

COMBATING NEGLECTED TROPICAL DISEASES: SCHISTOSOMIASIS



Administering PZQ in Africa

At the University's School of Biological Sciences, researcher Francisca Mutapi and her team are making a very real difference in the lives of young African children. Through their efforts, and the world-class expertise and resources available at the School, children previously ignored in drug programmes may be saved from what has been proven to be the second most deadly parasitic infection of public health concern across the continent, after malaria.

Fighting a deadly disease

Schistosomiasis is a disease of poverty that leads to chronic ill-health, caused by contact with fresh water infested with the larval forms of parasitic worms, known as schistosomes. The adult worms live in the veins draining the urinary tract and intestines, and can cause severe damage because of the body's immune reaction to them. The disease affects more than 100 million people in all parts of Africa, with children being most at risk. Francisca Mutapi and her team have studied the immunological consequences of urogenital schistosomiasis for several years. Their research has shown that the drug Praziquantel (PZQ) - the only control measure currently available - accelerates the development of acquired schistosome-specific immunity favouring responses associated with protection against reinfection.



PZQ EXTENDED DOSE POLE

The University was also instrumental in the validation of an extended dose pole for use in the field when treating preschool children with Praziquantel.

PZQ doses to children are calculated based on patient weight. The Mutapi lab contributed data to a study analysing results from several developing countries, which showed that a child's height can be used as a simple but accurate proxy for weight when calculating the correct dose for preschool children, as occurs in primary school children and adults.

The modified dose pole is now deployed across the developing world for PZQ administration.



Treatment has been extended to under fives





The disease is transmitted through infected water



In affected populations, children carry the heaviest burden of schistosomiasis. PZQ drug programmes, however, generally excluded children under the age of five, as this age group had not been evaluated for the effectiveness of the treatment, and were thought to be low risk. As a result, several million young children were potentially exposed to infection with schistosomes and associated diseases.

Mutapi and her Edinburgh team, working with collaborators at the University of Zimbabwe and elsewhere in Mali and Sudan, demonstrated that schistosome infection rates in the under-fives are actually higher than in adults already enrolled in mass drug administration (MDA) programmes. Their data also showed that not only is PZQ safe for preschool children, it is as effective at treating schistosome infection in this age-group as it is in older children.

The results obtained by Francisca's team in Zimbabwe were presented alongside those from other regions of Africa at a World Health Organization (WHO) workshop in September 2010. In September 2012, a new MDA programme was begun in Zimbabwe, which has already treated almost 350,000 preschool children for the first time. The University now leads a monitoring and evaluation survey that has shown that the new MDA programme has been extremely successful in reducing *S. haematobium* infection in preschool children, and is significantly reducing the risk of longterm morbidity.



The findings of this Edinburgh-based research have had far-reaching effects, culminating in changes to the WHO's policies on MDA programmes for the treatment of schistosomiasis.

The Chair of the 2010 WHO workshop on schistosomiasis said:

"This ongoing programme and evaluation study in Zimbabwe will help many thousands of children in the short term and several million in the long term."



Pre-school children are more at risk

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