

# Determination and Control of Schistosomiasis

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*The subject of this conference reflects the scientific community's interest in seeking to understand the complex causal web whose various social, economic, and biological components interact in the production and reproduction of schistosomiasis and its control in relation to community participation.*

*From the onset, the author stresses the impossibility of dealing separately with community participation, as if social components were just one more "weapon" in the arsenal for schistosomiasis control.*

*This study begins with a brief historical review of the 71 years of control activities with this endemic disease, stressing the enormous efforts and huge expenditures in this field vis-à-vis the limited results, despite the extraordinary technological development of specific, classical control inputs such as new treatment drugs and molluscicides.*

*The article then discusses the various strategies used in control programs, emphasizing ideological consistencies and contradictions. Interactions at the macro and micro levels are discussed, as are the determinants and risk factors involved in producing the disease's endemicity.*

*Unequal occupation of space leaves the segregated portion of the population exposed to extremely favorable conditions for transmission of the disease. This raises the issue of how to control an endemic disease which is so closely linked to the way of life imposed on the population. The study challenges the classical control model and suggests an alternative model now undergoing medium-term investigation in the States of Espírito Santo, and Pernambuco, Brazil.*

*The author concludes that we do not need new strategies, but a new control model, contrary to the prevailing classical model in both concept and practice. From the conceptual point of view, the new model mentioned above is different from others in that schistosomiasis control is seen from a social perspective stressing the population's accumulated knowledge in addition to the building of shared knowledge. The model's praxis has the following characteristics: (1) it is integrated with and financed by research agencies and health services; (2) it operates at the local health services level; (3) use of molluscicides has been eliminated; (4) emphasis is given to individual medical treatment and improvement of sanitary conditions.*

Key words: schistosomiasis control - alternative model for control - Brazil

The topic I was asked to expound on at this conference reflects the scientific community's interest in seeking to understand both the complex, intriguing causal web and community participation in schistosomiasis control. This is a particularly difficult task leading inevitably to theoretical and methodological questions which the limited space of this conference does not permit me to analyze in depth. I would stress, however, that such elements cannot be dealt with separately, as if social components were just one more "weapon" - often referred to as an "auxiliary tool" - in controlling the endemic disease. I will attempt to approach the topic as concisely as possible and relate the conceptual discussion to praxis in schistosomiasis control, referring more specifically to schistosomiasis mansoni.

Schistosomiasis control began in Egypt in 1922, when that country's government set up specialized

clinics for treating people that were infected by the parasite (Mousa & Ayad 1972).

Based on an old biological postulate that the intermediate host was the weakest link in the life cycle of parasites, the struggle began against the mollusk transmitters of schistosomiasis in Egypt in the 1940s, with the use of copper sulfate, replaced by sodium pentachlorophenate in 1955.

The medical and biological literature (WHO 1992) is full of studies on the use, application strategies, and development of new molluscicides. Two such products, niclosamide (Bayluscide) and N-tritylmorpholine (Frescon), received the most attention from researchers and public health officials and were recommended and utilized for several years in large-scale campaigns in some endemic countries.

Field studies carried out in Egypt and published in the *WHO Bulletin* (Farooq & Hairston 1966) -

pointing to the efficacy of Bayluscide in schistosomiasis control - appeared to scientifically consolidate the decisive role of molluscicides in controlling the disease.

The above studies were challenged by Giles and collaborators (1973). A long-term field study in northeastern Brazil (Barbosa & Costa 1981) showed the limitations of the use of this molluscicide in controlling the disease. Despite publication of these two studies (rarely quoted in the scientific literature), molluscicides have continued to be used eagerly by endemic countries.

Meanwhile, treatment drugs evolved to the point of large-scale production and utilization of Oxamniquine and Praziquantel, now competing with each other on the international market. The former (used more frequently in Brazil) proved to be quite well tolerated, with a high cure rate, easy to use, and at a modest cost. Millions of doses of this drug were administered in Brazil during the Special Schistosomiasis Control Program (PECE).

With two chemical "weapons" at their disposal, Third World countries began to use these two drugs simultaneously to control the disease.

National schistosomiasis control programs have emerged in several regions of the world. The PECE in Brazil is an example of a so-called integrated, broad-based program. However, the program has never been submitted to a thorough, overall assessment.

There appears to be consensus about the impact of specific treatment in reducing the prevalence of hepatosplenic forms of the disease. However, it has not been possible to reduce prevalence below a given level or to keep it low (Katz 1982, Kloetzel & Schuster 1987).

All of the literature over the last 71 years leads to one inevitable conclusion: that in spite of technological progress in producing molluscicides and parasiticides and some favorable partial results, eradication of this disease has only occurred in one country, Japan.

In the face of evidence that schistosomiasis will not be defeated through the exclusive use of drugs and pesticides, the scientific community has sought new approaches in recent years to justify the intensive use of its traditional technological "weapons".

A series of conceptually conflicting proposals have thus been raised which are known as "new control strategies". Control programs have come to be called "integrated", seeking to incorporate basic sanitation works, educational activities, community participation, and integration with local health services.

As might be expected, such new control strategies are backed by the apparent logic of neoliberal

political and social movements, which are hegemonic in the First World. Consequently, such proposals appear with an extremely conservative ideological content, stressing the role of individuals themselves as responsible for their own disease.

Reduction of the hepatosplenic forms of the disease through the use of specific drugs, a possibility demonstrated in the 1960s (Kloetzel 1967), led to the development of one further control strategy proposed in a WHO document (WHO 1985), namely, the reduction or elimination of more serious clinical forms. This opinion was seconded by several countries around the world and was adopted by Brazil in the Special Schistosomiasis Control Program, which went so far as to change its objectives to accommodate it.

WHO expert opinions have a marked influence on the thinking of researchers and administrators in the health sector. Still, one conclusion of the second meeting of WHO experts on schistosomiasis control (WHO 1993) was that reduction of serious forms of the disease is only one of the strategic objectives for controlling the disease. This tended to counteract the overblown optimism created by the opinions of various professionals, who contended that schistosomiasis was destined to become a minor public health problem.

Although the morbidity of schistosomiasis has been reduced, the endemic is still a major public health problem. WHO admits that there are tens of millions of individuals worldwide with severe chronic lesions produced by schistosomes (WHO 1993). Schistosomiasis has its own epidemiological characteristics, and the disease is spreading in Brazil and other countries. Hepatosplenic forms of the disease are still frequent in northeastern Brazil.

All of the arguments above point to the difficulties in controlling an endemic disease through the use of models and strategies that are inadequate for the respective realities faced by endemic countries.

This raises the challenge of how to control schistosomiasis in the world's tropical belt where, by no coincidence, underdevelopment coexists with the endemics produced and maintained by the marginalization of major portions of the population. What, then, are the determinants of schistosomiasis?

Of course, everyone will agree with the obvious concept that a country's or region's epidemiological profile depends on its socio-economic structures and political decision-making processes. However, such relations are not linear; rather, they depend on a complex web of factors that are present not only in the underdeveloped world. Terris (1993)

recently referred to the regressive phenomenon occurring in the United States with the resurgence of cholera, an increase in sexually transmissible diseases, and the return of tuberculosis in that country. The problem is thus universal.

The focal distribution of schistosomiasis has been known for years. Control strategies were described which sought to act at the micro level (Kloetzel et al. 1990).

"The shift toward a micro-level approach to schistosomiasis control puts more emphasis on the importance of small groups of persons, families and individual risk behaviors, thus calling for the need of creating more culturally sensitive strategies for control. By looking at people's perceptions about health and disease one can retrieve important information about health-related attitudes and behaviors relevant to schistosomiasis transmission and control. This constitutes key information to ensure the planning of a sustained schistosomiasis control program in which community participation can be fully attained". (Barbosa & Coimbra 1992).

Schistosomiasis is one of the so-called "tropical" endemic diseases which displays the closest relationship to the population's way of life. Although this relationship has been known for some time, it has been dealt with conceptually according to the classical behaviorist view in the sense of blaming individuals for letting themselves get infected through their own behavior. This has led to the term "man-made disease" and the acceptance of statements like, "schistosomiasis is caused by persons themselves" (Mott 1984). This expression was later changed to "person-made disease" (McCullough 1992). The victim thus becomes the villain.

There are two levels of analysis for approaching this issue, the macro and the micro. The former explains the health/disease process through the broader elements of historical, economic, and political analysis. The latter is concerned with the microenvironment and results from the unequal distribution of the space where man lives and works (Barbosa 1984).

People do not live in unhealthy places because they want to. Their lives are historically determined by the macro-social factors mentioned above. While determinants are hierarchically ordered, the mediations between the macro and micro levels need to be better understood.

In an environment where the risks of becoming sick and dying are significantly increased, cultural factors interact with bioecological ones, constituting an extremely favorable biocultural complex for the transmission and maintenance of endemic diseases, produced and reproduced through this process.

Community mobilization and participation and health education have been used as equivalent terms and considered instruments to be appended to the technological arsenal for combatting endemic diseases. Basic sanitation has been less emphasized.

Basic sanitation works in rural or peripheral urban areas are not generally included in schistosomiasis control programs for the simple reason that they have never been able to compete politically with the chemical inputs produced by large industry. Sanitation is generally considered too expensive to be used in Third World countries, even though these countries have been spending huge sums of money on classical control measures for the last 71 years.

Sanitation, as part of a community's development process, is a decisive factor for controlling endemics with an oral/fecal cycle, including schistosomiasis. Sanitation is a permanent public work to which all should be entitled access, in addition to being an important element in environmental control.

Fundamental studies published over the last decades (Pitchford 1958, 1972, Barbosa et al. 1971, Jordan et al. 1975) have received little attention in the current scientific literature.

A recent publication coordinated by De Wolfe Miller (1990) refers to the studies mentioned above, stressing particularly the role of the domestic running water supply: "There is a reproducible scientific observation that improvements in water supply have reduced and will continue to reduce *Schistosoma haematobium* and *S. mansoni* occurrence".

In general, the results obtained in schistosomiasis control have been limited. Meanwhile, incalculable sums of money have been spent on both limited projects and extensive national programs. If cost/benefit results could be calculated for such operations, they would be far short of satisfactory.

Southgate (1992) has pointed to two schools of thought: those who believe that the disease is an individual problem and those who feel that the true weight of schistosomiasis in public health can only be assessed in terms of its total effects on communities. Although Southgate (1992) is aware of the problem's dimensions, he attempts to maintain a kind of neutrality (which in fact is non-existent) in that he fails to consider macrosocial determinants and their relationships to the way of life of marginalized populations.

We need to take an objective stance towards schistosomiasis control, since the classical model with its various strategies has still not solved the problem.

In reality, we do not need new strategies, but a new model in opposition to the prevailing, classical one both in concept and praxis - a model that can be tested in the field. Any new model seeks a synthesis that coexists with the old in some way. The change is to achieve paradigms that replace inadequate philosophical and political concepts. Such a schistosomiasis control project is now entering its second year of operation in the county of Afonso Cláudio, Espírito Santo, Brazil (Barbosa et al. 1993). From a conceptual point of view, the model being constructed there is opposed to the classical model in use in Brazil. Under this new model, schistosomiasis control is seen from a social perspective giving priority to the local population's accumulated knowledge and the building of collective knowledge. It is a controlled intervention study involving the community as a whole, integrated with the local health system. The use of molluscicides has been eliminated and emphasis placed on individual medical treatment and improvements in basic sanitation. The project is being financed by the Oswaldo Cruz Foundation, the National Health Foundation, the Espírito Santo State Health Department, and the County Health Department. A similar control program is being developed in the State of Pernambuco, Brazil.

The predominantly technocratic view towards control of endemic diseases based on the intensive and extensive application of pesticides and parasiticides should be replaced by another paradigm, of a socio-cultural order. The notion of knowledge of the disease should be rerouted towards an understanding of the production of its endemicity in all its scope, as described in this article.

Once again I quote Southgate (1992) as he expounds his idealism: "Attitudes and approaches to schistosomiasis control are thus in a state of very rapid change and evolution, and the next few years promise to be very exciting, as a combination of research and increasing experience allows us to plan and implement strategies in cooperation with the affected communities themselves."

Unfortunately, things are not quite that simple. Relationships with a community can only be understood when they include "as their main thrusts the right to citizenship and the building of knowledge, where the conjunction of technical knowledge with the population's life experience allows [one and all] to visualize another panorama of the situation, previously unrevealed". (Valla et al. 1993)

Conclusions: (1) schistosomiasis are serious diseases that are spreading in some areas of the world; (2) schistosomiasis control has not produced the expected results, despite technological progress in the production of molluscicides and parasiticides; (3) schistosomiasis has only been eradicated

in one country, Japan; (4) the technological model and its various strategies, developed in First World countries, are not applicable in Third World countries because they are based on conservative ideologies blaming individual humans for producing their own disease; (5) schistosomiasis control and that of other endemics must be viewed from an opposite perspective. A new control model must be developed on the basis of a socio-cultural paradigm that is capable of explaining the overall process of producing the disease's endemicity.

Based on the above concepts, it should be possible to begin rational programs for the control of endemics, as long as the new model is built and validated through intervention studies in the field.

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