

Prevention in practice

Prevention of asthma and approaches for enhanced care in the Eastern Mediterranean Region

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Introduction

Asthma is one of the commonest chronic diseases worldwide and is increasing in children and probably also in adults. While it is a worldwide problem, the prevalence of the condition seems to be higher in affluent than non-affluent populations. The prevalence of childhood asthma has been reported to vary between 1% and 30% in different populations [1]. One of the major problems associated with tracking trends with time and trends between countries relates to different definitions of asthma being used. When the same test is used in the same place at different times, it can be seen that in south Wales, for example, the prevalence of childhood asthma increased from 11% to 15% over a 15-year period [2]. In Australia, the prevalence of reported wheezing in the previous 12 months doubled from 12% to 24% in schoolchildren between the years 1980 and 1990 [3]. That this was not just a reflection of increased awareness of the symptoms in this study was shown by corroboratory evidence of a parallel increase in the number of those exhibiting hyperresponsiveness. In the United Kingdom, latest figures suggest a childhood asthma prevalence of 13% of the pop-

ulation and an adult rate of between 5% and 8% [4].

Since the 1970s, the prevalence of asthma as well as the morbidity and mortality due to this condition have also increased in the United States [5]. From 1980 to 1989, the age-adjusted death rate for asthma as the underlying cause of death increased from 1.3 per 100 000 population to 1.9 per 100 000. During this period the death rate increased more for females (from 1.3 to 2.0 per 100 000) than for males (from 1.3 to 1.6 per 100 000) [6]. The annual asthma death rate was consistently higher for blacks than for whites during this period.

Possible explanations for the increasing prevalence of asthma and the prospects for primary prevention

The tendency to have asthma and other atopic diseases is inherited, probably on several genes. The increase in prevalence of asthma over the past two to three decades is unlikely to be explained by a change in genetic constitution and more likely reflects environmental changes [7]

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leading to the condition being activated in an increased number of genetically susceptible people. International comparisons of prevalence suggest a correlation with the process of "westernization" or modernization and the key areas for study have therefore involved:

- maternal smoking
- workplace environment
- indoor environment
- outdoor environment
- infections.

Maternal (and to a lesser extent paternal) smoking has been shown to be associated with an increased risk of the offspring developing asthma, and an increased risk of the child developing asthma at an earlier age and requiring more treatment than if the mother did not smoke [8]. Other studies have suggested a correlation with the amount smoked by the mother, and it is possible that antenatal smoking has a greater effect than postnatal smoking and has an effect on the lung function of the infant [9]. The effect of maternal smoking seems to be greatest in enhancing the risk of children developing wheezy illnesses in the first few years of life. It is less certain that maternal smoking is associated with an increased risk of older children having asthma. The mechanism of the association is not known but maternal smoking during pregnancy increases cord blood IgE, and it is likely that smoking in some way enhances the likelihood of the offspring developing atopic manifestations [10].

Maternal smoking is the only factor which is thought to be definitely associated with an increased prevalence of asthma and wheezy illnesses in the young. In adults, many occupational agents have been shown to induce asthma; these include isocyanates (e.g. as used by car paint sprayers), flour and grain dust, wood dust, solder

fumes and laboratory animals. Atopic people and those who smoke may have an enhanced risk of problems if exposed to occupational sensitizers. It is vital that such occupational causes of asthma (which may account for up to 5% of adult cases) are recognized since disease incidence can be reduced by reducing exposure.

While maternal smoking and occupation are well studied causes of asthma, other explanations for the rising prevalence of the condition are less well validated. One of the problems is that large-scale studies are required, and even when two variables are seen to move in the same direction, it does not necessarily mean that such a relationship is causal. In addition, costly intervention studies, which are also difficult to perform, are then needed.

In many countries of the world, including those of the Eastern Mediterranean Region, there have been changes in diet over the past few decades with a reduction in the consumption of fresh food and increased reliance upon processed and refined food. Interesting associations between fish, salt and magnesium intake and lung function, airway hyperresponsiveness and asthma have been demonstrated, but with no conclusions as yet being drawn which could form a primary prevention strategy [11-14].

Over 90% of a child's time is spent within the house and changes in cooking methods, house design and exposure to antigenic materials such as house-dust mites, cockroaches and other insects may well take place. Some large-scale studies on the importance of these factors are now under way.

The role of traffic pollution in the increased prevalence of asthma is unclear. While nitric oxide and particulate matter may well exacerbate established cases, they have not been shown to initiate the condi-

tion. Prevalence studies in Germany and in urban and rural parts of Scotland do not demonstrate support for the concept that traffic pollution increases the risk of a population developing asthma [15]. However, respiratory epithelial damage can result from exposure to traffic pollution and this may enhance the likelihood of increased sensitization to antigens as a secondary phenomenon. There is animal evidence to show that combined diesel particulates and allergen exposure promote the development of IgE [16].

Although there is no evidence that viral infections directly cause the onset of asthma, there is a suggestion that they may contribute to its development [17,18].

In summary, strategies for the primary prevention of asthma in children should involve efforts to reduce maternal smoking; in adults it should be directed towards enhancing workplace safety. In the future, it may be possible to identify a "fetus at risk" and provide meaningful advice regarding diet and the environment to reduce the chances of the development of asthma. However, that is not possible at present and more research in this important area is needed. It is possible that some clues as to the reasons for differing prevalence rates in different countries could be found by research and epidemiological studies within the countries of the EMR.

Interventions in those with established asthma

Potential areas for intervention include:

- nonpharmacological environmental modification
- pharmacological intervention
- provision of health care and patient education.

Environmental modification

All the published national and international guidelines on asthma management highlight the importance of identifying and avoiding precipitating causes of asthma where possible. Such environmental modifications can reduce the requirement for conventional treatment. Studies of children transposed to high altitudes (where there are fewer allergens and pollutants and less cigarette exposure) have confirmed the advantages of such action [19] and the cost-benefits have been identified [20]. Avoidance of exposure to domestic pets and attempts to reduce exposure to dust mites may also be effective. However, some factors cannot be avoided, or to do so involves unjustified expense, unproven benefit or unacceptable impairment of the quality of life. Further research is clearly required in these areas.

Pharmacological intervention

Over the past 20 years, there has been increasing awareness that asthma is an inflammatory disease often present, even when the patient has no symptoms, and which can cause irreversible changes if left untreated. This knowledge has led to a change in emphasis of treatment away from a reliance on bronchodilator therapy to relieve symptoms when they occur, to a situation where a greater proportion of those with asthma are advised to take regular anti-inflammatory treatment. An example of a stepwise approach to the management of asthma in adults and children as outlined in various guidelines is shown in Figure 1.

Provision of health care and patient education

It is of no value to have effective treatments available if they are not used. Optimal care and the desired therapy outcome can be achieved only if health professionals are

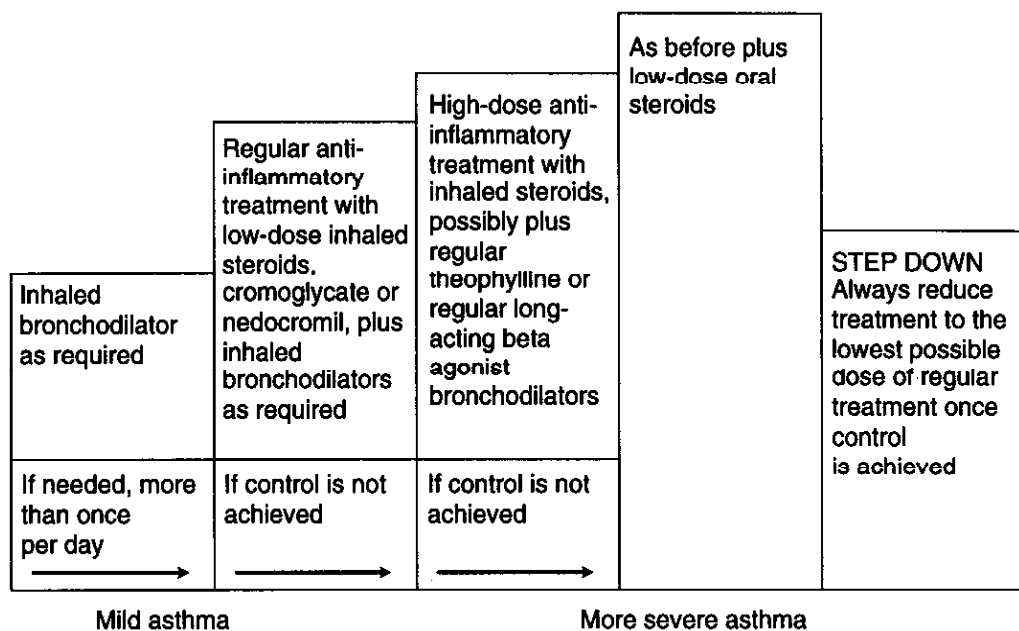


Figure 1 Example of a stepwise approach to the pharmacological treatment of asthma

well educated and work in a well organized manner delivering treatment in a way that ensures patient compliance.

Nothing confuses a patient more than to appear to be getting conflicting messages from different health care professionals. The use of national or international guidelines enables those who care for people with asthma to approach the patient with a common "language" and a common "message". Such guidelines need to be drawn up or adapted with care but where guidelines have been evaluated in a variety of conditions, their use has been shown to be associated with significant improvements in a number of outcome measures [21]. However, production of guidelines alone is unlikely to lead to a change in the performance of health care professionals. Active education of health professionals about the content of

the guidelines is necessary. Feedback to health professionals on how their performance compares with the recommendations of the guidelines has also been suggested to have a positive effect. It is also more likely that guidelines will be useful if they are taken down to a local district, hospital or department level where there can be a sense of ownership and a feeling of local relevance.

All the published guidelines emphasize the importance of patient education and it is imperative that doctors think "beyond the prescription". Each patient brings to the condition of asthma a different personality, different expectations of the condition and its treatment and different past experiences, and the importance of good communication cannot be overemphasized. Cultural attitudes, unexpressed fears and concerns and

lack of understanding and information may all act as barriers to education and lead to noncompliance. Such fears and expectations should be explored and patients need to be given the information which they require to enable them to ask appropriate questions. Fifty per cent of all spoken advice is forgotten within five minutes of a consultation ending and thus all patients need to be offered the opportunity of regular supervision and reinforcement of advice by written, audiovisual or group support methods as appropriate to their needs. As a minimum, all parents need to know the diagnosis, the difference between relieving and preventive treatments, how to use inhalers and, if appropriate, monitoring devices, signs that the asthma is worsening and what to do under those circumstances.

The aim for many patients (or parents) will be to take control of their asthma to varying degrees in a manner guided by health professionals. Such self-management has been shown to be associated with increased compliance, improved asthma control and significant savings in terms of direct and indirect costs [22,23]. Much patient education is done on an individual basis by the patient and health professional working together in partnership, but in some instances the task could be shared, with advantage, with other health professionals or enhanced by group educational efforts [24-26].

Asthma as a health problem in the Region

There is enough evidence to indicate that asthma is a major public health concern in many countries of the Region. According to some reports from Egypt, it affects up to 8% of children studied [27].

Despite the increasing importance of asthma as a cause of morbidity, disability and mortality in the Region, basic health care requirements for people with asthma are often inadequate in many countries of the Region and national initiatives for the prevention and control of this problem are generally lacking.

Review of the available data and discussions with regional experts indicate that there are numerous problems and major gaps in the provision of optimal health care. These, as well as the trends observed in the Region, are summarized as follows.

- Available evidence, though incomplete, suggests prevalence has increased over the past three decades. Environmental factors have not been systematically investigated. A common allergen is believed by some to be the house-dust mite and smoking is a major factor in most countries. Other possible factors are related to traffic pollution, the use of gas and kerosene in cooking and the sharing of houses with animals in the rural areas of some countries.
- There is a definite lack of standardized data on the epidemiology and predisposing factors of asthma in most countries of the Region. The studies conducted so far have used different methodologies which have created considerable discrepancies and which have therefore made comparison difficult. In addition, national capacities in epidemiological data collection and disease surveillance are inadequate. Only very limited data exist on the use of health services.
- There is a general lack of commitment among health policy-makers with regard to asthma control. This is justifiable in view of the immense problems caused by communicable diseases in

some countries of the Region and the limited resources available for competing healthcare needs. However, health policy-makers need to become aware of the increasing magnitude of the problem and its impact on public health, particularly in countries where major achievements have been made in the control of the infectious diseases of childhood.

- The minimum standards of health care for people with asthma are not freely available in many countries of the Region. There is little public and patient education, which is essential for good management. Myths and misconceptions are commonly encountered among both patients and health care professionals. People are not empowered to share responsibility in managing and monitoring their problem, and there are few organized educational programmes for those affected and their families. In most countries of the Region, educational material for people with asthma and their families is either unavailable or grossly deficient. There may be no access to the essential tools for treatment such as drugs, especially at the primary health care level. In many countries, the cost of treatment is too high for people to afford, leading to discontinuation of treatment and poor follow-up. The lack of appropriate health care at the primary health care level probably leads to underdiagnosis, especially among children.
- Physicians themselves and other health care providers are often not appropriately trained to deal with people with asthma. Although asthma is common, its management and control have not generally been incorporated into the training of primary health care providers.

Emphasis on appropriate management of asthma is also felt to be inadequately addressed by undergraduate medical and nursing curricula as well as in continuing medical education programmes. Irrational prescribing is commonly encountered, particularly in relation to the overuse of expensive antibiotics, overuse of oral and parenteral steroids and overdependence on bronchodilators which have no effect on the underlying inflammatory process. Misconceptions also exist concerning the exaggerated side-effects of inhaled steroids.

- There are few standard management protocols and clinical practice guidelines on the management of asthma, particularly in primary health care.
- Because of inadequate public education, parents often deny the diagnosis of asthma and are not prepared to accept it, with serious negative implications for the prospects of good control and favourable prognosis. The new understanding of asthma as a long-term disorder and the consequent need for many patients to take long-term treatment are often not appreciated.
- Lack of compliance seems to be a major problem in the Region. Although unaffordable treatment costs are undoubtedly a major factor, insufficient education and impaired communication are probably the most important causes.
- Other specific problems include physicians being reluctant to label patients as asthmatic, doctors falsely reassuring mothers that their children will grow out of asthma and negative cultural attitudes, sometimes also shared by pharmacists and other health care professionals, towards the use of inhalers.

Box 1 Checklist of issues for national or district asthma planning teams

- What is the magnitude of the problem of asthma in the country or district?
- Who will provide the bulk of care in the area (primary health care or hospital, doctor or nurse, others)?
- What arrangements will be made for shared care among different health care providers (doctors and nurses, hospital and primary health care)?
- How will medical care be linked with community health facilities and educational initiatives?
- What are the major factors in the country or district which could be changed and thus could help prevent asthma from developing or could prevent exacerbation of asthma from occurring in those who already have asthma?
- What preconceived assumptions about asthma and its treatment and what cultural factors will need special attention?
- What treatments are currently used?
- What other treatments are available, affordable and stable in the climatic conditions of the country?
- Can inhaler devices and medicines be standardized to reduce cost, storage and availability problems?
- Who will provide emergency care?
- Which groups of the population are at special risk (e.g. inner city, poor, teenagers, minorities)?
- Who can be enlisted to help in education (community health workers/health-promotion facilitators/trained educators currently working on other programmes/self-help patient groups)?
- Who will take responsibility for the education of health care professionals?
- Who will take responsibility for the education of patients?
- How can asthma education and treatment be integrated into other programmes (e.g. child health)?

Adapted from the National Heart, Lung, and Blood Institute/WHO Workshop Report A global initiative on asthma, 1995

Strategies for asthma control in the Region

In view of the magnitude of asthma in the Eastern Mediterranean Region and the need to initiate prevention measures and to promote optimal health care delivery to those affected, and in the light of the information outlined in this paper, it is suggested that consideration be given to three possible approaches.

1. *Standardization and initiation of epidemiological studies to assess the size of*

the problem of asthma throughout the Region. This may involve:

- The development and use of a standardized questionnaire with surveys covering all geographical and socio-economic groups within a country.
- Conducting of smaller scale objective studies of prevalence. While some countries could consider the use of methacholine or histamine challenge, or others monitoring of the variability of peak flow over a few weeks, a more realistic method

may be utilization of a standardized exercise challenge. This should enable studies to be repeated in the same range of schoolchildren, for example, at different times and in different places.

- Documentation of the use of health care facilities in at least some areas in both primary and secondary care. This may also involve evaluating the economic costs of asthma to countries within the Region. While good asthma care may involve the initial expense of increased use of regular preventive asthma medication, considerable savings may result from reduced hospital admissions and indirect costs.
- 2. *Adoption of strategies for the primary prevention of asthma.* This will initially involve efforts to reduce maternal smoking in coordination with maternal and child health programmes and also to reduce the incidence of occupational asthma through public and employer education, supported by legislation where necessary.
- 3. *Introduction of regional and national clinical practice guidelines.* Some countries of the Region such as Egypt, Morocco and Pakistan have already begun discussions concerning the introduction of national guidelines, in some cases with the informal support of WHO or the US National Heart, Lung, and Blood Institute/WHO Global Asthma Initiative. The introduction of such guidelines is likely to involve the establishment of a national asthma control committee or planning team. Membership should include health planners, public health specialists, primary health care physicians, paediatricians, respiratory physicians, allergists, pharmacists,

health education specialists, patient support groups and health economists (when available). Such a planning team needs to consider the particular and specific issues related to their country, which may include items such as those listed in Box 1. The planning team can set minimum acceptable standards of health care, adapt previously published international guidelines so that they are locally relevant, and plan a programme of implementation, reinforcement and evaluation.

The programme of implementation may involve an initial national conference to launch the guidelines followed by regional and local meetings or training courses to educate health professionals regarding their content. In parallel with this process will be the necessity to undertake some public education (perhaps through the media) to help dispel major myths and misconceptions.

These initiatives will need to be continually reinforced and coordinated with continuing education programmes and integrated with medical, nursing and pharmacy training. Whenever possible, methods for evaluating the effect of the guidelines should be introduced. This may involve monitoring traditional parameters such as hospitalization rates or drug usage or may involve specific audit of care provided in primary health care facilities.

Conclusions and recommendations

Asthma represents an increasing health burden for the countries of the Region. Health care delivery is inadequate in many countries. Irrational prescribing and prac

tices are generally widespread and misconceptions are commonly encountered, both among the public and health professionals. Minimum standards of health care for individuals with asthma need to be identified.

Public education about asthma is urgently needed. Training of health care professionals on the management and control of asthma is equally important. There is inadequate epidemiological information regarding the exact magnitude of the problem and standardized methods need to be adapted or derived and implemented. Opportunities for primary prevention should be promoted.

Assistance should be provided to the countries of the Region in devising and implementing national guidelines on the management and control of asthma.

In view of the above, there appear to be specific priority lines of action that the Eastern Mediterranean Regional Office of the World Health Organization can consider when planning future initiatives on asthma control. These can be approached by establishing a task force of seven or eight regional and international experts with experience in epidemiological surveys, clinical

management and health economics with the following terms of reference:

- prepare a "model" standardized protocol for an epidemiological study that is relevant to the Region;
- formulate guidelines for national plans for asthma control which also cover aspects related to implementation and evaluation;
- adapt the international guidelines for asthma management to suit regional needs and circumstances.

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Asthma is more prevalent in children, causes a high morbidity and can be fatal even in young people. The reasons are poorly understood. It may be due to changes in the indoor or outdoor environment and may involve allergens in the air, especially domestic mites and occupational allergens. Climate is of importance because it directly affects the amount of allergen present in the environment, for example, a damp and warm climate favours the growth of mites and moulds. Possibly the increased prevalence of allergy and asthma is due to the synergistic action of air pollution or tobacco smoking with allergic sensitization. Passive smoking has also been involved in the allergic sensitization of children, boys especially, to common allergens in the air. Links with urbanization in some parts of the world have been suggested, as have housing environments, and dietary factors. Socioeconomic status within countries may also be involved because of related problems in obtaining appropriate medical care.

Source: The World Health Report 1997. World Health Organization, Geneva.