

Control of Schistosomiasis Transmission

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Despite the success of control programmes, schistosomiasis is still a serious public health problem in the world. More than 70 countries where 200 million individuals are evaluated to be infected of a total 600 million at risk. Though there have been important local success in the control of transmission, globally the infection has increased. Economic constraints in developing countries, environmental changes associated with migration and water resources development have been blocking the progress. The main objective of schistosomiasis control is to achieve reduction of disease due to schistosomiasis. We discussed the control measures like: health education, diagnosis and chemotherapy, safe water supplies, sanitation and snail control. We emphasized the need to give priority to school-age children and the importance of integrating the measures of control into locally available systems of health care. The control of schistosomiasis is directly related to the capacity of the preventive health services of an endemic country. The strategy of control requires long-term commitment from the international to the local level.

Key words: schistosomiasis - control - transmission

Transmission of infection needs contact with water harbouring snail intermediate hosts in an area where sanitation is at a low level and there are infected individuals.

Basically, control of transmission involves measures like: reducing the risk of exposure to infected water and reducing the level of environmental contamination with schistosome eggs, and water contamination (Jordan & Webbe 1982).

The strategy for control of morbidity is effective (WHO 1993). The measures of control are health education, chemotherapy, water supply and sanitation, and snail control. The optimal balance between these measures will differ from one country to another.

Chemotherapy plays an important role in any control programme and will reduce morbidity in the short term. Schistosomiasis transmission will depend on treatment can be applied and the epidemiological conditions.

The primary health care level is a prerequisite for achieving sustainable control.

According to WHO (1993) six factors should be observed when developing schistosomiasis control strategies: the felt needs of the population; the specie of *Schistosoma* present; the prevalence and intensity of infection, and the prevalence and se-

verity of morbidity; epidemiological, ecological and environmental characteristics; the facilities of primary health care; technical support and the capacity for central and district management; the general coordination.

Control of schistosomiasis is not a static concept. The objective of control in the past has been considered as the interruption of transmission. Actually, the principal objective of schistosomiasis control is to achieve reduction of disease due to schistosomiasis.

The current trend is to integrate schistosomiasis control activities into the general health delivery system. There are many endemic areas where schistosomiasis is not yet recognized as an important public health problem and where it receives only a low priority for control.

The schistosomiasis control is feasible. The question is how it will be implemented within the available human and economical resources of the endemic country. The control is related to the capacity of the preventive health services of an endemic area.

BASIS OF CONTROL

Epidemiology - Epidemiological characteristics must be considered in the assessment of a country's ability to undertake control. The characteristics have been defined by population based on epidemiological studies (Wilkins 1987); focal transmission is the role within an endemic area (Marçal

Jr et al. 1991); only a small proportion of infected individuals have severe infections; the intensity of infection and prevalence are different from one locality to another; the prevalence and mean intensity of infection increase in parallel; the highest prevalence and intensity of infection are found in persons between 10 and 19 years old; water contact pattern; the presence of the disease in children or as sequelae in adults are directly proportional to the intensity of infection (Dias et al. 1992b).

Health education - Health education remains a high priority in control programmes (WHO 1985, Teesdale 1986). Community participation is vital in schistosomiasis programme (Ravaoalimalala 1986, Tanner et al. 1986). A health education approach can be developed in all endemic areas, emphasizing personal hygiene and the individual's role in controlling schistosomiasis. All control programmes require the knowledge, attitudes and practices of a community (Marçal Jr et al. 1993). Health education materials in local languages have been prepared for most programmes.

Snail control - Control of snail intermediate host is an effective means of reducing transmission of schistosomiasis, and may entail the use of molluscicides, plant molluscicides, biological agents and environmental management. The efficacy of snail control can be enhanced if combined with other methods of control. Chemical control remains the best method for the destruction of snail hosts. The focal use of molluscicides at epidemiologically important water contact sites has reduced the costs of snail control.

Diagnostic techniques - Parasitological, immunological (Dias et al. 1992a) and indirect techniques are available for diagnosis of schistosomiasis. The selection of any particular diagnostic technique in a large-scale programme is based on a series of choices. Quantitative diagnostic techniques have a unique role in the evaluation of schistosomiasis control. Diagnosis for public health purposes requires that the technique is robust and simple using supplies and equipment that are readily available (WHO 1993). Development of diagnostic capacity is a goal of many health services and will contribute to overall efforts to control schistosomiasis.

Chemotherapy - According to Davis (1986) chemotherapy plays a leading role in the control of schistosomiasis, as in all other helminthic diseases. The primary objective of chemotherapy in schistosomiasis control should be the reduction and prevention of morbidity. Reduction of morbidity after treatment has now been validated with metrofonate, oxamniquine and praziquantel. Periodic treatment is now established as a central

component of control. The appropriate drug treatment lowers worm burdens and prevents or reverses disease caused by all schistosome species. Several useful approaches are used for community-based treatment have been developed as: mass treatment, selective population chemotherapy and selected group treatment. Actually resistance and/or tolerance to antischistosomal drugs in current use are emergent problems that need special attention (Dias & Gonçalves 1992, Drescher et al. 1993). In Brazil and Kenya were reported drug resistance and tolerance to oxamniquine and praziquantel.

Environmental management - Modifications through drainage, water management practices may be an effective means of eliminating the snail hosts of schistosomiasis. In irrigation development selection of the technique (i. e. surface or overhead drip) is the first decision with important health consequences. The siting of human settlements in and irrigation regions should be controlled (Brinkmann & Steingruber 1986, Mott 1987, WHO 1993).

Water supply and sanitation - The schistosomiasis in many parts of the world is directly related to human contact with water. The most transmission of schistomiasis occurs during water contact for domestic and recreational purposes, and some water contact is occupational (Marçal Jr et al. 1991).

Water supply is central to the control. However a safe water supply by itself may not be sufficient to reduce schistosomiasis transmission and epidemiological data are also necessary (Marçal Jr et al. 1993).

It was conclude that a 10-20% reduction in the number of people with schistosomiasis (18-36 million cases) might be achieved as a result of providing safe public water supplies (De Wolfe Miller 1990).

However improvement of the water supply continues to be neglected as a measure for the control.

The construction and use of latrines should be encouraged to improve the standard of hygiene and to reduce the incidence of other faecal-borne disease as well (McJunkin 1983, Werler 1986).

Data management - The management of data aims to identify operational priorities and to target control activities on an epidemiological basis. In most control programmes some indices are needed, especially those related to the reduction of morbidity due to schistosomiasis in treated populations (Dixon 1986). The most indices are based on egg counts: prevalence of infection, prevalence of heavy infection, intensity of infection and incidence (Mott 1987). Microcomputers are taking their place in database management at central level and peripheral levels.

Training, organization and management - The training activities must be repeated periodically to update staff on new advances in technology and to rationalize the operational measures.

The organization and management of schistosomiasis control must be improved according to assure the efficacy of operations. It is an important sign of progress in national control programmes.

Cost of control - The cost of control remains high. Behind the costs there are a number of complex administrative and logistical issues which sole to every endemic country. The diminishing per capita expenditure on health in developing countries should be of concern to the international community.

Assessment of control - As human and economical resources in endemic countries become more restricted, assessment will become important. Changes from the initial prevalence and intensity of infection can evaluate the control operations. Evaluation technique based on limited sampling procedures may not represent the true situations. The university-based research groups and governmental agencies can be mutually evaluate the operational methodology as well as the impact of control.

Quality control, especially in the laboratory, is an important aspect of control.

Advances in general and biomedical technology have been proved to contribute effectively to schistosomiasis control. For example, microcomputers, ultrasound technology and health education through use of videotapes and television can reach endemic areas.

Though there have been important local success in the control of schistosomiasis (for example, in China, Brazil and Pemba Island, Tanzania), globally the infection has increased during the last decade (WHO 1993). This has been due partly to irrigation projects and partly to migration. Recent years have been a shift away from transmission control to the control of severe morbidity. This shift was facilitated by the praziquantel, a safe and highly effective drug against all human schistosomiasis species.

The distribution of schistosomiasis is constantly changing. The migration of rural populations into urban areas continues unrelentingly. Today the schistosomiasis is as an important public health problem in large cities of endemic countries (WHO 1985).

There is a evident need for greater commitment to schistosomiasis control. However this may only be achieved by long-term efforts when the public health and socio-economic importance of the disease is better understood.

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