Epidemiology of Leprosy in Rio Grande do Sul, Brazil, 1975–1980

General Data

The State of Rio Grande do Sul has a population of 7,776,000 inhabitants and covers a surface area of 282,000 km². Since 1938, when the first patient registers were established, the State-Government agencies have been responsible for leprosy control. Up to 1954 control was based on a law requiring the compulsory hospitalization of all leprosy patients throughout the country. When the law was repealed in that year, greater emphasis was given to outpatient treatment under the responsibility of the federal government. In 1964 control was delegated to the Ministry of Health and the Environment of Rio Grande do Sul.

Today leprosy patients are treated through a network of health units of the above-mentioned Ministry (about 400), which covers 16 regions and 232 municipalities in the State. For every two regions there is a medical officer who supervises the health dermatology programs and provides the physicians of the local units with technical support, and in 22 of the health units there is a dermatologist. The Health Dermatology Team prepares the technical standards and centralizes the information provided by the local units. Since 1975 the register of patients and contacts has been maintained by means of a computerized system, which makes it possible to administer the program much more quickly and at the same time provides access to data for epidemiological studies.

As of 31 December 1980, there were 3,265 registered cases of leprosy in Rio Grande do Sul, which represents a prevalence rate of 0.42 per 1,000 population.

The epidemiological behavior of the disease from 1975 to 1980 is analyzed below.

Incidence

In the period 1975–1980, a total of 1,435 new cases of leprosy were diagnosed, that is, an annual rate of 3.19 cases per 100,000 population (Table 1). In 1976 and 1977 there was an increase in the number of new cases because of the delayed notification of cases diagnosed in earlier years by private practitioners. The active register also included 140 cases from other states, 31 cases were relapses of the disease, and another three were cases included for a second time, which made a total of 1,609 new cases registered in the period (Table 2).

The predominant clinical forms were lepromatous (702 cases) and tuberculoid (462), followed by indeterminate (224) and dimorphous (221).

The distribution by sex showed a similar incidence in the two groups, 725 cases in males and 710 cases in females. The data appear to indicate that, although the risk of contracting leprosy is similar in the two sexes, the proportion of individuals with natural resistance is higher among males.

There was a marked predominance of incidence in the higher age groups, which shows that the risk of contracting the disease increases with age (Figure 1). Only 3.55 per cent of the cases diagnosed occurred in children under 15 years of age, which appears to confirm that Rio Grande do Sul is not a highly endemic area.

Prevalence

Between 31 December 1974 and 31 December 1976, the prevalence rate fell from 0.47 to 0.42 cases per 1,000 population because of the elimination of a large number of cases by death.
Figure 1. Leprosy incidence rate, by age groups, Rio Grande do Sul, Brazil, 1975-1980.

Since 1976 the prevalence rate has stood at 0.42 per 1,000, which shows that the number of cases registered increases in proportion to the population of the State (Table 3).

Control of Patients

In accordance with the criteria adopted by the National Health Dermatology Division of Brazil, leprosy patients meeting the following conditions are considered to be cases under control:

1. Those with the indeterminate clinical form, with negative Mitsuda, and those with the lepromatous or dimorphous form that have been examined at least once in the previous twelve months.

Since 1975 there has been a gradual improvement in the general control percentages which by 31 December 1980 reached an index of 85.7 per cent for the lepromatous and dimorphous forms, 77.1 per cent for tuberculoid forms, and 76.6 per cent for indeterminate forms (Table 4).

Discharges. Between 1975 and 1980 a total of 1,655 leprosy patients (a slightly higher number than that of admissions to the register in the same period) were removed from the active register for the following reasons: cure, 644; death, 340; movement to other states or countries, 220; and statistical adjustments, 361.

Hospitalization. In 1975 a campaign was begun with the general hospitals to have them hospitalize leprosy patients with clinical and surgical problems that required ongoing attention. As a result, the number of general hospitals that agreed to admit leprosy patients rose from two to 43, and the annual average number of hospitalized cases, which was 50 up until 1974, fell to 10 a year in the period 1975-1980. The average number of hospital discharges either for death or for transfer of the patient to outpatient treatment remained at around 30 cases annually during the period. The number of hospitalized patients fell from 343 on 31 December 1974 (10.4 per cent of the total number of patients registered) to 210 by 31 December 1980 (6.4 per cent).

Table 3. Leprosy prevalence in Rio Grande do Sul, Brazil, 1974-1980.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases in the active register by 31 December</th>
<th>Rate of prevalence per 1,000 population</th>
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<tbody>
<tr>
<td>1974</td>
<td>3,311</td>
<td>0.47</td>
</tr>
<tr>
<td>1975</td>
<td>3,115</td>
<td>0.43</td>
</tr>
<tr>
<td>1976</td>
<td>3,056</td>
<td>0.42</td>
</tr>
<tr>
<td>1977</td>
<td>3,096</td>
<td>0.42</td>
</tr>
<tr>
<td>1978</td>
<td>3,143</td>
<td>0.42</td>
</tr>
<tr>
<td>1979</td>
<td>3,195</td>
<td>0.42</td>
</tr>
<tr>
<td>1980</td>
<td>3,265</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Table 4. Percentages of leprosy cases under control, classified by clinical type, Rio Grande do Sul, Brazil, 1975-1980.

<table>
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<tbody>
<tr>
<td>Lepromatous and dimorphous</td>
<td>77.6</td>
<td>81.9</td>
<td>80.9</td>
<td>84.5</td>
<td>85.6</td>
<td>85.7</td>
</tr>
<tr>
<td>Tuberculoid</td>
<td>68.0</td>
<td>74.2</td>
<td>76.1</td>
<td>75.7</td>
<td>75.7</td>
<td>77.1</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>66.9</td>
<td>68.3</td>
<td>70.3</td>
<td>74.3</td>
<td>76.0</td>
<td>76.6</td>
</tr>
<tr>
<td>Total</td>
<td>74.0</td>
<td>78.7</td>
<td>78.8</td>
<td>81.8</td>
<td>82.9</td>
<td>83.5</td>
</tr>
</tbody>
</table>
Control of contacts

On 1 July 1977 the general register of household contacts of leprosy patients was put into the computer. By 31 December 1981, of the 3,265 patients on the active register, 2,454 had their contacts registered. The total number of contacts registered was 6,636, or an average of 2.7 contacts per patient; that figure is less than that of the average family size in Rio Grande do Sul (an average of 4.9 persons per household, according to the 1970 census), which would give 3.9 contacts per patient, since there are frequently two or more cases of leprosy in the same family.

By 31 December 1980 the number of contacts of patients with the lepromatous or dimorphous form of the disease was 4,881; of these, 1,337 (27.4 per cent) were under control. Since only 77.7 per cent of the patients with these forms of the disease had registered contacts, the actual control percentage may be estimated at 21.3 per cent (27.4 per cent \(\times\) 77.7 per cent). Likewise, the effective general control percentage of contacts is estimated at 18.7 per cent.

(Source: Ministry of Health and the Environment, Rio Grande do Sul, Brazil.)

Editorial Comments

Leprosy is an endemic disease in almost all the countries of the Americas. According to reports received by PAHO, there are about 257,000 registered cases but the actual total is estimated to be around 450,000. The geographical distribution of the cases is not uniform; there is a tendency for them to be concentrated in well-defined foci where the morbidity rate may be as high as 10-30 cases per 1,000 population.

The areas most affected are in the Amazon subregion (including parts of Bolivia, Brazil, Colombia, and Peru); the Caribbean (French Guiana, Guyana, Suriname, and several of the islands); and some areas in the Southern Cone countries. The following outstanding epidemiological characteristics are to be noted:

1. With few exceptions, half the cases diagnosed are infectious.
2. Prevalence in the age group 0-14 years is less than 15 per cent.
3. Up to the 1950s, about 70 per cent of the cases reported were from rural areas (scattered communities with fewer than 2,500 inhabitants). At present the situation is the reverse, owing to the immigration of patients to the large cities.

If only the absolute number of cases and the morbidity rates are taken into account, leprosy would not be a priority public health problem. However, the extent of the problems is increasing because of the following factors inherent in the disease:

- Its chronic course: cases of the disease with the most favorable course (incipient cases) are only discharged as cured after a minimum of five years and the more advanced cases need treatment and epidemiological surveillance for many more years.
- In addition to being communicable, leprosy is a disabling disease since it involves the peripheral nervous system, and neuritic lesions may be aggravated even in "cured" cases, if they are not carefully treated. About 30 per cent of the patients have some kind of incapacitating lesion.
- Culturally or socially leprosy has been associated with a stigma that prevents the patients from being accepted in their community and causes them to be rejected even by the healthy members of their own family. This attitude is irrational, yet compulsive, and exists in all strata of the population, even among physicians, and is the most serious limiting factor or obstacle in the application of control measures.

In the past, control of the disease was based on the isolation of patients in leprosaria, that is to say, on segregating the sources of infection. Later it was found that this measure was counterproductive since it encouraged the concealment and dispersion of patients, even to communities free of the disease; it accentuated the existing stigma, and when the cases were diagnosed and isolated, most of them had already infected other persons.

In the 1940s treatment with Dapsone (D.D.S.), a drug that proved effective, was begun, and the emphasis of control policy was directed towards outpatient treatment. Subsequently it was found that monotherapy with D.D.S. favored the development of resistant strains and, consequently, the treatment of patients with more than one drug at the same time, preferably a bactercidal drug, was recommended.

At present, the policy recommended by the International Congresses on Leprology and by the WHO Expert Committee on Leprosy is based on the secondary prevention of the disease, that is to say, detection and locating of cases, treatment with a combination of drugs, and epidemiological surveillance for ensuring regular medication. Follow-up of the cases includes prevention and treatment of incapacitating lesions.

The implementation of this simple and rational policy depends on certain strategies that are summarized below:

- Use of the general health services, primarily at the primary care level, for the detection and treatment of cases. Activities for the prevention of disabilities, which are simple techniques that can be carried out at any level.
- Allocation of the necessary resources (staff time and logistic elements) in accordance with the importance of the problem in well-defined foci.
- Appropriate training of personnel and development of their decision-making capacity to establish priorities in health problems.
- Strengthening of the supervision and operational and epidemiological information mechanisms.
Reports of Meetings and Seminars

Meeting of the Advisory Study Group on Chronic Rheumatic Diseases

Chronic rheumatic diseases are a public health problem because they frequently require outpatient treatment and prolonged hospitalization and produce a lasting and progressive disability which affects important core groups in the active population.

To discover certain epidemiological features of these diseases which may serve as the basis for subsequently programming control measures, PAHO is coordinating a collaborative study designed to investigate aspects of the patients treated by rheumatology services in Latin American countries.

Centers in Argentina, Brazil, Chile, Mexico, Uruguay, and Venezuela participate in the study which was begun in 1977 with a view to keeping track of the patients for five years. The elements being investigated include the extent of disability and dependence produced by these diseases, their impact on work both on the job and at home, and the demand for medical services.

The IV Meeting of the Advisory Group on Chronic Rheumatic Diseases was held at PAHO Headquarters in Washington, D.C., from 21-23 October 1981. It reviewed the progress of the study and planned future activities, including the preparation of practical recommendations for an improved treatment of certain musculoskeletal conditions that are a frequent reason for consultation in the general health services. These recommendations, directed to physicians who are not specialists in this field and to nurses, will make a useful contribution to the extension of coverage by facilitating better treatment of rheumatic patients in the general health services.

Seminar on Immunodiagnosis in Malariology

The Seminar, sponsored by the Mérieux Foundation and WHO, was held in Lyon, France, from 9-12 September 1981. Its purpose was to review recent progress in the field of malaria immunology and the use of immunodiagnostic serologic tests in the epidemiological study of malaria.

Some of the most important aspects discussed are dealt with below.

Immunological diagnostic tests in malaria

Several serologic tests have been used in the study of malaria, including the following:

- Indirect immunofluorescence (IIF).
- Immunoelectrophoretic analysis (IFA).
- Passive hemagglutination (IHA).
- Enzyme-linked immunosorbent assay (ELISA).
- Radioimmunoassay (RIA).

The indirect immunofluorescence test (IIF) has been the most widely used in field work. Its sensitivity is acceptable and it is at present the preferred method. The use of homologous antigens makes it possible to recognize specific antibodies. Good quality reagents are available, although the equipment for carrying out the test is expensive and well-trained technical personnel are necessary.

Immunoelectrophoretic analysis techniques including the agar-gel diffusion test (Ouchterlony technique) and counterimmunoelectrophoresis are sensitive for analyzing malaria antibodies and antigens, but are of limited use in field work. The tests require large amounts of homologous antigen which is generally in short supply and also of limited stability. However, the Ouchterlony technique has proved to be much more useful in the laboratory for the antigenic analysis of immune sera of adults infected with *Plasmodium falciparum* in hyperendemic areas. The recognized antigens are categorized according to their thermal stability as labile (L), resistant (R), and heat stable (S) antigens. The S antigen may in future be used to identify serotypes of *P. falciparum* but additional studies are required in this field.