New initiatives in the control of helminths

D. A. P. Bundy  Wellcome Trust Research Centre for Parasitic Infections, Imperial College of Science, Technology and Medicine, Prince Consort Road, London, SW7 2BB, UK

Over the last decade, intestinal nematode infection has become increasingly recognized to be an important and soluble public health problem. The availability of benzimidazole anthelmintics has been a major contributor to this perception, not only because they have made single dose cure a reality but also because the broad spectrum of activity allows infection with *Ascaris, Trichuris*, the hookworms and other common nematodes to be tackled as a single disease entity. From this perspective, the disease caused by the 1000 million infections due to multiple geohelminth species is difficult to ignore. On this scale of infection even mortality, which is acknowledged to be a very rare consequence of helminth infection, assumes substantial proportions: current estimates suggest that more than 150 000 avoidable deaths occur each year due to geohelminthiasis, which bears comparison with global mortality due to diseases more traditionally viewed as lethal (e.g., African sleeping sickness is estimated to have an annual death toll of less than 4000). The large burden of geohelminthiasis has even more profound public health consequences in terms of morbidity. Careful clinical and epidemiological studies have demonstrated that chronic infection with the major geohelminths persists, and is most intense, throughout the vulnerable years of childhood, with insidious effects on growth and development. More importantly, they have demonstrated that these effects are largely reversible by simple therapy. The traditional argument, that therapy is irrelevant to the control of helminth disease because children become reinfected, is difficult to sustain in the face of the remarkable catch-up growth achieved by some children after a single treatment.

Much of the reassessment of the public health importance of these infections was stimulated by the World Health Organization (WHO) reactivating, in 1980, a programme for the control of intestinal parasites (WHO, 1981). Despite considerable efforts, however, the translation of policy into action has been slow to occur. The difficulty is one of scale: the exceptional prevalence of geohelminthiasis, which justifies intervention, also presents exceptional logistic difficulties for the design of control programmes. While the cost of individual treatment is low, the total cost of treating such large numbers of infections becomes substantial, and has to compete for scarce resources in the endemic countries. The recent initiatives for control have addressed this problem, not by elevating the priority of geohelminth infection—which is difficult to justify in the presence of continuing morbidity due to malnutrition, diarrhoea and vaccine-preventable diseases—but by setting the control of helminths within the wider context of development, and by perceiving parasite control as a component of an integrated package of health interventions.

Situating disease, including parasitic disease, control within a broader health context was one of the aims of a recent review of health sector priorities undertaken by the World Bank. One important conclusion was that school-based chemotherapy for intestinal helminths compared favourably in cost-effectiveness terms with diphtheria-pertussis-tetanus/polio immunization and oral rehydration therapy for diarrhoeal disease, relative to conservative assumptions of morbidity (days of healthy life lost). The advantages, in terms of the dynamics of transmission, of targeting treatment at school-age children are well established (Anderson & Medley, 1985). The World Bank review's chapter on helminthic infections also concluded that large scale mass treatment, perhaps involving more than one therapeutic agent, could represent an important and cost-effective interim health strategy in those many parts of the world where improved sanitation is not presently feasible, particularly if conducted in concert with other community-based programmes (Warren et al., 1990). The linkage between malnutrition and worm infection offers one potential area for such a combined approach. The subcommittee on nutrition of the administrative committee on coordination (ACC/SCN) of the United Nations (UN), which harmonizes policy throughout the UN system, has recently reassessed the interaction between malnutrition and infection (Tomkins & Watson, 1989). The subcommittee's conclusion that 'treatment of intestinal parasites may often be a desirable accompaniment to food supplementation programmes' has far-reaching implications, not least in respect of the global activities of the World Food Programme. The technical recommendation of the WHO is that where the prevalence of mild–moderate underweight in children is greater than 25%, and where parasites are widespread (criteria which apply to many of the less developed regions of the world), high priority should be given to de-worming programmes for the treatment of parasites because of the potentiating effects on food supplementation programmes.

In addition to linking intestinal helminth control with nutritional programmes, the WHO is developing programmes which incorporate geohelminth control in programmes for the control of other important parasitic infections. Such programmes are an extension of existing activities in parasite control (WHO, 1987). The rationale is that since the cost of delivering
treatment represents 75–90% of total programme costs, there will be a substantial increase in effectiveness and only a marginal increase in cost if the same system is used to deliver multiple therapies. One initiative being developed by the Divisions of Tropical Disease Research and Control (TDR/CTD) is to modify programmes currently delivering praziquantel for schistosomiasis control to deliver in addition therapy for geohelminthiasis. The WHO Communicable Disease Division is currently examining other options for instigating geohelminth control.

The UNICEF child survival and development revolution and the WHO expanded programme on immunization have made remarkable progress in reducing the avoidable mortality of children under the age of 5 years. Much remains to be done, but with an estimated 5000 child deaths avoided daily, attention is now turning to methods for promoting the quality of life of the children who have been saved. In addressing these post-survival issues, the UNICEF International Child Development Centre has implemented programmes to promote national capacity building in African countries (LEMM&A VALKÖNEN, 1989). The control of geohelminth infection has a dual role in such programmes. Firstly, it provides a focus for the health activities of the community, government agencies and national institutions. The control of worm infection is a perceived need of most endemic communities and is a recognized point-of-entry for community health programmes. The Japanese Organization for International Co-operation in Family Planning (JOICFP), for example, has demonstrated in co-operative programmes involving more than 19 countries that parasite control can be used as a means of promoting health education in general. The second relevance of parasite control to programmes focusing on child development is the particular importance of worm infection for children: the most serious consequences of geohelmintus arise from chronic infection during the vulnerable years of childhood. It has been argued, in the context of the rights of the child, that there is a particular imperative to foster the development of children who have survived the onslaught of acute disease in infancy.

The theme of child development is also taken up in a recent statement by the Director of the United Nations Educational, Scientific and Cultural Organization (UNESCO): 'the struggle to save children's lives must go hand in hand with an effort to change the lives thus saved'. The UNESCO international project to improve primary school performance, nutrition and health is a recent contributor to this effort. Recognition that efforts to provide learning opportunities for children are hindered by health factors which determine educational participation and performance (POLLITT, 1990) has led to a broadening of the traditional emphasis on the provision of basic education to include the promotion of health interventions which influence the ability of children to benefit from the education provided. This approach has been endorsed this year by the World Conference on Education for All, held in Jomtien, Thailand, and by the United Nations ACC/SCN. Geohelminthiasis has particular relevance for the 'teachability' of school-age children because 2 consequences of infection—anaemia and growth retardation—are both linked with poor school performance, and because the most intense infections with the major geohelminths occur in the school-age group (HALLORAN et al., 1989). Delivery of treatment through the school system has been shown to be logistically and economically feasible, and has the capacity for integration with existing programmes that address school nutrition and health needs (JAMISON & LESLIE, 1990).

These initiatives clearly have major areas of overlap: programmes to improve the growth and development of children from a health perspective cannot be separated from those which aim to enhance participation in basic education; programmes which seek to enhance nutritional supplementation by parasite chemotherapy will inevitably deliver concomitant therapy for schistosomiasis and geohelminthiasis if both infections are limiting in the target community. Thus, although each of these initiatives has had a separate genesis, and each seeks to address a separate problem, they all form part of a global initiative to tackle a global problem. The degree to which they can in practice be integrated at the community level may ultimately determine their success.

References


