Research abstract
New foci of schistosomiasis transmission in Yemen

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Objective

To assess the health impact of the Ibb sewerage project and the increasing incidence of schistosomiasis among inhabitants of Maitam valley.

Ibb sewerage project

The Ibb sewerage project is a treatment plant that uses an activated-sludge process. It was built in 1990 in the upper part of Maitam valley about 5 kilometres south of Ibb city. This project collects different kinds of waste by different means. The chemical treatment plant, which is supposed to kill harmful parasites, eggs, insects and bacteria, in order to make the treated sewage safe for human and animal use and to turn solid waste into manure, has not been used.

Design

A prospective, community-based control study, with general medical investigation.

Participants

Department of Community Medicine, Sana'a University, Ibb Governorate Department of Public Health, with the support of WHO's Regional Office for the Eastern Mediterranean.

Hypothesis

Increasing schistosomiasis transmission as a result of environmental pollution caused by the above-mentioned project has formed a new, additional source of schistosomiasis incidence in the valley.

Materials and methods

We completed, between April and September 1994, the testing, diagnosis and treatment of 3422 inhabitants of Maitam valley. Of these, there were 1290 controls from the upper part of the valley, which was not affected by the project, to compare and measure the health impact of the Ibb sewerage project.

The following tasks were performed:

1. A general medical examination.
2. A field tour to collect snail hosts, show them to the people, and measure their intensity in the water course.
3. A demographic survey of the population of the valley.
4. Urine tests (urine filtration Nuclepore technique).

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5. Stool tests (two Kato-Katz slides).
6. Daily health education lessons and seminars.

Samples represent:

1. Children up to five years of age (males and females).
2. Schoolchildren aged 6 15 years (males and females).
3. Adults 16 years of age and above (males and females).

Results

1. The type of snail hosts that were found in the valley's water course was *Biomphalaria pfeiffri*, and the snails' density in the water was 5%.
2. The demographic survey shows that the population of the area is 20 334. This figure is higher than the 1986 census result by 4670, which means a 3.3% average annual growth.
3. *Schistosoma mansoni* was found in both cases and controls. No *Schistosoma haematobium* was found despite the careful urine test by membrane filtration.
4. The incidence of *S. mansoni* in the part of the valley where the water is contaminated by the Ibb sewerage project was 14.8%, and was greater in males than in females (17.7% and 11.9%, respectively). In schoolchildren it was 20% in males and 12% in females
5. By comparison, in the control group, who live in the upper part of the valley and do not use the water contaminated by the sewerage project, we found that the prevalence was only 4.6%. It was also greater in males (8%) than in females (1.4%); in schoolchildren it was 12% in males and 3.4% in females.

Conclusion

By comparing the prevalence of *S. mansoni* in the lower part of the valley, where the water is contaminated by the Ibb sewerage project, with that in the control group, who live in the upper part of the valley where the water is not contaminated by the project, we found a significant difference (15% and 5% respectively: odds ratio = 2.9). This suggests an urgent need for chemical treatment of the water emitted from the Ibb sewerage project (manure factory), by using chlorine, other insecticides and filtration to destroy the parasites, eggs, snails, various insects and active bacteria, under the supervision of the General Directorate of Public Health in Ibb Governorate.