

SHORT COMMUNICATION

## Replacing Oxamniquine by Praziquantel against *Schistosoma mansoni* Infection in a Rural Community from the Sugar-cane Zone of Northeast Brazil: an Epidemiological Follow-up

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*A group of 52 villagers was followed-up for three years regarding Schistosoma mansoni infection. All villagers were periodically surveyed by the Kato-Katz method. In March 1997 and March 1998 the positives were treated with oxamniquine (15-20 mg/kg), and in March 1999, with praziquantel (60 mg/kg). All infection indices decreased substantially between March 1999 and March 2000: prevalence of infection (from 32.7% to 21.2%), prevalence of moderate/heavy infection (from 7.7% to 1.9%), intensity of infection (from 23.1 epg to 7.4 epg) and reinfection (from 35.7% to 14.3%). Negativation increased from 53.8 to 82.4. An optimistic prognostic is assumed in the short term for the introduction of praziquantel in the study area.*

Key words: schistosomiasis - control - chemotherapy - Northeast - Brazil

Araújo is a small rural village in the municipality of São Lourenço da Mata, State of Pernambuco, which has held alarming prevalence levels despite four chemotherapy campaigns with oxamniquine against schistosomiasis by the Fundação Nacional de Saúde (Funasa), as follows: 30.2% (May 1979), 22.4% (September 1982), 79.2% (March 1986) and 71.7% (January 1996). In March 1997, all villagers over one year of age were surveyed by the Kato-Katz (Katz et al. 1972) method (one sample; two slides) and the positives were given a single oral dose (15-20 mg/kg of body weight) of oxamniquine. Kato-Katz surveys (two samples; two slides each) of the villagers were made in July 1997 and March 1998, and the positives from the latter were treated with oxamniquine. The villagers were surveyed

again in July 1998 and March 1999. The positives from this survey were then treated with praziquantel (60 mg/kg), and the villagers were subsequently surveyed in July 1999 and March 2000. A socio-economic questionnaire was applied house-to-house in March 1997 and September 1999. Relative abundance and natural infection of the local snail host, *Biomphalaria straminea*, were estimated monthly as described by Pieri et al. (1998) and Favre (1999), respectively. Aiming to gather epidemiological information about the replacement of oxamniquine by praziquantel in the village, a follow-up group of fully complying villagers was then identified, from which the following indices were calculated (WHO 1993): (i) prevalence of infection – percentage of surveyed persons with eggs per gram of feces (epg) >0; (ii) prevalence of moderate to heavy infection – percentage of surveyed persons with epg >100; (iii) intensity of infection – arithmetic mean of epg; (iv) negativation – proportion of positive persons who become negative four months after treatment; (v) reinfection – proportion of negativated persons who become positive again 12 months after treatment. Differences in intensity of infection among the successive surveys were evaluated at the 5% significance level through one-way analysis of variance for repeated measures performed on the  $\log_{10}(x+1)$  transformed values of

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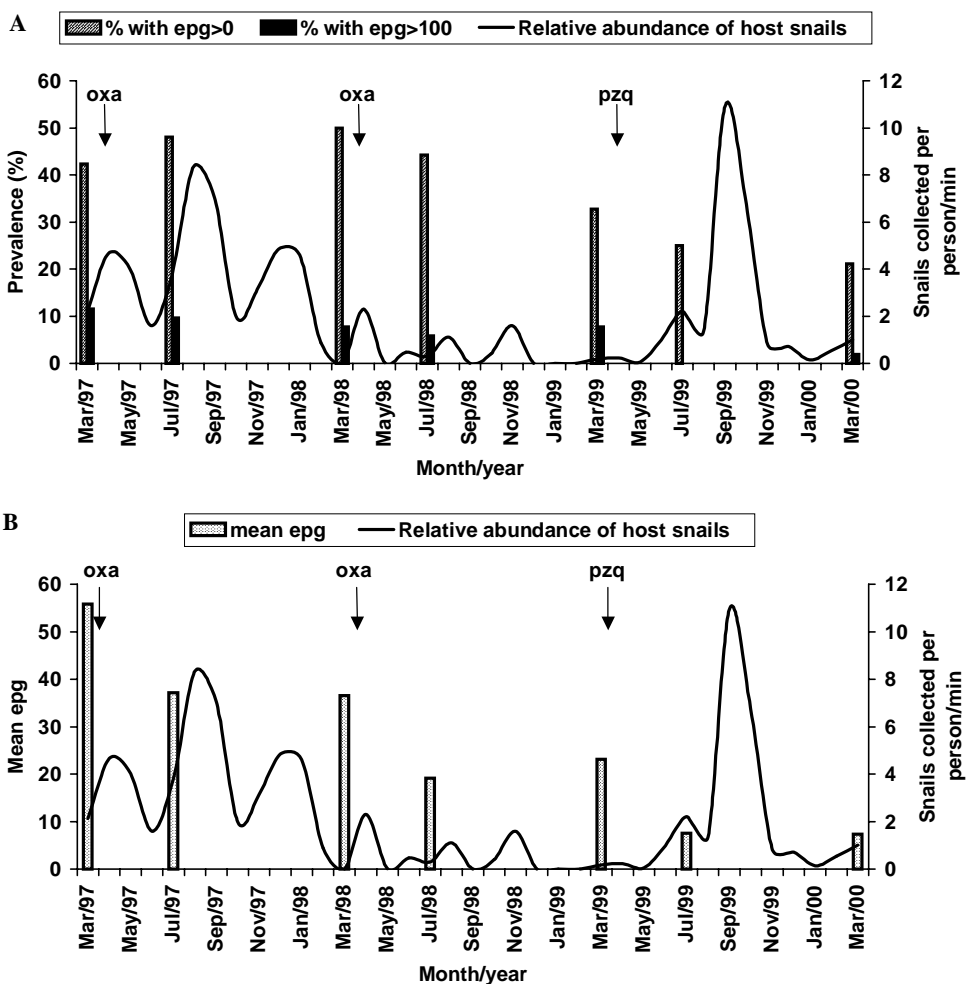
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egg. Multiple pair-wise comparisons of egg between surveys were evaluated by Tuckey's HSD test (Sokal & Rohlf 1995).

The data obtained from the follow-up group are depicted in the Figure and detailed below. Prevalence of infection decreased 9.6% (from 42.3% in March 1997 to 32.7% in March 1999) after two treatments with oxamniquine and 11.5% (from 32.7% to 21.2%) after one treatment with praziquantel. Prevalence of moderate to heavy infection decreased 3.8% (from 11.5% to 7.7%) after two treatments with oxamniquine and 5.8% (from 7.7% to 1.9%) after one treatment with praziquantel. Intensity of infection decreased 58.6% (from 55.8 egg to 23.1 egg) after two treatments with oxamniquine and 68% (from 23.1 egg to 7.4 egg) after one treatment with

praziquantel. Mean egg from the March 1997, July 1997 and March 1998 surveys were significantly higher than the ones from July 1999 and March 2000 ( $F_{(6, 306)} = 4.717$ ;  $p < 0.05$ ; HSD = 0.366). Negativation was 40.9% and 53.8% after the first and second oxamniquine treatment respectively, and 82.4% after the praziquantel treatment. Reinfection was 33.3% and 35.7% after the first and second oxamniquine treatment respectively, and 14.3% after the praziquantel treatment. Monthly relative abundance of *B. straminea* averaged 2.21 snails collected per person per minute between March 1997 and February 1999 and 1.99 snails/person/min between March 1999 and March 2000. Snail natural infection by *S. mansoni* averaged 0.03% between March 1997 and February 1999, and 3.9%



A: prevalence of infection (% with egg>0), prevalence of moderate to heavy infections (% with egg>100); B: arithmetic mean of eggs per gram of feces (mean egg) in a fully complying follow-up group of 52 persons (1-70 years old) from Araújo, a rural village in the sugar-cane zone of Pernambuco. Monthly estimates of the relative abundance of the local snail host, *Biomphalaria straminea*, are also given. The arrows indicate the times of medication with oxamniquine (oxa) and praziquantel (pzq).

between March 1999 and March 2000. In March 2000 it reached 25.8% (20 positives out of 66 snails examined). The socioeconomic surveys showed that the population decreased 8.9%, from 203 (March 1997) to 185 (September 1999) residents. During that period the village remained without sanitation or piped water and the average monthly income of 65.8% of the families was below the minimum wage.

The present study does not provide comparative information about the impact of oxamniquine and praziquantel in the study area because the patients were not randomly assigned to either treatment. However, it strongly suggests that replacing oxamniquine by praziquantel substantially reduced all infection indices in the follow-up group. In the short term, it is reasonable to assume an optimistic prognostic for the community as whole, since this group represented 28.1% of the population remaining in the village by the end of the study. This is relevant for schistosomiasis control at the community level in highly endemic areas, because only recently praziquantel has been introduced by the Funasa as the drug of choice in campaigns, and the present study is the first published report of its impact in the sugar-cane zone of northeast Brazil.

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