Title
Healthy Environment, Healthy Children, and Healthy Future: You Take My Breath Away

Permalink
https://escholarship.org/uc/item/2869q9nz

Journal
Electronic Green Journal, 1(14)

ISSN
1076-7975

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Publication Date
2001-04-01

Peer reviewed
Having introduced this three part series on children's health and the environment in my previous column (EGJ 13, December 2000), this issue will focus on the air we breathe and the impact of environmental agents on the respiratory illnesses of children. My next and final column in this series will focus on environmental hazards, such as pesticides, and the danger they present to children, along with recent efforts to introduce organic agricultural programs in an urban setting, with an emphasis on the educational opportunities these programs present to elementary schools in some of our largest cities.

The more we study, the more we find that we don't understand. This is certainly the case with respiratory diseases, such as asthma, and allergies, which afflict a growing number of individuals in developed as well as developing countries around the world. The list of references included at the end of this column is only the tip of the iceberg, but indicative of the significant research investment that has been made in search of a cure for asthma and allergies over the past 50 years. Yet, many of the questions about allergies remain unanswered. What causes allergies? Why are they more common than ever? Will a cure ever be found?

Grand claims to have found the "answers" to these problems are frequently oversimplifications based on unsubstantiated generalizations. The complexity of these diseases makes finding a cure one of the most daunting tasks facing the medical profession as we step into the 21st century. Asthma alone is influenced by the following factors: age, gender, genetics, pollution, allergies, economics, race, house dust mites, ozone, anxiety, life style, stress, cockroaches, temperature, moisture, smoking, obesity, physical activity, cats, dogs, acid reflux, viral infections, emotions, and pollen. Any suggestion that by addressing only one or two of these factors asthma relief will be forthcoming reflects little understanding and appreciation of reality.

Asthma is the most severe and widespread respiratory disease afflicting today's children. It is becoming more common and it is the leading cause of school absenteeism. Therefore, asthma will be the focus of our discussion and serve to represent environmentally induced respiratory or allergenic
maladies that are especially problematic for children. The scope of the problem has grown to alarming proportions, for reasons that are not well understood (Table 1). While a single definition of asthma, applicable to all cases, is not available, let us use the following description. Asthma is characterized by an intermittent, reversible airway obstruction, occurring as a result of chronic airway inflammation and hyper responsiveness to a variety of stimuli (Etzel & Balk, 1999). Representative information sources from the news media, scholarly research literature, popular medical books, and Web sites will be examined to shed some light on this growing medical problem.

**Asthma Basic Statistics (Asthma in America Survey).**

- **Americans with asthma:** 14.6 million
- **Children with asthma:** 4.8 million children under age 18
- **Asthma prevalence:** 5.4% of Americans reported having asthma in 1994, a 75% increase since 1980
- **Asthma prevalence in pre-school children:** 5.8% of children under age 5 had asthma in 1994 (as reported by a family member), a 160% increase since 1980
- **Asthma deaths:** more than 5,000 each year
- **Asthma-related hospitalizations:** 466,000 in 1994
- **Emergency room visits for asthma:** 1.9 million in 1995
- **Healthcare costs for asthma care:** estimated at more than $6 billion a year
- **Missed schooldays:** more than 10 million a year
- **Loss in productivity by working parents caring for children who miss school due to asthma:** an estimated $1 billion a year

Table 1.

**Making the News**

Mark Henle (2001) of the *Arizona Republic* newspaper recently ran a series of street wise articles on the daily struggles faced by asthmatic school children and farm workers in southern Arizona. The interplay and drama of feeding your family and finding affordable medical treatment for asthma between U.S. and Mexican doctors is not something you see in the peer reviewed medical literature. He described long rides to the fields in smoke-filled buses and how school children from the poorer side of town negotiate daily with siblings and school nurses for hits from their inhalers. For some, the cultural and economic traditions of many generations have locked them into a cycle
of asthma attacks, a cycle that won't be broken with a simple trip to a primary care physician or a drug store. The escalating rates of asthma and the most severe cases are more likely to be found among the poor. Confusion, illiteracy, and lack of health insurance trap many children into a life of wheezing and gasping for air when 98% of these symptoms could be controlled with proper medications, education, and lifestyle adjustments. In order to simulate the chore of breathing during an asthmatic episode, hold your nose and breathe through a small cocktail straw. Now bend the straw in half to simulate a severe attack. "Asthma doesn't rank with cancer or car accidents as the killer of kids. Instead, it steals their childhoods." Even the simple task of climbing a flight of stairs could prove to be a huge ordeal under such circumstances, a condition that some of these children face week in and week out.

**Popular Medical Books**

Parents have a choice in how they manage asthma in their family. They can wait for the symptoms to become severe and utilize the services of a hospital emergency room or they can play a proactive role in keeping the asthma in their family under long-term control. Dr. Michael Welch (2000) edited the *Guide to Your Child's Allergies and Asthma* for the American Academy of Pediatrics and it fits well into the latter management strategy. This small book is an easy read, yet it offers parents solid advice and practical help so their children will "breathe easy" and grow up living more active, healthier lives. It answers questions about asthma at school, adolescence, athletics, infants, and toddlers in a comprehensive manner that will surprise many readers suffering from respiratory illnesses. David Hoffmann (2000) goes a step further by presenting natural remedies to solve our problems with nature. His book *Easy Breathing* begins with an explanation of how we breathe followed by a wide assortment of herbal treatments for asthma, other respiratory problems, and allergies. Hoffmann talks about how to create your own herbal remedies and when you should see a doctor. *Clearing the Air* by the Institute of Medicine, on the other hand, may find itself used more as a doorstop than a family guide to managing asthma in the home. Its treatment of asthma and indoor exposures is among the best available, however, the detail, language, and specialized coverage will be most useful to researchers and medical professionals rather than parents seeking practical help for their gasping children.

**Scholarly Research**

The complexity of asthma and allergies has led to some contradictory conclusions as researches have sought to understand these
diseases. Brunekreef (2000) found a very close relationship between pollen counts and deaths due to cardiovascular disease, chronic obstructive pulmonary disease, and pneumonia in the Netherlands. Sears (1997), on the other hand, had little to say about pollen in his article on the epidemiology of childhood asthma. He pointed out that:

Despite several carefully worded statements during the past decade, we do not have a definition of asthma that is applicable in all cases, even in childhood. This difficulty reflects not only the lack of a single biological marker or clinical test for asthma but also the variable expression of symptoms.

Careful research has also called into question some commonly held beliefs. For example, allergens such as pollen or house dust mites are often implicated as causing asthma. Yet, Jarvis (1998) has pointed out that as allergies increased in Britain, grass pollen counts declined over a 20-year period. Additionally, Kitch, Chew, and Burge (2000), and Lau (2000) raise doubts about the relationship between allergens and asthma. Barrett's article, "Socioeconomic predictors of high allergen levels in homes in the greater Boston area" states that:

Some researchers have postulated that increased burden of asthma experienced by inner-city and low-income groups is at least partly attributable to a greater burden of allergen exposure among poor inner-city minority populations. Although this may still prove true, our study showed that not all allergen levels are higher in the high poverty areas.

Lau (2000) concluded that her data did not support the hypothesis that exposure to environmental allergens caused asthma in childhood. What role does genetics play in all this? This too, is unclear. Ono (2000) establishes the important influence of genetics on the development of allergies. However, Jarvis (1998) states that it is unlikely that "the increase in allergic disease over the past few decades can be explained by genetic factors." Brown (1997) echoes this sentiment.

**Web sites**

The National Library of Medicine produces a variety of helpful resources for those who find breathing, at times, quite a chore. However, one of the more captivating resources they have produced is the Web site *Breath of Life*. Here you will find some unexpected fellow sufferers who have overcome asthma. Their success stories are sure to inspire anyone suffering from this disease. The site needs work with regard to basic navigation and editing, but the content and graphical elements of the site make it worth a
visit. The history of asthma is presented along with a discussion of contemporary issues. The personal struggles presented do an excellent job of putting a human face on this electronic interface.

The Asthma and Allergy Foundation of America (AAFA) is a patient organization seeking to improve the quality of life for the millions of individuals suffering from asthma and allergies across the United States. Founded in 1953, the AAFA has funneled $12 million into asthma research during the past 15 years and offers members educational resources and support groups distributed throughout 13 local chapters. Their Web site boasts a kid's zone where you can test yourself on asthma knowledge with a colorful, interactive game. Questions may be submitted to an allergist and a section is available for the health care professional. Consumers will find helpful information on asthma, patient care issues, research highlights, news, and features such as a special report on how much asthma costs the U.S. Some parts of the Web site are also available in Spanish.

Hot spots of asthma activity, such as Arizona, offer new, localized information resources from the perspective of a good neighbor. If the area in which you live is home to many who suffer from respiratory diseases, chances are that local hospitals and support groups are equipped to help manage the disease. Arizona, once thought to offer relief for asthma sufferers, now ranks fourth in the nation in the number of asthmatics who live in the state. The Arizona Asthma Coalition's Web site is quite well done, yet several sections remain undeveloped. The vision of the Coalition is to eliminate deaths from asthma in Arizona. Their Web site will certainly contribute to this vision, offering practical help on controlling common causes, and organizing support groups and asthma camps, plus providing information about the Breathmobile from Phoenix Children's Hospital.
In spite of the significant amount of research work that has been done on asthma and allergies over the past 50 years the disease is spreading and getting worse, especially among children and the poor. A reasonable explanation for these trends has not been forthcoming but increasing urbanization and a decline in environmental quality are probable factors. A solid solution to such complex problems has eluded science, thus far. Either science needs more time or the answers lie beyond the scientific community. Will science come up with a solution in this generation? Don't hold your breath. You will surely need it.

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