REVIEW ARTICLE

Reduction of asthma burden is possible through National Asthma Plans

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To cite this article: Kupczyk M, Haahtela T, Cruz AA, Kuna P. Reduction of asthma burden is possible through National Asthma. *Allergy* 2010; **65**: 415–419.

Keywords
asthma diagnosis, asthma treatment, health care plan.

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Accepted for publication 8 October 2009

DOI:10.1111/j.1398-9995.2009.02265.x

Edited by: Jean Bousquet

Abstract

Despite increase in understanding of asthma patomechanisms the practical actions to lessen asthma burden in the communities are far behind of scientific knowledge. There are still reports of uderdiagnosis and poor treatment leading to repeated severe exacerbations, often demanding emergency care and hospitalisation, which cause most of the economic burden both for families and society. From the public health perspective, the key issue is to implement the best standards of care in every-day practice. The problems are different in high income compared to low- and middle-income countries, and the solutions have to be tailored to each country needs and resources. We present here examples from Finland, Poland and Brazil, to show that asthma burden can be reduced using varied strategies in quite different societal, economical and health care environments. The experience from those interventions confirms that regardless of the health care system and its coverage, a major change for the better can be achieved by local efforts, systematic planning and networking to implement the best asthma practice.

The scale of asthma epidemic around the world is tremendous. The number of patients suffering from asthma has doubled during the last 10 years (1). The World Health Organization (WHO) assumes that 300 million people are affected by this disease, and its incidence is still rising, involving estimated 100 million further patients by the year 2025. Around 250 000 people die prematurely each year as a result of asthma (2, 3). Readers of Allergy know this, but what about other colleagues like general practitioners (GP) and policy makers responsible for allocation of funds for health care? GPs and paediatricians are usually the patient's first contact with health care being thus a vital link responsible for early diagnosis and introduction of effective treatment (4).

Asthma pathomechanisms are better understood, but practical actions to lessen asthma burden in the communities are far behind of scientific knowledge. Several international and national guidelines have improved the situation and spread out the evidence-based data (5). Taking into account the local conditions of a given country, including health care and drug reimbursement system, the recommendations support physicians taking care of patients with asthma. Guideline updates have increased in volume reflecting advanced knowledge but simultaneously have not often given guidance for practical implementation or handy tools for the best practice at the population level.

Asthma is still much underdiagnosed and poorly treated (6). Many patients have repeatedly severe exacerbations, often demanding emergency care and hospitalization, which also cause most of the economic burden both for families and society. The annual asthma-related costs in the European Union amount to some €17.7 billion, while the estimated loss of production capacity is € 9.8 billion per year (1). Asthma is a variable disease not curable with the available treatments, but all patients can be reasonably well controlled with modern medication. From the public health perspective, the key issue is to implement the best standards of care in every-day practice.

In 2006, in Norway, Reindal and Øymar (7) performed a prospective study of 337 admissions of 288 children to hospi-

tal because of asthma exacerbations. Only 43% of the children had received inhaled steroids prior to admission, in contrast to symptomatic treatment with β_2 agonist (74% of cases). Authors concluded that there is a high potential to prevent hospital admissions by improving asthma care. In 2007, in Turkey, a cohort of 1134 children with asthma were studied (8). Although those children had symptoms suggesting asthma for an average of 30 months, only 41% of them were diagnosed as having the disease prior to examination in the reference centre, and not more than 21% of them were treated accordingly to guidelines. The latest Allergic Rhinitis and its Impact on Asthma (ARIA) Asia-Pacific Workshop reported that only 63% of GPs are aware of asthma guidelines and use them (9). The asthma diagnosis had been based mainly on clinical history, and only 42% of GPs instruct patients to use a peak flow meter to monitor symptoms. Underreporting, underdiagnosis and undertreatment of chronic respiratory diseases is a fact in most parts of the world (10).

Factors responsible for the increased asthma incidence are not fully understood, but environmental and lifestyle changes play a major role (11–14). The highest prevalences of asthma are in the developed world, with a few exceptions. Reports from some of these countries indicate that the occurrence is reaching a plateau (15), and asthma burden has decreased during the last 10 years in some of them. However, this is not the case in most of the world, and asthma prevalence and burden including the increase of costs are taking place in developing countries along with urbanization.

The problems are different in high income compared to low- and middle-income countries, and the solutions have to be tailored to each country needs and resources. We present here examples from three different countries, Finland, Poland and Brazil, to show that asthma burden can be reduced using varied strategies in quite different societal, economical and health care environments.

A national asthma implementation programme was undertaken in Finland 1994–2004 (population 5.2 million) (16). The programme focused on early diagnosis, active anti-inflammatory treatment from the outset, guided self-management and effective networking with the GPs and pharmacists. The results did not leave much to argue (17, 18). Even though the programme was not able to halt the still ongoing rise of asthma occurrence, it reduced markedly mortality, hospital days and disability. In 2005, the predicted total asthma costs (health-care, drugs, disability and production loss) were estimated to be € 500–800 million, but they were around € 230 million (19). The cost prediction is a theoretical model but shows the enormous potential of cost savings by improving treatment. This outcome was mainly attributed to early and more effective use of anti-inflammatory medication especially inhaled corticosteroids (ICS), but also by effective networking among health-care professionals to detect asthma early, prevent exacerbations and keep the disease under control. The Finnish case showed that a systematic implementation of best clinical practice makes a major change in a relatively short period of time. In the footsteps of Asthma Programme, The Finnish Allergy Programme 2008–2018 was recently launched to combat the allergy epidemic (20). The new action aims to increase immunological tolerance and promotes secondary prevention.

In Poland (nearly 40 million inhabitants), the rapid rise in the prevalence of asthma and other allergic diseases was noted in 1990s. The Polish Multicentre Study of Epidemiology of Allergic Diseases (PMSEAD-study) (21) showed the prevalence of asthma to be 8.6% in children and 5.4% in adults. Underdiagnosis and undertreatment are major problems: half of the symptomatic adults and 70% of the children did not have the right diagnosis (22). Significant deterioration of lung function in many of those patients was also detected (23). In adults, risk factors for poor disease control included long duration of symptoms, aspirin (ASA)-hypersensitivity and house dust mite sensitization in adults (24). In asthmatic children, cockroach was one of three most common allergens causing sensitization. Cockroach-sensitized children had severe asthma more often than children with other allergies (25).

In 2004, the level of asthma control was studied in Poland (26). More than 70% of respondents reported diurnal symptoms of asthma at least once a week, while 20% experienced them daily. Almost 18% of the subjects were hospitalized during the preceding year. Only 27% were treated with inhaled corticosteroids, and 50% received β_2 agonists. In 2006, approximately 58 000 hospital admissions because of asthma with over 300 000 hospital days were recorded in Poland, including 5000 life-threatening cases. In this country, asthma mortality is one of the highest in Europe, reaching up to 5–10 deaths per 10 000 patients/year.

A pilot programme was undertaken in 2000–2003 in Lodz Province – Poland, which is a highly urbanized region with a high asthma prevalence rate (27). The focus was early detection and optimal treatment of asthma in children and adolescents by GPs and specialists. Funding was provided to 127 primary and 12 specialized care centres. During the period of 2000–2003, the number of new asthma diagnoses increased from 0.99/1000 inhabitants to 2.19/1000, however the hospital admissions caused by asthma exacerbations decreased significantly from 1.48/1000 to 0.84/1000 (Fig. 1). Also, the hospital stay periods shortened.

In 2008, the Polish Society of Allergology launched the National Asthma Programme titled POLASTMA (28), which emphasizes early diagnosis and therapy. The programme design is based on the Finnish experience, and the goals include as follows: (i) early diagnosis and better disease control, (ii) increase in the anti-inflammatory medication instead of symptomatic treatment, (iii) reduction in asthma severity and deaths and (iv) reduction in asthma-related disability for work (Table 1). The goals are to be achieved by educating both health care professionals and patients, by health promotion and systematic changes in the organization of the care (Fig. 2). More than 4000 physicians have already been involved in the programme actions during one congress and 15 regional meetings. The database and network of severe asthma care is under construction.

In Brazil, 24% of urban children have symptoms of asthma (29). Among adults, the same prevalence has been

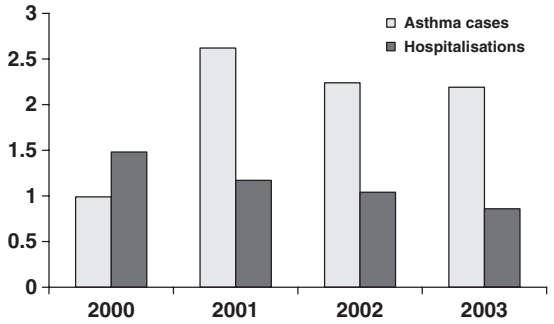

Figure 1 Rates of new asthma diagnoses (per 1000 inhabitants) and hospital admissions due to asthma exacerbations (per 1000 inhabitants) before (2000) and after 3 years of pilot asthma programme duration. Hospital admissions decreased by 43% and simultaneously duration of hospitalization decreased by 2.5 days (26).

Table 1 Major goals and chief action methods of the Polish National Programme of Early Diagnostics and Therapy of Asthma (POLASTMA) (28)

Polish National Programme of Early Diagnostics and Therapy of Asthma (POLASTMA)
Major goals of the Programme
Early diagnosis of asthma
Better pharmacological control
Reduced number of hospitalization days because of asthma
Decreased mortality rates because of asthma
Reduced number of persons with asthma-related disability for work
Increased use of anti-inflammatory *vs* symptomatic drugs
Reduced number of patients with severe, uncontrolled bronchial asthma
Prevention of disease complications and of therapy adverse effects
Higher social awareness, regarding the problems associated with asthma
Reduction of the total costs of care of the patients with asthma
Chief action methods for practical implementation of the Programme
Promotion of diagnostic and therapeutic management, conformable with standards based on scientific evidences
Extension of educational networks based on local specialist centres
Training coverage of key target groups: PCPs, paediatricians, nurses, pharmacists, obstetricians
Educational coverage of patients and of the whole society
Unification of diagnostic methods, creation of local diagnostic reference centres, available for PCPs
Promotion of the therapy of disease exacerbations, based on individual management plans
Education in the proper use of inhalation drugs
Promotion of healthy life styles, including the fight with tobacco smoking addiction
Promotion of research on bronchial asthma

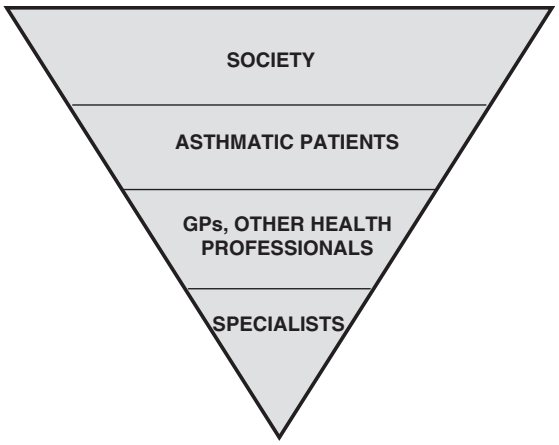

Figure 2 The implementation of the best asthma practice is based on the knowledge and effort of specialists, effective network of general practitioners (GPs) and other devoted health professionals. The benefit is clear, both for individuals suffering from asthma as for the whole society.

found in a population-based sample (30), in this middle-income country, which has recently shifted from predominantly rural to predominantly urban. The proportion of individuals with persistent asthma reporting use of inhaled corticosteroids is low. In spite of high prevalence, asthma management in the public health care is usually limited to treatment of exacerbations with bronchodilators and systemic corticosteroids. The combination of high prevalence and lack of strategy for asthma management leads to high costs and unacceptable mortality.

Thus, in 2003, the Programme for Control of Asthma and Allergic Rhinitis (ProAR) was launched in Salvador (2.8 million inhabitants), a city located in the State of Bahia, where the prevalence of asthma among adolescents is well above the Brazilian average (31). Patients from low-resource settings (majority of the population of Salvador) received free medication for asthma and rhinitis according to international guidelines. Extensive education and care were provided by a multidisciplinary team comprising physicians, nurses, pharmacist, social workers and psychologists. In a pilot group of 64 subjects with severe asthma, during the 12 months of follow-up, asthma control scores improved by 50% and quality of life by 74%. Patients had on average five fewer days of hospitalization a year and 68 fewer emergency or nonscheduled medical visits per year. The costs for asthma care were reduced on average by US$ 733 per patient/year to the families and by US$ 387 to the public health system (32).

A subsequent analysis in a greater sample of patients demonstrated that before the ProAR, the total cost of severe asthma management of one family member took 29% of the entire family income. After being enrolled in the programme – an annual surplus of US$ 1500 per family became available (33, 34). This result confirms that action based on providing access to medication, education and health care works among the low-income populations as well. From 2003 to

2006, nearly 2900 subjects with severe asthma have been assisted by ProAR. Preliminary analysis of the trends of hospitalizations for asthma in the entire population of the city indicates that a 74% reduction in hospitalization rates occurred after the implementation of the programme (35).

We have presented here three National Programmes as examples, but out there are many more, in Japan (36), Canada (37), Australia (38) and even Tonga (39) to mention some. One important recent initiative comes from Ireland, where the Asthma Society has put up a demonstration project to show a way to National Asthma Programme.

A platform for international cooperation has been created by the Global Alliance against Chronic Respiratory Diseases (GARD), lead by WHO (40). GP programmes may be implemented along the guidelines of another WHO strategy: Practical Approach to Lung health (PAL) (41). All the experience from the national and local interventions converge on the same direction: regardless of the health care system and its coverage, a major change for the better can be achieved by local efforts, systematic planning and networking to implement the best asthma practice. The gain is huge, both in reducing human suffering as well as the societal costs, as first shown in Finland. We can put down the asthma burden – it is possible, and it is our responsibility to collaborate with national public health authorities and international organizations for better efficiency and optimal results.

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