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ULTRASOUND IN SCHISTOSOMIASIS

A Practical Guide to the Standardized Use of Ultrasonography for the Assessment of Schistosomiasis-related Morbidity

Second International Workshop
October 22 - 26, 1996, Niamey, Niger

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This report includes the views of an expert group, Satellite Symposium on Ultrasound Methodology in *Schistosoma mansoni* infection which met October 19-24, 1997, Belo Horizonte, Brazil

Editors: J. Richter, C. Hatz, G. Campagne, N. R. Bergquist, J. M. Jenkins

Addresses for correspondence

Dr J. Richter
Faculty of Medicine,
Clinics for Gastroenterology, Hepatology and Infectious Diseases,
Heinrich Heine Universität, Moorenstrasse 5,
D-40225 Düsseldorf., FR Germany
e-mail Joachim.Richter@med.uni-duesseldorf.de

Dr G. Campagne,
CERMES,
B. P. 10887
Niamey,
Niger
e-mail gerard.campagne@wanadoo.fr

Dr C. Hatz, Mrs J.M. Jenkins,
Swiss Tropical Institute,
Socinstrasse 57,
4002 Basel,
Switzerland
e-mail christoph.hatz@unibas.ch
Jennifer.Jenkins@unibas.ch

Dr N. R. Bergquist,
WHO/TDR
1211 Geneva 27
Switzerland
e-mail bergquistr@who.int

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INTRODUCTION

The aim of schistosomiasis control programmes is to reduce morbidity. However, most of the widely-used methods for assessing the success of interventions use parameters like egg-counts, which measure the level of infection but do not provide direct evidence about pathological changes. The planning of interventions so that they are effective in reducing damage to internal organs requires knowledge of what changes occur, how fast and how far they can be reversed by treatment, and how soon they appear again after reinfection. Ultrasonography is an excellent way of obtaining such information, not only in the hospital setting but in surveys at the community level, and it has been used for this purpose in many endemic areas. However, if these data are to be used to build up an overall picture on a world-wide scale that can be used as a basis for planning control programmes, it is necessary to have results that can be reliably compared. This is not always possible at present, because different investigators have selected different examination techniques and measurements out of the wide range of possiblilities available.

One solution to the problem of obtaining comparable data from different ultrasound studies is the use of standardized protocols for examination and reporting. The first step towards developing such protocols was taken in Cairo in 1990. At a workshop sponsored by WHO/TDR and the Swiss Tropical Institute, scientists, clinicians and control officers discussed their experience of using ultrasound in schistosomiasis, especially in surveys and field studies. They identified areas where more research was needed, and proposed a set of standardized examinations and reporting procedures. The results were published in detail in a review (Cairo Working Group 1992), and a White Paper Report with detailed practical instructions (WHO 1991).

As the participants in the workshop hoped, the publication of the White Paper Report led to a number of studies using the standard protocols. In 1996, a second workshop to discuss the accumulated experience was held in Niamey, Niger, in collaboration with the Centre for Research on Meningitis and Schistosomiasis (CERMES/OCCGE) A Brazilian expert group also met to discuss ultrasound methodology for *S. mansoni* infection at a Satellite Symposium of the 6th International Symposium on Schistosomiasis, Belo Horizonte, Brazil, in October 1997. The Niamey meeting concentrated on *S. haematobium* and *S. mansoni* infections, as new data were available for these species. Another workshop will review the protocols for *S. japonicum* and other species prevalent in Asia.

Part 1 of the present White Paper Report summarises the discussions at the Niamey Workshop and in Belo Horizonte, and Parts 2 and 3 present a series of protocols with detailed instructions for standardized procedures for ultrasonographic examination, forms for recording results, and information about calculating scores and indices of severity.

The procedures given are for *S. mansoni* and *S. haematobium*. Protocols for species prevalent in Asia are not included as these have not yet been revised. However, most of the investigations suggested for *S. mansoni* are equally relevant for intestinal schistosomiasis due to other species. Therefore it is recommended that until new protocols are published, studies should use the protocols given here for *S. mansoni*. Information on pathology specific to *S. japonicum* can be added using the 1991 protocols.

PART 1: REPORT OF THE WORKSHOP

1.1 AIMS

The aims of the Niamey workshop were :

1. to review the status of knowledge about morbidity resulting from schistosomal infection in different endemic areas, especially the pathological changes observed using ultrasound, and the way these change over time and in response to chemotherapy;
2. to discuss and revise the standard protocols for ultrasonography presented in the White Paper Report published in 1991, in the light of subsequent experience;
3. to formulate recommendations for treatment and retreatment strategies to be used in control programmes;
4. to establish priorities for future research.

1.2 MORBIDITY DUE TO SCHISTOSOMIASIS, AND ITS EVOLUTION AFTER CHEMOTHERAPY

Morbidity due to *Schistosoma haematobium* infection

The prevalence and severity of pathological changes detected by ultrasound correlate with the intensity of infection, as measured by the frequency and quantity of eggs excreted in the urine, and with indirect indicators like haematuria. In most endemic areas, a peak of morbidity is observed in children aged 7 - 14 years. Lesions observed using ultrasound are hydronephrosis, dilatation of the ureter and the formation of intravesical masses. Calcification of the bladder wall is a pathognomonic sign. Generally, hydronephrosis is the sign that has the most unfavourable prognosis.

Schistosomal infection, especially with *S. haematobium*, can cause lesions in both male and female genital tracts. There are reports that genital schistosomiasis affects reproductive health, and it has been suggested that the lesions present could offer an entry-point for other infections. Genital schistosomiasis has been relatively little studied, but some investigations of changes in the genital organs using ultrasound have been published (e.g. Abul-Khair et al.1980, Richter et al. 1995, Vilana et al.1997). It has also been suggested that liver abnormalities may also occur as a result of *S. haematobium*