Asthma and Chronic Bronchitis in Africa
Evidence from Epidemiologic Studies

Pierre Chaulet, M.D.

Non specific disorders, such as asthma and chronic bronchitis, are the most common and the most important chronic airways diseases (CAD). They are the major cause of chronic respiratory insufficiency in Africa as well as on other continents. Although clinicians diagnose each disease separately, it is sometimes difficult to distinguish one from the other, especially in children and in adults over 40 years of age. For epidemiologists, this overlap presents problems, because they require simple and conventional definitions to identify, within the community and by means of standardized questionnaires, subjects with functional disorders (cough, sputum, dyspnea). Nevertheless, for nearly the past 10 years, accurate epidemiologic surveys have been conducted in several African countries. Although the methods applied sometimes differ, and although an exhaustive review could not be carried out, the data published in the literature permit an assessment of the magnitude of the problem created by both nonspecific diseases under study: asthma and chronic bronchitis.

Africa and its Population

The African population in 1987 was about 580 million, unevenly distributed as follows: (1) 130 million in Northern Africa and the Nile Valley; (2) 350 million in Sahelian, tropical, and equatorial Africa; and (3) 100 million in south- and Southern Africa, and in the Indian Ocean isles. This is a young population, of which 50-57% are under 20 years old (under 5 years old alone account for 20%), and only 10% are over 50 years old. This population structure, associated generally with low income in most countries, is the reason why acute respiratory infections and tuberculosis have been and remain top priorities in African health activities.

Rapidly increasing, and often uncontrolled, urbanization, as well as expanding mining and processing industries, have multiplied the environmental factors encouraging the development of nonspecific airways disease. These diseases cause a real public health problem because of their frequency and their medical and social cost.

Asthma

Prevalence

Surveys of the prevalence of asthma have been conducted in various population groups: national representative samples, general district population, school children, and young recruits. The most commonly used method was by questionnaire (BMRC, CECA, ATS questionnaires, or specific questionnaires adapted and translated for local use). These were completed by the subjects enrolled in the study or their parents, by examiners, or occasionally by physicians. In a few surveys, the “cases” identified by questionnaire were controlled by means of a second inquiry during medical examination, by respiratory function tests, or sometimes by both.

Data collected in 10 African countries are shown in Table 1. A strict comparison of observed prevalence rates is hindered by the variety of methods used. In most cases, asthma prevalence ranges between 2 and 5%, as shown by questionnaire surveys among representative samples of schoolchildren. This rate is generally rounded off to a lower figure if, in a given population, other diagnostic criteria are incorporated after medical examination or function tests. But even when the same criteria are applied countrywide, large regional differences can be observed: such as in Tunisia, where the national survey yielded a mean prevalence of 2.3%; but the prevalence was 2.3% in the north, 1.9% in the center, and 3.1% in the south. Similarly, in Algeria, where young recruits have a 2.0% prevalence, there is a 0.8% prevalence in recruits from the mountain areas vs 5.5% and 4.4% in recruits from urban areas along the coast or in the plains, respectively.

A preponderance of males is often reported, especially in

Chronic Airways Disease

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Table 3—Importance of Chronic Bronchitis Among Morbidity Observed in the Health Services of Several African Countries

<table>
<thead>
<tr>
<th>Population Under Study</th>
<th>No. of Subjects</th>
<th>Compared to no. Attenders/Inpatients</th>
<th>Chronic Bronchitis, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simple Bronchitis</td>
</tr>
<tr>
<td>Algeria</td>
<td></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Patients admitted in specialized departments in 1982 (national survey)</td>
<td>5,506</td>
<td>5.5</td>
<td>55</td>
</tr>
<tr>
<td>Outpatients, Pneumology Dept. in 1983-84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sétif</td>
<td>1,533</td>
<td>3.1</td>
<td>7</td>
</tr>
<tr>
<td>Rouiba</td>
<td>968</td>
<td>3.3</td>
<td>33</td>
</tr>
<tr>
<td>Madagascar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All services</td>
<td>2.9</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Chest services</td>
<td>36</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Outpatients in health services</td>
<td>13</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Togo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatients in Lome Chest Dept.</td>
<td>4,640</td>
<td>8.2</td>
<td>93</td>
</tr>
<tr>
<td>in 5 yr (1980-84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in 2 yr (1984-85)</td>
<td>1,400</td>
<td>7.7</td>
<td>93</td>
</tr>
<tr>
<td>Tunisia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatients in specialized services in 1980-82</td>
<td>11</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>(716 cases analyzed)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Women are less frequently affected than men, although a high prevalence (15%) was noted in rural Tunisian women aged 20–50 years (Table 2). The prevalence of chronic bronchitis generally increases with age; eg, it was 7.4% in the 20–30-year-old age group, 15.2% in the 41–50-year-old age group, and 23.3% in 51–60-year-olds in Tunisia.\(^\text{a,a}\) The prevalence is also significantly higher in smokers than in nonsmokers,\(^\text{a,a,e^-e,a}\) as well as in women taking snuff compared with those who do not.\(^\text{a}\)

An effect of exposure to air pollution at work on the prevalence of chronic bronchitis has been found in Morocco in subjects employed in the cement works (but not in those working in chemicals and other industries);\(^\text{a}\) in chrome ore miners, regardless of smoking habits in Sudan;\(^\text{a}\) among smokers exposed to occupational nuisance (ie, in cork or earthenware factories and in the tobacco industry in Tunisia);\(^\text{a,a,e^-e,a}\) and among flour mill and foundry workers regardless of the smoking factor and the risk of pneumoconiosis in South Africa.\(^\text{a,a}\) In these cross-sectional surveys, chronic obstructive bronchitis was identified by function tests in 21–65% of all chronic bronchitis cases.\(^\text{a,a}\)

**Rates**

Reported rates of observed morbidity in health services are of limited epidemiologic value because diagnostic criteria and complaints motivating clinic attendance and hospitalization are recorded according to varying methods and by persons with widely different qualifications; further, the development of health services varies considerably from country to country, as well as within the countries themselves among different provinces and districts. Data gathered in Table 3 show nonetheless that chronic bronchitis appears both as a reason for clinic attendance and as a diagnosis warranting hospital admission in several countries.\(^\text{a,a}\)

A majority (55–93%) of cases of chronic bronchitis diagnosed in specialized clinics or pneumology services suffer from chronic obstructive bronchitis. The bronchial obstruction is usually demonstrated by pulmonary function tests. In Tunisia\(^\text{a}\) 35% of inpatients also have chronic cor pulmonale. There is a male preponderance, except in Madagascar:\(^\text{a}\) 63% in Algeria;\(^\text{a}\) 70–72% in Togo;\(^\text{a,a}\) and 81% in Tunisia.\(^\text{a}\) Some 60–80% are smokers. Overall, chronic bronchitis cases examined in specialized clinics or admitted into hospital suffer more frequently from severe dyspnea or chronic obstructive bronchitis than those observed in the context of community cross-sectional surveys.

**Discussion**

The data presented in this report, although fragmentary, show that asthma and chronic bronchitis exist in Africa: 2–10% of the children, adolescents, and young adults present each year with one or more asthma crises; 10–20% of adults aged over 20 years, and 15–30% of adults aged over 40 years present with signs of chronic bronchitis. The differences in the prevalence rates observed in the above-mentioned surveys may be explained by a number of factors; the most important is methodology, but environmental and possibly genetic differences may contribute. To compare various prevalence surveys, it would be necessary to use a standardized questionnaire (after having checked the quality of the translation against every local cultural context) as well as simple but accurate pulmonary function tests during descriptive surveys. To identify with greater accuracy the causes or factors influencing any observed differences in prevalence, it would also seem necessary, in general, to improve the methodology of epidemiologic surveys\(^\text{a,a}\) and to
develop community rather than inpatient surveys.

Due to their frequency and social and medical cost, asthma and chronic bronchitis are a mounting problem for the health staff among the many public health problems in Africa. However, except in a small number of countries, these problems have a lower priority than acute respiratory infections or tuberculosis.

Against acute respiratory infections, (ARI), especially in children, there is an educational and health action program designed to reduce child mortality due to obstructive laryngitis, acute bronchitis, and pneumonia through vaccination, early diagnosis, and adequate care, and to reduce health costs by making more rational the prescription of antibiotics and the indications for hospital admission.

Against tuberculosis, a modern and realistic national program integrated into primary health activities at district level can reduce the prevalence of the disease as well as, within a few years, the incidence of infectious tuberculosis, provided there is total, country-wide coverage by codified and standardized case-finding and treatment.

In contrast, the problems of asthma and chronic bronchitis seem less susceptible to health care action. Health staff share the feeling, although rarely confirmed by exact data, that these diseases are on the increase. General preventive measures, such as tobacco control and home or occupational pollution control, although necessary, are unevenly applied. Curative measures (early diagnosis of bronchial obstruction, prevention and treatment of acute respiratory insufficiency) do not contribute to reducing morbidity, even if they reduce mortality and increase life expectancy. There is still a great need to assess the magnitude of the problem, identify risk factors and risk groups, and implement rational and realistic use of available means.

Standardized programs to conduct surveys aimed at identifying persons who suffer from asthma and bronchitis and to direct these persons to health services for treatment should be set up on the basis of the needs of each individual country.

CONCLUSION

Prevalence surveys are needed in each African country to assess with greater accuracy the magnitude of the asthma and chronic bronchitis problem. These surveys are the first step in a specific program, which currently has second priority in African health action programs after ARI and tuberculosis programs.

Asthma and chronic bronchitis exist in Africa, but their exact prevalence is not known, nor can comparisons be made among countries, because of differences in the methods used in the surveys carried out to date.

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REFERENCES

3 Gregg I. Epidemiological research in asthma: the need for a broad perspective. Clin Allergy 1986; 16:17-23
7 Guermaz M, Ouslim M, Guessa L, Zirout A. Asthme en milieu saharien. Rev Fr Allerg 1985:1
10 Bahma S. PhD thesis. University of Alexandria, 1970
11 Godfrey RC. Asthma and IgE levels in rural and urban communities of the Gambia. Clin Allergy 1975; 5:201-07
21 Merret TG, Merret J, Cookson JB. Allergy and parasites: The measurement of total and specific IgE levels in urban and rural communities in Rhodesia. Clin allergy 1976; 6:131
Epidemiologic Studies of Chronic Respiratory Diseases in Some Regions of China

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In the early 1970s, after most acute infectious diseases had been brought under control, the Ministry of Public Health of China began studies of the epidemiology of chronic respiratory diseases. Among the subjects studied were chronic bronchitis, emphysema, and chronic cor pulmonale. Of these, cor pulmonale, the most frequent causes of which are chronic bronchitis and emphysema, was investigated most intensively; 5 national conferences were held between 1973-87, with emphasis on improvements in diagnosis and treatment.

STUDY COMPONENTS

Surveys of Chronic Respiratory Diseases

Surveys were the major epidemiologic method by which the prevalence of chronic respiratory diseases was determined. Generally, surveys were carried out by special teams appointed by the Ministry of Public Health, but some local hospitals also organized surveys. Beginning in 1971, 2,680,957 persons were surveyed for chronic bronchitis in Shanghai, and 80,414 cases of chronic bronchitis were found, a prevalence rate of 3.0%. Among these persons with chronic bronchitis, 46,692 (50.03%) were over 50 years of age. During the 1970s, surveys of the prevalence of chronic respiratory diseases were conducted in many regions of China (Table 1). In most instances, all inhabitants over the age of 14 were included in the surveys. Exceptions are surveys in the provinces He-bei and Qing-hai, where the lower age limits were >10 and >20 years, respectively, and Yunnan province, where the whole population was included in the survey.

Influence of Age

The prevalence rate of chronic respiratory diseases in-