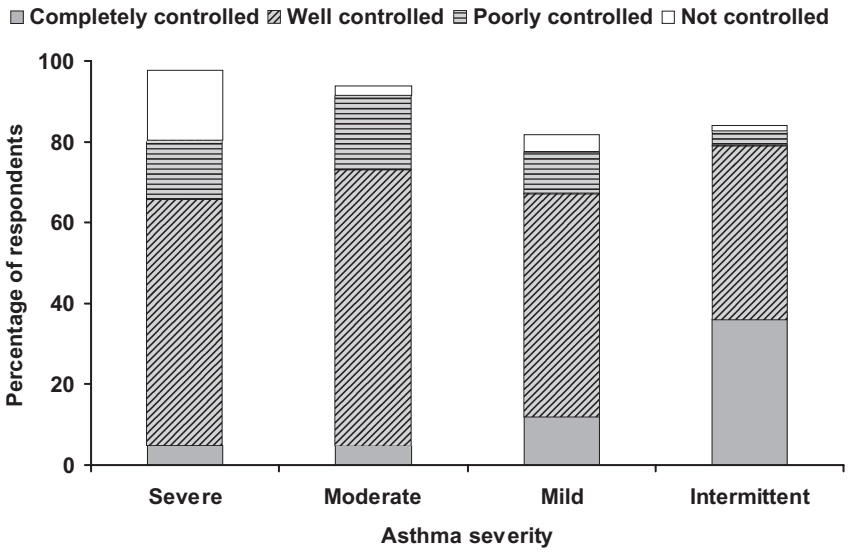


**Figure 3** Level of perceived control of asthma in each severity classification.

### Asthma treatment

Most asthma patients in Thailand (73.7%) received treatment only when they had symptoms. In the 4 weeks prior to the survey, 36.0% of patients had used rescue medication, but only 6.7% had used ICS. Figure 2 shows the asthma medications used according to severity. Only 17.1% of patients with severe asthma (and only 6.7% of patients overall) received ICS.

### Asthma control

Levels of asthma control as defined by individuals with asthma are shown in Fig. 3. The survey showed that among those with severe asthma, 4.9% thought that their asthma was completely controlled and 61.0% thought that their asthma was well controlled, in the past 4 weeks. Only 31.7% felt that their asthma was not controlled.

### Asthma management and knowledge

Only 27.4% of the patients surveyed had ever had a lung function test; 13.3% had heard of a peak flow meter; and only 3.2% of the patients had a peak flow meter at home. Only 8.8% of the patients were aware that airway inflammation is a cause of asthma.

## DISCUSSION

Asthma management guidelines were published in Thailand in 1994–1995[9] and revised in 1997–1998[10] following the publication of the GINA guidelines. However, the results of this survey of asthma control in five urban centres indicate that asthma management in Thailand falls short of goals for long-term asthma care, both those set globally,[1] as well as country-specific objectives[9,10] (Table 5).

Several meetings were held to promote the use of the national asthma management guidelines among

**Table 5** Global Initiative for Asthma (GINA) recommendations and results from this survey

| GINA guidelines | Results from this survey |
|---|---|
| Goal of management | |
| Minimal symptoms | 42.7% of asthma patients reported waking up at night in the past month |
| No emergency visits | 21.7% had visited an emergency room in the past year |
| Minimal (ideally no) need for p.r.n. $\beta_2$-agonists | 36% had used $\beta_2$-agonists during the last month |
| No limitations on activities | 66.1% had some limitation of sporting activities |
| Near normal lung function | Only 27.4% of the patients had ever had a lung function test |
| Diagnosis and monitoring of treatment | |
| Measurement of lung function is essential for diagnosis and assessment of severity | Only 27.4% of the patients had ever had a lung function test |
| Peak flow variability is one index of asthma severity | Only 3.2% of the patients had peak flow meters at home |
| Recommended treatment | |
| Inhaled corticosteroids are recommended in persistent asthma of all severities | Only 17.1% of severe asthma patients received inhaled corticosteroids |

**Table 6** Comparison of this survey with Asthma Insights and Reality in Europe (AIRE) and US surveys

| | This study % | AIRE[5] % | US[6] % |
|---|---|---|---|
| Asthma severity | | | |
| Intermittent | 62.9 | 37 | 39.8 |
| Mild | 10.5 | 19.3 | 22.1 |
| Moderate | 17.6 | 23.2 | 19.1 |
| Severe | 9.0 | 20.5 | 19.1 |
| Admissions in the past year | 14.8 | 7 | 9 |
| Emergency room visits in the past year | 21.7 | 11 | 23 |
| Inhaled corticosteroids used | 6.7 | 23 | 15 |

general practitioners in Thailand. Based on our findings, further initiatives are needed to make these messages more widely understood. Because this survey was conducted in the inner areas of the four major cities of Thailand where healthcare facilities are presumed to be better than in the rest of the country, the real level of asthma management in Thailand as a whole may be worse than reported here.

This survey shows that asthma patients in Thailand suffer a high level of morbidity. A comparison with the AIRE and AIA studies[5,6] showed that asthma patients in Thailand had more admissions to hospital than patients either in Europe or the USA, more emergency room visits due to asthma than patients in Europe, and a similar number to patients in the USA (Table 6).

ICS are the mainstay of asthma treatment, and are recommended for the treatment of all severities of persistent asthma. However, less than one-fifth of patients with severe persistent asthma and less than one-tenth of all asthma sufferers surveyed, were using ICS. The under-use of ICS is one of the more likely and important causes of poor asthma control in Thailand, and there are several reasons for this. First, the cost of ICS is still high compared with that of oral $\beta_2$ agonists. Second, three-quarters of asthma patients in Thailand sought and received treatment only when they had symptoms. Third, understanding about the role of airway inflammation in asthma is low. If doctors followed the guidelines and prescribed ICS to patients with persistent asthma, and if patients were better informed on why and how they should use ICS, the level of asthma control in Thailand should improve.

Measurement of lung function is essential for diagnosing and assessing the severity of asthma. This survey showed that lung function tests are rarely used in the management of asthma in Thailand, which may lead to underestimation of asthma severity.

According to the asthma management guidelines, peak expiratory flow monitoring is essential in the assessment of asthma severity. The variability of peak flow meter readings provides a reasonable index of asthma severity, but only 13.4% of patients surveyed had ever heard of a peak flow meter, and only 3.2% of patients had a peak flow meter at home. Severity classification using day-time and night-time symptoms correlates with hospital admissions due to asthma. Thus, the need for peak flow meter readings in the assessment of asthma severity could be disputed. However, their role in patient self-monitoring of asthma deterioration is important and their wider use for this purpose should be encouraged.

Perception of asthma control by patients is important in improving asthma management. In this survey, the majority of patients with severe asthma felt that their asthma was well controlled, despite the finding that many experienced symptoms nearly every day. This is a major obstacle to improving

asthma control, and in order to improve asthma management, we have to raise patient expectations of the level of control that can be achieved.

Healthcare services in Thailand at the time of this survey were not provided free of charge. This may be the reason that up to 23.2% of asthmatic patients had never consulted a doctor for treatment. Under-usage of lung function tests and inappropriate use of ICS are the key barriers to obtaining asthma control in Thailand. For patients, poverty, expectations, perceptions and a lack of knowledge about the inflammatory process, targets of treatment, and asthma control, are the leading barriers. Strategies to improve asthma control involve encouraging physicians and patients to improve the implementation of existing asthma management guidelines through constant doctor and patient education, mass media awareness campaigns, and strong support for patient groups.

In conclusion, it is clear that asthma management guidelines are not widely followed in Thailand. This leads to higher asthma morbidity and there is sufficient evidence to encourage further programmes aimed at improving the implementation of existing asthma management guidelines.

## ACKNOWLEDGEMENTS

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