LEISHMANIASIS CONTROL STRATEGIES

A CRITICAL EVALUATION OF
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La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.
Leishmaniasis control strategies
Leishmaniasis control strategies: A critical evaluation of IDRC-supported research

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PANEL DISCUSSION #1:

"Leishmaniasis as a Public Health Problem and How it is Addressed Nationally"

Policies and Health Programs for the Study and Control of Leishmaniasis in Colombia

By Marcos Restrepo⁠¹

In Colombia, leishmaniasis has been considered a clinical entity since 1872, even though the parasite that causes it was isolated in 1929, taken from material coming from a mucous ulcer. The first reports recorded in Colombian medical literature refer to clinical descriptions of cutaneous and mucocutaneous lesions. The first case of visceral leishmaniasis was described in 1944.

American Tegumentary Leishmaniasis (ATL), is a zoonotic endemic disease widely spread in Colombia but generally considered of little importance in public health, due to several factors:

a) health teams lacked knowledge about the disease;

b) health units found it difficult to give an accurate diagnosis;

c) patients’ lives are almost never at risk, so it is tolerated by the community and overlooked by health institutions;

d) there were no records showing the extent of the problem;

e) as a result, there were no surveillance and control standards.

It was not until 1980 that the national government began to study and control tegumentary leishmaniasis, based on the experiences of a local program started in the province of Antioquia. The program confirmed the diagnosis of the disease at the beginning of lesions. Cases were duly recorded and now it is mandatory to report any leishmaniasis case which may appear. The national program provides specific treatment for most reported cases. Werner and Barreto reported 1865 cases of leishmaniasis from all over the country from 1979 to 1989, but only 283 of them had parasitologic verification.

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The information gathered has been collected by some publications, but there was no official or statistical data uniformly collected. A better understanding of the problem has been achieved by analyzing the information gathered as of 1981, when the first steps were taken to start a leishmaniasis study and control program. An analysis of Corredor et al. publication in 1986, helped determine that the annual incidence shows a rate of 3.90 cases in 100,000 inhabitants, which increases to 14.18 in 1990. The information available at the National Ministry of Health shows the amount of Tegumentary Leishmaniasis cases and the disease annual incidence in the country, as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Cases</th>
<th>Rate x 100,000 Inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>1065</td>
<td>3.90</td>
</tr>
<tr>
<td>1982</td>
<td>1266</td>
<td>4.20</td>
</tr>
<tr>
<td>1983</td>
<td>1984</td>
<td>6.91</td>
</tr>
<tr>
<td>1984</td>
<td>2289</td>
<td>8.16</td>
</tr>
<tr>
<td>1985</td>
<td>1353</td>
<td>4.50</td>
</tr>
<tr>
<td>1986</td>
<td>1790</td>
<td>5.88</td>
</tr>
<tr>
<td>1987</td>
<td>2017</td>
<td>6.49</td>
</tr>
<tr>
<td>1988</td>
<td>2721</td>
<td>8.59</td>
</tr>
<tr>
<td>1989</td>
<td>4582</td>
<td>14.18</td>
</tr>
<tr>
<td>1990</td>
<td>3869</td>
<td>11.74</td>
</tr>
</tbody>
</table>

In this publication, the author's estimated rates are based on general population, since the specific population at risk was unknown at that moment. Leishmaniasis rates exceed those of other infectious diseases, such as diphtheria, tetanus, leprosy and brucellosis. Distribution by sex shows that men are more frequently affected than women in a 2 to 1 ratio. This incidence is mainly due to male labour situation and migration. Most cases occur in people over 15 years of age, who form the economically active group.

**Distribution**

Even though the disease is located in specific areas, the infection appears all over the country and coincides with most of the malaria affected areas, which cover 90.2% of the national territory. The disease has been reported in 29 of the 31 provinces in the country. It is centred around the following natural regions:

a) the Pacific coast, formed mainly by rain forests, which represent one of regions with the highest rain fall in the world;

b) the Atlantic coast, predominantly characterized by dry tropical forests;
c) Catatumbo River basin, which extends beyond the border with Venezuela, mostly through rain forests;

d) the Eastern part of the country, which is the third part of the national territory, made up of vast plains covered by dry tropical forests, rain forests, and jungle regions forming part of the Amazon territory that is shared with Venezuela, Brazil, Peru and Ecuador;

e) the Magdelena River valley, which extends from South to North and divides the country in two zones, with dry tropical forests and rain forests.

f) the Cauca River valley, which is also formed by dry tropical forests and rain forest.

All these natural regions are affected by leishmaniasis. The disease appears mainly in low regions that extend through mountains, up to 2,7000 meters above sea level.

The distribution of Leishmania species in Colombia was published by several authors, Saravia et al. in 1985 and Corredor et al. in 1990, and our studies in 1991, which show that the most frequently isolated species is Leishmania panamensis, widely distributed in the country. It corresponds to 53.8% of all the isolate strains, followed by Leishmania braziliensis, found in 30.3% of all the isolate strains. Concerning the Lutzomyia that causes the disease, Lutzomyia trapidoi is the most frequently captured species in the country.

**Visceral Leishmaniasis**

Visceral leishmaniasis in Colombia is restricted to several endemic regions and has less reported cases than tegumentary leishmaniasis. A few cases are reported every year and correspond to some endemic regions. Werner and Barreto's study indicate that up until 1979, only 20 cases of visceral leishmaniasis had been reported. Once the Visceral Leishmaniasis Program was started, more disease affected regions were detected and more cases were reported. The species Leishmania chagasi is considered responsible for the disease in Colombia. Disease affected regions are generally located in rural areas, except for a few peripheral areas of the cities that have rural characteristics. They are located in mountains that do not exceed 800 meters above sea level, have broken topography and form valleys between mountains, covered by dry tropical forests or rain forests. They usually have micro-climate that supports the Lutzomyia longipalpis, a vector, providing natural breeding places, mainly rocks. Occasionally the parasite colonizes artificially in good breeding places near human dwellings, barns, stock yards, animal pens, etc. This maintains animal to animal transmission, since the disease is characteristic in wild foxes and wild and domestic dogs; humans are a mere accident in the transmission chain.
Programs

Only in the last few years has leishmaniasis been given the importance that it really deserves. Cases have been duly recorded since case reporting became mandatory, this has shown the real incidence and extension of the disease. The existence of regions affected by visceral leishmaniasis, as well of their distribution, was also shown. It was found that ATL was highly distributed all over the country and that its predominant form is cutaneous more than mucocutaneous. It also showed that many patients suffer from severe malformation and even mutilation.

Nowadays, there is good motivation concerning the establishment of a leishmaniasis surveillance and control program, including the study of the affected regions. General policies were established to implement the programs in the country to guarantee integral attention for all the leishmaniasis affected patients. By 1987 the Antioquia Regional Health Service had gained a lot of experience in the handling and attention of patients, with well established laboratories and clearly defined technical and administrative standards that have helped the National Ministry of Health extend the programs to the rest of the country. This year, the Ministry of Health is discussing technical and administrative standards for the whole country.

Organization

In order to establish the program, the Antioquia Regional Health Service followed these steps and proceeded to:

a) implement courses to qualify and permanently train the members of the health team;

b) unify and standardize techniques, concerning patient diagnosis and handling;

c) keep the required statistical records in order to determine the extent and characteristics of the problem;

d) detect active and passive cases in order to know the real extent and incidence of the disease;

e) analyze the origin of patients with positive diagnosis, in order to locate affected regions;

f) have a permanent supply of required materials, especially laboratory supplies and specific drugs;

g) develop and promote basic research for a better understanding of the disease, its handling, transmission and control.
The program established in the province of Antioquia measured the real incidence of the disease and served to compare this data to that from previous years. The incidence rate of tegumentary leishmaniasis in Antioquia increased from 3.5 per 100,000 inhabitants to 20.8 in 1990. In 55.8% of the cases it was possible to verify the diagnosis, and 88.9% of the patients detected by the program had cutaneous leishmaniasis.

Control

To control leishmaniasis is not easy, since it is a disease that stays mainly at wild levels, where several animal species are natural carriers, and man is an accident in the transmission chain. Several factors must be taken into account in order to control it. They include: the biology and ecology of carriers; parasite behaviour; vector characteristics; and the local ecology (fauna, flora, soil, meteorologic data, etc). Even the men that inhabit the region must be studied, concerning customs, migration and immunological characteristics.

The control strategies developed within the program established in Antioquia, and those designed by the national government, are centred around a few activities that aim to reduce contact between man and vectors. They are:

a) To develop activities with community participation, in order to provide instruction in prevention measures using educational material;

b) To identify the ecological characteristics of the regions where patients originate;

c) To reduce contact between susceptible people and vectors, promoting net covered beds, screened doors and windows and the use of mosquito repellent and protective clothes;

d) To promote the use of residual action pesticides inside and outside dwellings;

e) To promote adequate disposal of garbage and organic material in order to reduce breeding places;

f) To eliminate infected carriers when detected, such as dogs infected with visceral leishmaniasis;

g) To conduct research in order to obtain new methods of control and efficient application.
Administrative Organization

The program is administered at different levels, which establish a network for the efficient and effective attention of patients. They are:

a) **Minimum level**: At this level the unit diagnoses most of the patients and generally does not have a laboratory. Its functions are to:

- detect affected patients and provide integral attention;
- take samples for direct tests, biopsies and cultures from the tissue and send them to the corresponding laboratories;
- prescribe adequate treatment in accordance with the parameters established by the program;
- refer patients to a more specialized level when diagnosis has not been established or when complications appear;
- support field studies in order to study affected areas;
- promote prevention and control in the community and educate people by means of talks, visits, brochures, etc.
- process statistical data and take care of the efficient handling of laboratory results;

b) **Intermediate level**: It is a health unit that has a laboratory. Its functions are to:

- fulfil the same tasks of the minimum level;
- do direct smear readings, according to the network or laboratory;
- send pre-read preparations for quality control;

c) **Regional level**: It administers a large geographic area and controls several minimum level health units as well as intermediate level units. It has laboratory and several laboratory technicians. Its functions are to:

- fulfil the same tasks of the intermediate level;
- take care of the adequate supply of drugs and materials;
- consolidate, critique and analyze statistical and epidemiologic information, gathered in the region and send it to the Superior level;

d) **Superior level**: It is made up of the offices that coordinate the activities provided by the Regional Health Service Division, specialized laboratories and university hospitals which are in turn coordinated by the Regional Health Service. Its functions are to:

- plan, program, supervise, evaluate and control the activities of the program in the corresponding province;
- serve as frame for all of the aspects related to patient diagnosis, attention and follow up;
prepare reagents and conduct specialized diagnosis tests;
coordinate statistical and epidemiological analysis and critically review all information gathered by the program;
guarantee adequate and timely supply of elements for the appropriate operation of the program;
conduct studies of the affected areas, in respect to parasites, vectors and environment;
send all information gathered by the program to the National Ministry of Health;
conduct studies of the affected areas, with the help of minimum levels and regional hospitals.
develop research projects.

The control measures should be based on long-term epidemiological studies of the foci, improve knowledge of the ecology and increase the effectiveness of research programs.

Leishmaniasis as a Public Health Problem with Emphasis on Latin America

By
Rodrigo Zeledon

Leishmaniasis is a group of important widespread diseases, apparently of ancient origin. They appear to be far more abundant and of greater public health importance than was previously recognized (WHO 1990). Leishmaniasis is not a notifiable disease in many countries and even in those where it is reportable, the actual number of cases is estimated to be three to five times higher than the number reported. The estimated worldwide prevalence of the different clinical forms exceeds 12 million cases, with an incidence of 400,000 new infections per year. The number of persons at risk has been calculated to be 350 million, affecting about 80 countries. Epidemics involving thousands of cases of cutaneous leishmaniasis (CL) have been observed in countries of Africa and serious epidemics of visceral leishmaniasis (VL) have occurred in Asian and African countries, resulting in tens of thousands of deaths (WHO 1991).

New settlements due to population expansion and new developments, such as industrial, agricultural or water resource projects, may bring non-immune persons into endemic areas which result in high numbers of new infections. Even the less aggressive cutaneous forms of the disease can produce serious socio-economic loss in terms of disability of the affected person and costly treatment which sometimes produces undesirable collateral consequences.

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