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Letter to the Editors

Reflections on a Schistosomiasis Conference and on Control

Adequate control remains the major problem in schistosomiasis. Many control projects were commenced and innumerable conferences have been held during the past 2 decades but the prevalence of schistosomiasis continues to increase in many countries.

Two reasons for this are, firstly, that although lip service has been given to the effect of human behaviour on control measures, the central importance of such behaviour has not been recognised. Secondly the failure to appreciate that like many other parasitic conditions, schistosomiasis clearly demonstrates the phenomenon of marked biological variation. These variations may include biochemical differences in the parasite, different immunopathological reactions in the human host, widely diverse transmission patterns, different behavioural patterns of snails, variation in the intensity of infections both in intermediate and human hosts or different responses to chemotherapy between different communities and in different individuals of the same community.

An international conference on schistosomiasis was held in Cairo (October 18–25, 1975). It was organized by the Ministry of Health of Egypt in association with the United States Department of Health, the United Nations Environment Programme and the World Health Organization.

There are many reasons why Cairo was a satisfactory venue for this conference. Schistosomiasis is known to have existed in Egypt 3000 to 4000 years ago. Blood in the urine is described in papyri fragments written about 1900 B.C. Calcified ova of *Schistosoma haematobium* have been demonstrated in mummies of the Twentieth Dynasty (1250–1000 B.C.). Since Theodor Bilharz, working in Egypt, in 1851 found the causative agent of urinary schistosomiasis in the mesenteric vessels of a cadaver, many scientists both Egyptian and others have worked on bilharzial projects in Egypt.

Although addresses at the opening plenary session tended to be formal with marked political overtones there was one exception. This was the address by the Director General of WHO. While accepting the necessity for a multipronged attack (chemotherapy, improved sanitation, education and a variety of anti-snail measures) against the parasite Dr. Mahler attempted to place human behaviour in the foreground as a central issue in control schemes. "Have we really considered all aspects of human behaviour in their holistic setting?" He also implied that intelligent application of both conventional and non conventional known methods would be more fruitful than spending large sums of money on new technical achievements.

Listening to the recommendations of the different working groups at the end of the conference it appeared that the remarks of Dr. Mahler had had little impact. The purpose of this article is to consider the implications of Dr. Mahler's concepts as applied to schistosomiasis research and control and to emphasize the importance of epidemiological variation.

A control programme aims at the reduction of the prevalence of schistosomiasis to a level where it is no longer a major public health problem whereas eradication aims at ending transmission and eliminating the reservoir of infection in the definitive host or hosts.

Most attempts to control schistosomiasis aim at:

- (1) reducing the intermediate hosts or
- (2) preventing eggs from reaching water.

There are numerous approaches towards these objectives. Not only may epidemiological situations vary greatly between different regions but localities within the same area may have different patterns of transmission. For example, in a village in the Tanga region of Tanzania, where drinking and washing water is obtained from non polluted wells, focal transmission is occurring in a dam constructed for watering cattle. Children play and swim in this dam and thus, in this village, there is a high prevalence of schistosomiasis among children and a low prevalence among adults. But in a village a short distance away transmission is occurring in rice fields and in a small stream. In this village there is more even prevalence in all age groups and both sexes are affected. In other situations transmission may be confined to irrigation streams, temporary ponds, rivers or inland lakes.

Control methods are largely determined by the local epidemiological situation. When man-water contact tends to be for prolonged periods in a large water body used to produce a basic food crop e.g. rice fields, then reduction of transmission may take a long time. In this situation superimposed technological solutions are unlikely to succeed, for in the case of molluscicides, not only is there the formidable problem of the technical feasibility of dispersing a chemical over a wide shallow stagnant water body but the known biocidal effects of several molluscicides precludes their use.

In this situation where efficient mollusciciding is not possible lowering of transmission may of necessity be slow and means of control are limited to public health measures and education aimed at reducing pollution and regular parasitological examinations with subsequent treatment of infected cases.

On the other hand where transmission is confined to channelled irrigation schemes, a well planned and efficiently executed campaign involving mass chemotherapy to the population responsible for polluting the channels, mollusciciding at regular intervals and reducing man water contact to a minimum may break transmission with subsequent eradication in less than a year. But the effectiveness of this centrally organised, hierarchical, linear approach in which the end result is rapidly reached only applies in certain situations.

It is the failure to work out the complex logistics involved in the variable ecological situations that has marred many control programmes. Within these varied circumstances there is a temptation for scientists and Ministries of Health to think only in terms of large scale, central overall solutions, whereas in most rural communities with variable socio-economic and cultural structure a small scale, grass root, holistic approach is more likely to succeed. But this requires much more detailed specific analysis of each separate situation and because of the necessity for community participation in this control approach the requirements are more demanding. It is at this point that Dr. Mahler's concept of looking at man in his total environment takes on significance. Of the persons likely to be involved in schistosomiasis control – scientists, administrators and politicians, rural health personnel and the local population at risk, it is the latter group which is the basic functional unit of local small scale control projects for without their willingness to actively participate grass root campaigns will not succeed.

To summarize the local epidemiological situation will determine whether control methods are based on an army linear type chain of command or whether attempts are made to co-ordinate different units having different areas of responsibility (modification of snail habitats, constructing safe water supplies,

mass administration of drugs, education) or whether a combination of this linear and non linear approach is warranted in the one project.

A wide spectrum of scientists present at the conference deliberated on the papers presented. There were the anti-pollutionists including those on the band waggon, the diplomats who smooth over and the “publish or perish breed” were well represented. There was also a sprinkling of pontificators, moralists and academics – empire builders completely out of touch with field situations. Mutterings were also heard from a few diehard cynics who had been on the conference circuit for years and had seen the rise and fall of many anti-parasitic control programmes.

Numerous recommendations were made by the subcommittees. These included the need for further studies on epidemiology, immunology, immunopathology, snail biology and cost benefit effectiveness of programmes. Such recommendations have been made *ad nauseum* and are likely to continue being made at schistosomiasis conferences for the foreseeable future.

One subcommittee noted that “human behaviour should receive appropriate attention in any long term measures for control of transmission”. To see the human in his total environment does not mean to take note of cultural and sociological factors as they impinge on a preconceived control scheme but to make communal participation the central pivot through which the technology of control is channelled and by which it is implemented. Unless this dynamic concept of Dr. Mahler’s is grasped and actualised it seems likely that the prevalence of schistosomiasis in many parts of the world will continue to increase.

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