Research abstract

Evaluation of an integrated approach to schistosomiasis control in a resettlement area west of Alexandria

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Introduction

Mariout, 40 km to the west of Alexandria, was chosen for this WHO-supported project. The area studied consisted of lands reclaimed from the desert, in which agriculture constitutes the main activity and in which the irrigation system is the classic Egyptian type (irrigation canals and drains).

In a previous study carried out by the author between 1988 and 1991, a schistosomiasis control programme was undertaken in this area. The base situation of schistosomiasis was established on a sample of three villages with a total population of 6577 individuals. The prevalence of *Schistosoma mansoni* in the three villages was 22%, 28% and 40%. Survey of the water channels revealed that 60%–80% of them dried up in between the irrigation rounds. *Biomphalaria alexandrina* was detected in channels permanently containing water. The proportion of infected snails was unexpectedly high (7.5%, 15.8% and 17.3%).

In 1989, all schistosomiasis-positive cases were called for treatment with a single dose of praziquantel (40 mg/kg body weight). This was followed by an abrupt drop in the disease prevalence of infection to 18.5%, 14.9% and 15.4%.

In 1990, snail control using 70 ppm of the dry form of the plant molluscicide *Ambrosia maritima* (*damsissa*) was applied. This led to a 90% drop in the snail population and in the number of infected snails. Schistosomiasis prevalence revealed a further slight decline, with the disease prevalence rates becoming 17%, 14% and 12%. No control activities were undertaken thereafter.

Objectives

The aims of the present project were to:

- determine the level of schistosomiasis in the area, three years after cessation of control measures;
- find an explanation for cases converting to positive;
- find an explanation for cases reverting to negative.

Results

Revision of the census data in 1993 demonstrated an overall net increase of the population (including new settlers) of 14.6% as compared to the census of 1988. The prevalence of *S. mansoni* was still on the decline

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and the rates had become 13.6%, 14.4% and 9.0%. A survey of the water channels did not reveal any significant changes in the total length of the water channels or of the infected ones. The water network had not been modified. The snail population had increased compared to the base findings, but the proportion infected was very low (0.0%, 0.5% and 0.9%).

A study of conversion indicated that the yearly incidence was 11%, whereas it was 14% before control. It was found that 20% of converting cases reported working outside the area, 21.5% were new settlers and the remaining 60% were probably infected locally. A study of reversion revealed that only 7% of positive cases had been treated in the previous three years. It was found that 30% of the cases were missed by the Kato technique (2 slides). The Kato technique was used in low infection intensity (fewer than 100 eggs/g). The remaining 63% could be considered self-cured during

the three-year period. This finding could be explained by the fact that the mean life of the *S. mansoni* adult worm is 3–4 years. Accordingly, in the absence of re-infection, 20%–30% of the infected individuals might lose their infection every year.

Conclusions

It was concluded that an integrated programme, applied once, could control schistosomiasis in both the human and snail hosts for a period of four years under the conditions prevailing in the reclaimed areas. However, transmission was not stopped, and the increase in the snail population points to the possibility of resumption of the original level of infection. The findings generally call for a second application of integrated control measures after three years.