Onchocerciasis control in Uganda

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In 1990 a community-based programme of onchocerciasis control, involving the use of ivermectin, was introduced in Uganda. The problems confronting it are discussed and suggestions are made for making it sustainable.

Onchocerciasis or river blindness is caused by the filarial worm *Onchocerca volvulus*, which is transmitted between people by the female blackfly (*Simulium*). The threadlike adult worms live coiled in nodules beneath the skin. Some 85.5 million people are at risk of contracting onchocerciasis in Africa, Latin America and the Arabian Peninsula. Globally, about 18 million people are infected; a million are visually impaired and over 350,000 are blind as a consequence of infection. Approximately 95% of the infected people live in Africa.

In Uganda about 1.36 million people are infected and it is estimated that about 1.8 million are at risk of infection. The disease causes severe itching and skin lesions. Affected individuals scratch themselves, often with knives or stones, causing pain and bleeding wounds, these being susceptible to bacterial infection. The itching makes it difficult to concentrate, work and interact socially. Some people with the disease have poor self-esteem and may become ostracized (1).

The principal vectors in Uganda belong to the *Simulium damnosum* and *Simulium neavei* complexes. *S. neavei* is the most important vector, accounting for at least 85% of onchocerciasis transmission in the country (2); it prefers streams of small to medium size which are usually not very fast-flowing and run through forested or heavily wooded areas in highland terrain.

In the 1950s, control was based on the treatment of blackfly breeding habitats with DDT. The method was highly effective but was abandoned in 1973 because of a ban on the use of this insecticide. Two more readily biodegradable products, temephos and *Bacillus thuringiensis*, became available later but were more expensive and Uganda could not afford them. This fact, together with political upheaval, resulted in the collapse of vector control activities.

In 1990, when control activities were resumed, rapid epidemiological assessment by nodule palpation was introduced in districts where vector blackflies had been identified in the 1950s and 1960s, as a means of defining communities in which onchocerciasis was endemic. However, the work was not performed in a systematic manner and it was impossible to arrive at a precise definition of the sizes of foci or their degree of isolation from one another.
**Epidemiological mapping**

A limited number of communities were selected for rapid epidemiological mapping with a bias towards those at highest risk (3). The country was divided into the following zones:

- areas where some rapid epidemiological assessment was performed but not based on the methodology of rapid epidemiological mapping;
- areas where rapid epidemiological mapping was done correctly although some refinement was necessary;
- areas thought to be free of onchocerciasis because of the absence of vector blackflies according to surveys conducted in the 1950s and 1960s.

Nationwide rapid epidemiological mapping confirmed the disease to be endemic only in districts where entomological surveys had identified vector blackflies. Only people living in areas with favourable ecological conditions for the breeding of vector flies were affected. The distribution of the disease indicated the possibility of vector eradication in many foci. Entomological surveys are needed to identify foci where eradication of the vector is feasible by larivicide application, a measure that would complement the distribution of ivermectin and hasten the elimination of onchocerciasis as a public health and socioeconomic problem in many parts of the country.

**Ivermectin distribution**

A multi-country study indicated community-directed treatment with ivermectin to be feasible and effective against onchocerciasis (4), although its sustainability has yet to be proved by operational research. In Uganda, onchocerciasis control through the mass distribution of ivermectin began in 1990, when the National Onchocerciasis Control Programme was launched. A national coordinator of control activities was appointed and several international nongovernmental organizations are collaborating with the Ministry of Health in an effort to eliminate the disease.

Ivermectin is being distributed in 16 of the 17 districts where the disease is endemic. Communities select persons for training on the distribution of the drug, record-keeping, and the management of side-effects. In most instances the distributors’ work is supervised by district onchocerciasis control coordinators and local leaders. Considerable expense is involved in providing fuel and maintenance for the district coordinators. With a view to reducing this cost and providing for increased sustainability when external financial support ceases, health unit personnel should be trained to give medical supervision.

Since 1990 there has been a marked increase in the annual coverage of the target population (see table overleaf). Nevertheless, the following difficulties have been encountered:

- Initially, some communities thought that ivermectin was intended to reduce their fertility and thus to diminish
### Numbers of people treated with ivermectin and percent coverage in selected districts of Uganda during 1991, 1994 and 1996

<table>
<thead>
<tr>
<th>District</th>
<th>1991 (no. treated)</th>
<th>Coverage (%)</th>
<th>1994 (no. treated)</th>
<th>Coverage (%)</th>
<th>1996 (no. treated)</th>
<th>Coverage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabale</td>
<td>14,100</td>
<td></td>
<td>10,664</td>
<td>75.6</td>
<td>11,364</td>
<td>80.6</td>
</tr>
<tr>
<td>Moyo</td>
<td>267,000</td>
<td></td>
<td>194,052</td>
<td>72.7</td>
<td>238,479</td>
<td>89.3</td>
</tr>
<tr>
<td>Hoima</td>
<td>53,635</td>
<td></td>
<td>49,274</td>
<td>91.9</td>
<td>48,674</td>
<td>90.6</td>
</tr>
<tr>
<td>Kabarole</td>
<td>59,256</td>
<td>35,215</td>
<td>47,904</td>
<td>80.8</td>
<td>37,589</td>
<td>63.1</td>
</tr>
</tbody>
</table>

Population growth. Some people imagined that the drug was meant to kill people with HIV/AIDS, while others thought it was directed against tax defaulters. These notions, which have been corrected through extensive health education, were partly responsible for the low coverage achieved during the first few years.

- Some district authorities had only limited knowledge of the disease, despite the fact that it was well understood by the affected communities. A considerable effort involving workshops, the mass media and monthly newsletters helped to remedy this situation.

- Ivermectin is provided free of charge by the manufacturer, but the cost of delivering it from the point of entry into the country to the communities is very high and unsustainable. External support currently allows the drug to be delivered to the districts. In order to attain sustainability, budgetary provision should be made for the drug to be taken from Entebbe Airport to the districts, while delivery to the communities should be incorporated into the arrangements for moving essential drugs. Pilot schemes based on these suggestions could be organized in some districts.

- In some areas where ivermectin distribution is in progress there are programmes giving incentives to community-based workers. This has caused a high drop-out rate among community-based distributors of ivermectin who do not understand why the Onchocerciasis Control Programme gives them no remuneration. In an attempt to overcome this constraint, large numbers of people have been trained so as to maintain an adequate pool of competent distributors. There is also a need to intensify health education in the communities in order to create a demand for annual ivermectin treatment. This would encourage the communities to look for ways of supporting the distributors and the ivermectin distribution activities in general.

- Impassable roads and other adverse infrastructural conditions in many parts of the districts where the disease is endemic make implementation difficult. However, this constraint can be overcome by making the programme community-based. If the work of the distributors could be supervised by
health unit personnel residing in the communities, travel in four-wheel-drive cars could be reduced.

- More than 400,000 Sudanese refugees, who are likely to be carrying a blinding strain of the parasite acquired in their home country, have settled in areas where active transmission occurs. Mass distribution of ivermectin is being organized in their camps. Vector blackflies do not, of course, respect national boundaries, and political stability in neighbouring countries where the disease is endemic would help onchocerciasis control activities to proceed.

- There is cross-border infection from the Democratic Republic of the Congo, where ivermectin distribution does not take place. When the drug is being distributed in Ugandan communities, people cross the border to obtain treatment. Together with the treatment of refugees, this sometimes makes it difficult to estimate the quantity of ivermectin tablets required annually for the Ugandan programme.

A promising approach to sustainability in the delivery of ivermectin is evident where strongly committed communities participate in the process. However, the communities need technical support from their district health services, with which community-based ivermectin delivery should therefore be integrated. Health education and community mobilization should be intensified in order to create an attitude of programme ownership and a demand for annual ivermectin treatment among communities. Ivermectin delivery in communities where onchocerciasis is endemic has been largely dependent on external financial resources. The Ministry of Health and the districts should start making a budgetary provision for contributing to the distribution of the drug.

References