



Prevention and control of schistosomiasis and soil-transmitted helminthiasis

Comprehensive strategies for the prevention and control of worm infections, including regular deworming of those at risk, have potential for significant impact on child health, growth and cognitive development.

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List of abbreviations

CRC:

Convention on the Rights of the Child

IMCI:

Integrated Management of Childhood Illness

FRESH:

Focusing Resources on Effective School Health

NVAP:

National Vitamin A Programme

STH:

soil-transmitted helminth

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1. INTRODUCTION

The burden of disease associated with helminth infections (schistosomiasis and soil-transmitted helminth (STH) infections) is enormous, with at least 2 billion people affected worldwide. This is being increasingly recognized as a significant public health problem, particularly in developing countries, where poverty, poor nutrition, inadequate sanitation, lack of clean drinking-water and minimal health care prevail. The highest rates of infection are often in children between the ages of 5 and 15 years.

Although these helminths can infect all members of a population, the most vulnerable groups – those who are at most risk, and who would benefit most from preventive interventions – are **pre-school (age 2–5 years) and school-age children, adolescent girls, and women of childbearing age.**

Helminth infections have an adverse effect on cognitive development, and individuals in a period of intense physical and intellectual growth are extremely vulnerable. Despite increasing commitment to the health and learning of schoolchildren, progress on these fronts can be seriously threatened by helminth infections. Studies have shown clearly the detrimental effects of infection on educational performance and school attendance, as well as the significant improvements in language and memory development that can be realized following treatment. Helminth infections are also associated with nutritional deficiencies, particularly of iron and vitamin A, with improvements in iron status and increases in vitamin A absorption after deworming. Adolescent girls are particularly at risk of anaemia aggravated by helminth infection and iron stress.

In order to promote and protect the rights of each child, including the “right to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health” (CRC), illnesses that place an undue burden on child health and development must be effectively addressed. Furthermore, the creation of a safe, healthy, inclusive and equitably resourced educational environment, conducive to excellence in learn-

ing, is an important condition for fulfilling the right of all learners to an education of good quality.

In the outcome document of the United Nations General Assembly’s Special Session on Children in May 2002, *A World Fit for Children*, world leaders agreed to “reduce the incidence of intestinal parasites” and to “reduce by one-third the prevalence of anaemia, including iron-deficiency anaemia, by 2010”.

2. METHODS OF CONTROL

The overall objectives of preventing helminth infections and schistosomiasis are to improve children’s health, nutrition and learning capabilities and to improve women’s lives and their caring capacity, work efficiency and economic productivity.

Recent evidence confirms that a significant reduction in the burden of disease due to these infections can be achieved through regular anthelmintic treatment directed to all high-risk groups. Currently, a number of drugs are included in the WHO Model List of Essential Medicines for the single-dose treatment of soil-transmitted helminths and schistosomiasis. The price of anthelmintics has now decreased to a level that makes regular treatment both affordable and deliverable in a sustainable manner through existing channels. It is estimated that most of the disease burden due to soil-transmitted helminths and schistosomiasis can be prevented in high-prevalence communities by treating pre-school and school-age children.

Both albendazole (400 mg) and mebendazole (500 mg) offer the further advantage that they can be administered as a single tablet to all individuals over 2 years of age. These drugs are effective, well tolerated and inexpensive and can be safely given after the first trimester of pregnancy. They are also safe for children between 1 and 2 years of age (although the dose of albendazole has to be reduced to 200 mg). Praziquantel can now be easily administered according to height with the aid of a “dose pole” and is also safe for pregnant women throughout pregnancy. Studies in pregnant women have shown that deworming is beneficial for the course of pregnancy, and that combining treatment with iron–folate supplementation helps to improve iron status.

Anthelmintic treatment can be dispensed through health services (maternal and child health and antenatal clinics), school health programmes, and community interventions directed at other vulnerable groups (such as adolescent girls). Repeated and regular chemotherapy of those at risk ensures that levels of infection are kept below those associated with morbidity. Since reinfection is common, permanent control can be achieved only through regular treatment accompanied by long-term key preventive interventions in order to break transmission routes:

- provision and use of a safe and adequate water supply;
- improvement of environmental sanitation;
- good sanitation and hygiene habits.

On the basis of the latest evidence and of a risk–benefit analysis (which took account of drug safety and the potential damage caused by these parasitic infections if left untreated), a 2001 WHO informal consultation recommended that deworming campaigns should not exclude either children aged 12 months onwards or pregnant women and adolescents.

The WHO dose-pole is used by a teacher to determine the correct dose of praziquantel.



3. A COMPREHENSIVE STRATEGY

A comprehensive control strategy for helminth infection should include:

- ensuring wide availability of anthelmintics for schistosomiasis and soil-transmitted helminth infections in all health services in endemic areas;
- ensuring good case management of symptomatic cases (e.g. IMCI);
- regular treatment of all children at risk, including adolescent girls, through school- and community-based initiatives;
- treating pregnant women at risk, through antenatal care and other women's health programmes;
- ensuring a safe water supply and adequate sanitation facilities in all schools;
- ensuring provision of potable water and sanitation facilities at household/community level;
- promoting good hygiene and sanitation practices among schoolchildren and caregivers (hand-washing, use of latrines, use of footwear) through community capacity development activities and in school curricula.

South Africa deworming schoolchildren for improved learning

In a rural settlement of Cape Town, South Africa, teachers and parents noticed that children were falling asleep in school and were passing large numbers of worms, either in faeces or by vomiting. A large survey in all 12 primary schools in the area found that more than 95% of all children were infected with worms. These startling findings prompted the formation of a Task Team to raise resources from private companies to deworm the children. Every 6 months, teachers and school health nurses dewormed more than 11 000 children, reducing the proportion of children infected to less than 20%. Capitalizing on the success of the deworming programme, the Task Team continued their work with the school communities. As a result, all schools have established action plans to improve the school environment and have integrated hygiene education into their curricula; the local government has started to prioritize the area for sanitation resources.

The following important points should be kept in mind in planning a programme for control of helminth infections:

- Although regular treatment will help all children to avoid the worst effects of infection, long-term control will be achieved only if **regular treatment** of at-risk groups is accompanied by improvements in **sanitation** and **hygiene**.
- Full impact on health will not be achieved unless helminth control is implemented as part of a **larger maternal and child health strategy**, aimed at reducing the burden of **anaemia** in women, children and adolescent girls.
- Where feasible, opportunities should be sought for synergy between control measures for soil-transmitted helminths and schisto-

somiasis and those for the control and elimination of other parasitic diseases such as onchocerciasis and lymphatic filariasis.

Implementation of any helminth control programme will require strong linkages with key programmes at the country level that are already in place to reach women and children, working through existing regional, national and local activities. This could include:

- IMCI, including community IMCI;
- school-based programmes such as Sanitation and Hygiene, and FRESH (Focusing Resources on Effective School Health);
- vitamin A supplementation programmes;
- maternal and child health;
- reproductive health; Making Pregnancy Safer being included;
- Roll Back Malaria;
- Expanded Programme on Immunization;
- water and environmental sanitation.

Nepal integrates deworming activities with vitamin A supplementation

The Nepal National Vitamin A Programme (NVAP) provides an excellent opportunity to reach virtually all young children twice a year. Phased integration of deworming of children aged 2–5 years (single dose of albendazole, 400 mg) was therefore initiated in 14 districts in October 1999. The integration has now reached 64 districts and the remaining districts will be covered during 2004.

The experience gained from integrating deworming with the vitamin A programme is positive. Since deworming is a very popular intervention, it lends even more importance to the twice-yearly distribution days and increases the appreciation of the community volunteers who conduct the distribution. Nutrition mini-surveys conducted after the introduction of deworming have consistently shown high coverage of both vitamin A and deworming, with more than 85% of children being reached. Furthermore, after the initial training, no additional costs are associated with deworming beyond the cost of the tablets themselves.

The results of a recent study of the impact of deworming were remarkable. After only two rounds of treatment, the prevalence of helminth infection was reduced by 44% and there was a dramatic reduction in infection intensity. As a result, there was a 77% reduction in anaemia prevalence, from 47% at baseline to 11% after the two distribution rounds. The study clearly shows that deworming will have far-reaching implications for child growth and cognitive development in Nepal.

4. CONCLUSION

Deworming improves health, nutrition and physical development, makes pregnancy safer and improves birth outcomes. It is inexpensive, with a school-based deworming programme typically costing between US\$ 0.25 and 0.50 per child per year.

The treatment is safe, even in pregnancy and when given to uninfected children. Finally, deworming can easily be added to existing activities and programmes in health services, in school health programmes and in special health campaigns. When regular deworming is accompanied by appropriate sanitation and hygiene activities designed to prevent reinfection, a long-term impact can be achieved.

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