

REVIEW

Asthma in India: applying science to reality

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Introduction

Public health policies and priorities are based increasingly on 'evidence' in the form of data published in peer-reviewed journals. This evidence is often presented as guidelines for the management of various diseases. The guidelines are the result of meticulous research of relevant literature. This trend, away from 'enlightened perception' to 'evidence-based medicine' has been largely a welcome one. The largest drawback to this process, however, has been the lack of high-quality medical research in many parts of the third world. More than 50% of research papers in respiratory medicine comes from the US alone; another nearly 20% comes from the UK, Sweden and Canada [1]. This has meant that whereas the guidelines for management of diseases in the high-income countries are based on 'evidence', similar guidelines or recommendations for low-income countries are based on very little data and can therefore be sometimes less relevant and even inaccurate.

In an ideal world, policies resulting from research in the high-income countries would be universally relevant and applicable. In the real world, however, with its vast disparities in the distribution of resources and opportunities, it would be naïve to assume this to be so [2]. The inequality between countries, already vast, continues to increase. Income distribution within countries, particularly in the third world, is also far from uniform. If the health of low-income *people*, who are mostly, but not entirely, in the low-income countries, is to improve, serious consideration has to be given to improving access to optimum medical care. Substandard medical care is not only due to lack of knowledge but more importantly due to lack of resources and infrastructure, which prevents optimum use of such knowledge [3, 4]. When optimum medical treatment is not available under these circumstances, second best options should be acceptable both medically and politically. Low-cost alternatives to standard practices have been found to be safe as well as effective [5, 6]. The medical and health care delivery problems in the third world continue to be different qualitatively and in magnitude from those in the first world. Communicable diseases and malnutrition still extract a huge toll in low-income countries [7]. Moreover, though 'global' diseases like diabetes, hypertension and asthma are not uncommon in the third world, approaches to these diseases would have to consider local limitations in resources and infrastructure as well as the overall impact the disease has on the health of the country and the community. But if the needs of the third world are to figure more effectively in global programs, far more research

and reliable data need to come from these countries themselves.

Medical research in India

The health care problems of India are typical of a low-income country. However, there is some evidence that the medical research done here is not in the areas of greatest need [1]. More research is being done and published in cardiovascular diseases and cancer than on respiratory diseases, infections and pregnancy-related problems, which are all far more common.

There has been much improvement in life expectancy, infant mortality, literacy and the economy in India in the last 50 years. But diarrhoeal diseases, diseases of children, respiratory diseases and infectious diseases like malaria and tuberculosis are still the major medical problems [7]. In certain medical specialties, research in India is not only prolific but also of a high standard. In andrology and reproduction research, India ranks second only to the USA, the third (after the USA and UK) in tropical medicine and tenth in hygiene and public health [1].

There are several possible reasons for research in low-income countries being focussed on issues that are less important to those countries. Nearly one third of the entire expenditure on health care in the world is spent in the USA alone, on about 5% of the world's population [8]. As a result, the US has become the medical world's global pacesetter. The type of high-technology medicine that epitomizes American health care has so much prestige and glamour today that it greatly influences the ambitions of third-world doctors. Medical research in the world is often led by what is perceived as cutting-edge medical research done in North America and Western Europe. As diseases and issues more relevant to the third-world countries figure less commonly in the world's medical literature, ironically there is less interest in pursuing them.

Secondly, the distribution of medical manpower within the third-world countries itself is non-uniform. Most of the more qualified doctors tend to remain in urban hospitals catering to the relatively more affluent. The disease distribution and therapeutic issues involved among this affluent minority are not dissimilar to those in the high-income countries.

Thirdly, the type of research done is often influenced by the agency paying for it [9]. Clinical research is becoming more dependent on the pharmaceutical industry for funding. Seventy per cent of the money for clinical drug trials in the United States comes from the industry rather than from the National Institutes of Health [10].

There is even a possibility that the outcome of research may be influenced by the industry. A systematic review of 1140 original studies found statistically significant association between industry sponsorship and pro-industry conclusions (odds ratio, 3.60; 95% confidence interval, 2.63–4.91) [11].

Asthma and allergy in India

There is very little published data on the prevalence of asthma and how it is managed in India [12, 13]. The ISAAC questionnaire-based survey and the ECRHS survey indicate prevalence to range from 3.5% to 17% depending on methodology and definition of asthma used [14, 15].

India is a large country of great variety with regard to geographic and climatic conditions ranging from the tropical to temperate. The population consists of a mix of people coming from a variety of socioeconomic and cultural backgrounds. Literacy levels range from 12% in some states to more than 90% in others [16]. Many large surveys from different parts of the country will have to be done to get a true picture of asthma prevalence and practice in India. Approach to asthma management is more likely to be influenced by cultural attitudes, availability of medication and the purchasing power of the patient. It is estimated that about 10% of the people in India can afford/have access to good-quality asthma care, which includes inhaled medication. However, less than 2% actually use inhaled medication for asthma. This is at least partly due to the low profile given to asthma in national health programs.

India and other low-income countries (LIC) do not consider asthma to be one of their high-priority health concerns for the following reasons:

- (1) Asthma is generally less common in LIC than in high-income countries [17].
- (2) Respiratory infections like tuberculosis are more common and are of greater concern to public health officials, not only because of their morbidity and mortality, but also because of their potential to spread to the rest of the population. The global burden of disease as measured by disability adjusted life years (DALY) lost is 3.4 for tuberculosis and 0.9 for asthma. The DALY for asthma varies from 0.6 in India and sub-Saharan Africa to 1.8 in China [7].
- (3) LIC generally spend about 50–100 US\$ per capita per year in purchasing power parity (PPP) terms on health [1]. Ensuring optimum asthma care for the whole country using current GINA guidelines [18] could divert scarce resources from other important requirements. In India, for example, if the prevalence of asthma is estimated to be 5% and the average cost of asthma medication is about 30 US\$ (PPP) per month, 30% of the entire expenditure on health in the country would have to be spent on asthma medication alone! If the cost of asthma medication were to be reduced, a greater proportion of those with asthma can be expected to benefit.

Attitudes to health and disease in India are greatly influenced by traditional systems of medicine like Ayurvedha and Siddha. One of the key concepts of Ayurvedha is that

diseases are caused by an imbalance in one of the three 'humours' – Kapha (phlegm), Pitta (bile) and Vata (gas) [19]. Asthma is considered to be a disease of 'phlegm' which results from 'cooling food' like cucumber, tomato, oranges and yoghurt, as well as cold weather. It is probably these concepts of traditional medicine that influence the attitude to food among people with asthma in India, including those being treated by allopathy (western medicine). In one survey from Northern India, 88% of parents of children with asthma felt that food was the trigger for their children's asthma [20]. It is interesting to note that it is not just people from India who feel diet is responsible for their asthma; 18.2% of a Navajo Indian population in Arizona, USA, felt the same [21]. Self-reported food allergy has been reported from other countries ranging from 4.6% in Spain to 19.1% in Australia [22].

Notwithstanding these seemingly irrational beliefs and practices of alternative medicine, there is likely to be some with potential benefit as well [23]. Yoga for instance, has been shown to improve lung function in asthma [24, 25]. Further research on some of the more promising practices and medications of alternative medicine might well unearth some important adjuvants to allopathic practice [26, 27]. In any case, the more holistic approach of alternative medicine would seem more acceptable to many asthmatics than a lifetime of medication alone. Asthma guidelines in countries like India would have to address both the negative as well as the positive aspects of alternative medicine.

Guidelines for asthma management in LIC should also include the following:

- (a) Simple algorithms for separating infective from non-infective respiratory illnesses [28].
- (b) Clinical suspicion of asthma to be confirmed with simple objective measurements like PEFR when spirometry is unavailable. PEFR variability has been found to correlate with bronchial reactivity.
- (c) Guidelines on medication should consider what is available, accessible and affordable as well as what is optimum. There is evidence that optimal asthma medication is unaffordable in most low-income countries [3, 4]. Using the minimum number of medication, e.g. oral prednisolone, inhaled beclomethasone dipropionate 250 mcg/dose and inhaled salbutamol should be attempted. Simple clinical and PEFR parameters for recognizing acute severe asthma and treatment approaches according to the level of facilities are available.

Research questions

1. How common is asthma in India and other LIC?
2. How is asthma being treated in India and other LIC?
3. How do respiratory infections influence the diagnosis of asthma?
4. Can a simple 'same size fit all' regimen be developed for asthma in those with the lowest income?
5. Can that regimen be used for COPD, Asthma and post-TB bronchiectasis, safely and effectively when and where these cannot be distinguished easily?
6. Can PEFR meters spread TB?

7. What is the real cost of inhaled medication in LIC (including care giver's time, travel to nearest available center, wastage due to incorrect use, etc.)?
8. What is the best oral regimen available for populations who cannot use/afford inhaled medication?
9. What cost effective methods can be used to educate asthmatics with little or no literacy.

Minimum requirements

The technology to manufacture and distribute the following should be made available to every country in the low-income group without restriction by patent or other laws:

1. mini peak flow meter;
2. rotahaler (simple dry powder inhalational device);
3. beclomethasone 250 mcg rotacap;
4. salbutamol 200 mcg rotacap;
5. tablet Theophylline (long acting) 200 mg.

Conclusion

It is necessary for the practice of modern medicine to be based on sound scientific principles regardless of where it is practised. This is the best and perhaps the only safeguard against arbitrary and potentially dangerous practices. Guidelines, quite rightly, use the evidence available in established literature. But compared to the vast output of research and publications from the developed world, there is little that is available from the low-income countries. This often results in large generalizations and extrapolations from very little data. More surveys and epidemiological research are needed in low-income countries to assess the true prevalence of asthma and the current methods used for its management. But in some countries and situations the need for 'scientific evidence' would have to be tempered by the need for quick and sensible solutions. For a country like India, waiting for scientific evidence may be just another unaffordable luxury. Until sufficient evidence is available we may have to compromise by using just common sense.

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