

OPINION ARTICLE

Childhood asthma in developing countries. Low income aspects and related matters

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INTRODUCTION

Recent evidence indicates that asthma in children from developing regions is as prevalent as in developed areas of the world (1, 2). However, there are striking differences in several aspects of asthma management in children which depend on the level of development of countries where they live. The awareness of asthma, not just at community level but also at health staff level, availability of modern medications, impact of pharmaceutical industries on determining treatment modalities, cultural aspects inherent to each country or region, among others, are all important conditioning factors for global programs on childhood asthma. Thus, several factor should be considered when planning guidelines or statements for asthma management in developing regions of the world, particularly those related to the socioeconomic status of their populations (3). The latter is difficult to interpret because the uneven distribution of the income with very few individuals concentrating the most of the money and a vast proportion of the others with very low income. This obviously results in several well known situations that are inherent to poverty i.e. lower education standards, superficial perception of the importance of disease and symptoms, higher exposition to environmental risk factors, higher prevalence of chronic respiratory infections, larger rates of infantile morbidity and mortality due to acute respiratory infections, unprivileged life conditions, deficient health care, malnutrition, etc. At a higher level of responsibility, very few governments of developing countries have implemented efficient national programs for asthma and this could be an explanation for the virtual absence of reliable registries of asthma morbidity and mortality

(especially in children). This is easy to corroborate by trying to obtain data on morbidity and mortality due to asthma in childhood in countries from developing regions of the world.

Low income populations are also at higher risk for asthma in developed countries, where low socioeconomic status and ethnicity play an important role in asthma death and near-death in some localities (4). In a recent study undertaken school children in Chicago, it was found that asthma prevalence is higher than previously noted, with rates greatest in minority and low income populations. Differences were more striking for measures of severity than for symptoms of wheezing, but are far less than previously reported differences in mortality, suggesting that additional factors, such as differential access to continuous health care, may be affecting high death rates from asthma in Chicago (5). In other study, it was found that insurance category was the most influential factor predicting asthma treatment site, suggesting that economic status may be the most important determinant of higher morbidity (6). Regarding the severity of the clinical picture, it has been reported that asthma hospitalization rate is positively correlated with poverty rate and with the proportion of nonwhite residents and inversely correlated with income and educational attainment (7).

The reported risk factors for asthma in children from developing regions are mainly crowding, tobacco smoke at home, use of kerosene or wood stoves, use of fan turned on for sleeping, living in coastal and humid areas, helminthic infection, sudden temperature changes, weather changes, viral respiratory infections, pneumonia, family history for asthma and other allergic conditions, and air pollution (8-11). Most of these risk factors are clearly related to low socioeconomic status and are very similar to

those mentioned in the literature as risk factors for more severe acute respiratory infections in children. Thus, environmental exposure risk factors for asthma seems to play a major role in the prevalence and severity of asthma in children from developing regions, and also in the burden and severity of acute respiratory infections.

If risk factors for respiratory infections and asthma in infants and children from developing regions are similar then higher rates of acute lower respiratory infections (ALRI) are expected to occur in asthmatic children since very early in their lives. This sort of vicious circle driven by ARI increasing bronchial responsiveness or sustaining it high, what at its time would determine next ARI, or other triggering factors, causing more severe symptoms of bronchial obstruction and lung disease, may explain why both wheezing and ARI are more severe in infants from developing countries. Probably because ALRI is the predominant clinical picture at the time of consultation and diagnosing, this will also be the predominant diagnosis in children and infants who consulted due to ALRI, even when the most of them have or have had clinical evidence of bronchial obstruction at the moment of physical examination. This also happens in older children. A case-control study of patients with pneumonia conducted to investigate whether wheezing diseases could be a risk factor found that wheezing diseases, interpreted as proxies of asthma, were found to be an important risk factor for pneumonia with an odds ratio of 7.07 (95% CI = 2.34-21.36). The risk of pneumonia attributable to wheezing diseases was tentatively calculated at 51.42% (12).

Despite the well known relationship between recurrent wheezing or asthma and pneumonia in infants and children by physicians from developing regions, many of these infants and children with mild to moderate asthma triggered by a viral respiratory infection are unrecognized and treated with medications, usually antibiotic and cough suppressant, that might worsen their condition. As mentioned, the most of these children are registered under the label of acute respiratory infection as final diagnosis what will result in altering the true prevalence of both conditions.

In a birth-cohort study in children from low income population. We have found that the main risk for bronchopneumonia during the first year of life is recurrent wheezing (Mallol, et al, unpublished data). We suggest that recurrent wheezing illness in infants from developing regions is the most important preventable risk factor for pneumonia and death due to ALRI in this group of age. It is worth to remind that about 100.000 of infants under one year

of age die every year in Latin America due to ALRI (13). It has been reported that about 70% of children admitted due to severe ALRI also had symptoms and signs of bronchial obstruction (14). This suggests that better diagnosis and initial management of infants and children with bronchial obstruction could help to decrease the rate of pneumonia and mortality due to pneumonia in children from developing regions.

Education on asthma (particularly diagnosis and treatment) to health personnel (including physicians, nurses, therapist, social workers, etc.) and community, appears as a fundamental task prior to the diffusion of guidelines for asthma management. There are still several countries at developing regions where asthma is grossly under recognized, under diagnosed and under treated, with many of asthmatic children suffering from complications that results in several antibiotic treatments, multiple consultations, admissions, school absence, exercise restrictions, and low life quality for them and their families. Additionally, it should be also considered that unnecessary expenses done in non effective medications decrease even further the low income per year in these families. At present, efforts should be done at the most of developing localities to change asthma treatment from crises-orientated management into a preventive management. Interventions which consider education and training to those involved in asthma care for low-income populations living at developed countries have been undertaken with good success. It has been reported that although effective preventive therapy is available, many African-American and Latino children receive episodic treatment for asthma that does not follow current guidelines for care. Training health staff to provide continuing, and preventive care for asthma, substantially increased their ability to identify children with asthma, involve them in continuing care, and provide them with state-of-the-art care for asthma (15). Relatively low-cost model intervention to control asthma in multiethnic, low-income, inner-city communities (in a developed country) has demonstrated that continuing education, provided to a high proportion of physicians, pharmacists, nurses/respiratory therapists, emergency medical technicians, school personnel, and allied health professionals involved in asthma care resulted in a substantial penetration into the target community improving asthma awareness and actions directed to self-management (16).

There is very few information on this respect from developing countries, however, using international asthma guidelines in low-income asthmatic children in the city of São Paulo, Brazil, there was a notorious decrease in emergency room visits and no need for

hospital admissions. There was also a significant decrease in asthma severity and impairment scores suggesting that combination of good medical care and an educational program can reduce the symptoms of asthma and significantly increase the quality of life, as well as decreasing the costs of asthma treatment (17). Many of these successful initiatives could be also implemented in other developing countries.

The cost of asthma treatment has significantly decreased in the last years with the introduction of generic inhaled bronchodilators and corticosteroids and it is more affordable for some governments to buy and distribute these MDI medications for free at the primary care level. In Chile, during the last decade salbutamol, beclomethasone and spacers are available for free to infants and children from low-income populations who need to be treated with such medications. At the same time the ARI program has several centers with trained chest therapist to recognize and do the first treatment to infants and children with acute bronchial obstruction. The health impact of the ARI Program seems to be very important, especially in decreasing infant mortality due to acute respiratory infections. Recently, it has been reported a decrease in the rate of mortality due to pneumonia in infants under one year from 3.0/1000 to 1.7/1000 in a 4 years period (18).

However, in the most of developing countries no modern medication to treat asthma is provided by public health system because it still results expensive. In order to get good medications, patients have to buy their treatment what many times is just impossible for them to do. At present, the approximate monthly cost for covering MDI beclomethasone 400 mcg/day and salbutamol 200 inhalations, and the spacer, is about 25 US\$ when using generics, and 75 US\$ when using originals. However, the former 25 US\$ represents about the 5% to the 30% of the basic salary (or more) at some developing regions. Then it is quite easy to understand that these patients will look for and receive a crisis-based treatment that is usually free at emergency rooms in hospitals pertaining to the public health system. The savings derived of stopping to buy ephedrine, oral aminophylline, cough suppressants; the savings derived of the expected decrease in admissions and emergency rooms consultations due to asthma when adequate preventive treatment is employed by patients; and the savings derived from improving education on asthma management to health staff, will for sure provide with enough funds to get effective asthma medications for patients looked after at the public health systems.

Another very important matter, probably related with low income, is the lack of reliable registries for asthma morbidity and mortality in many of the countries from developing regions. Authorities' responsibility can not be overlooked and international institutions of health should also direct efforts to convince governments to implement asthma programs with good registries at these localities. At present the chronic lack of data on emergency room visits, admissions, consultations, treatment modalities employed, age-related aspects, economic status influence, etc., do not allow for valid comparisons with developed regions, neither with other countries at similar level of development. Under these conditions it seems superficial and difficult to determine what would be the best asthma management in children in those countries.

Education strategies should also be directed to convince health authorities that it is cheaper treating asthma with currently available preventive medication than spending much larger amount of money in old unsafe medications, antibiotics, cough medications, admissions, and so on... Probably establishing pilot asthma programs would help to get convincing economic and medical evidence. The good experience of ARI Program in Chile that it is effective, saving-money and perhaps with some modifications it might be oriented to asthma in children and taken as a module to reproduce in some other developing countries.

Key words: Childhood asthma socioeconomic aspects. Developing countries.

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