

RESEARCH NOTE

Potential Spread of Schistosomiasis in the Periphery of Greater Metropolitan Region of Rio de Janeiro

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In Brazil and other developing countries, the process of land occupation resulting from the prevailing economic development model and the existing social inequalities superimposed on a territorial base have produced a major impact on the epidemiological profile of endemic diseases.

The introduction of schistosomiasis in Brazil has been historically attributed to the arrival of the first African slaves in the mid-16th century. From the main gateways they were taken to the sugar cane cultivation in the coastal area of northeastern Brazil, where ecological conditions were favourable for establishing schistosomiasis. From there, the endemic area gradually expanded northwards and southwards with other agricultural crops.

The district of Santa Cruz is located in the west area of Rio de Janeiro and in order to better understand the occupation of this area it is important to highlight certain relevant historical aspects. Referring once again to the Colonial Period of Brazil,

the arrival of the first Jesuit missionaries in the late 16th century gave rise to farming and cattle-raising in the area, previously considered inadequate for such economic activities because of its peculiar peat bog terrain, prone to flooding. These natural difficulties were overcome with the development of an efficient drainage system including dikes, ditches, and canals. Economic growth in Santa Cruz lasted until 1760 when the Jesuits were banned from Brazil.

In the last four decades it was observed a continuous migration into the Santa Cruz Industrial District, with no adequate land use planning, the silting-in of ditches and canals, a phenomenon that actually began when the Jesuits were expelled from the area, became worse in the recent years of industrial development, finally leading to a severe flood of the entire Santa Cruz Lowland during the heavy rains in the summer of 1996.

With these heavy rains came an outbreak of leptospirosis and fieldwork teams from the Brazilian National Health Foundation (FNS) were called into the area. While these FNS teams were in the area they noticed an unusually large number of snails in both the existing water bodies and flood areas, including peridomiliary areas.

Based on the above-mentioned observation, we began collaborating with the FNS in studies to monitor the presence of individuals infected with *Schistosoma mansoni*, the existence of autochthonous cases, and the identification of the intermediate host species, as well as the positive infection rate in the latter.

The first step was to search for the possible transmission area. This was done by examining a relative small number of faecal specimens from a suspected area where 200 individuals were examined and three were found positive for *S. mansoni*.

The limits of the study area were fixed to include the areas with the greatest concentration of recent land invasions, a quadrangle of which the borders were the Itá, Goiaba, Pau da Flecha and Vala da Goiaba canals.

In initial parasitological survey a sample of the population were selected and school-children from three local schools were chosen. The work also involved setting up a field laboratory in one of the public schools.

From the stool examination of 1929 school-children, the following helminth prevalence was found: 2% for *S. mansoni*, 56% for *Ascaris lumbricoides*, 32% for *Ancylostoma* sp., and 55% for *Trichuris trichiura*.

A study on snails population dynamics was also performed with monthly captures in all the water bodies, both perennial and seasonal. In the latter the captures were performed until the breeding

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place dried up and was totally devoid of molluscs. The snails were taken to the laboratory, where they were exposed to artificial light every three days for a month, in order to study the natural infection rate. After this period the snails were sacrificed to perform systematic morphological studies of the shells and soft parts.

With regard to malacology, 2131 snails were examined, none of which eliminated *S. mansoni* cercariae, but *Cercaria caratinguensis* and *C. minese* were eliminated. Results of identification of planorbids based on internal morphological studies showed that of the 18 breeding sites investigated, 3 displayed the coexistence of *Biomphalaria tenagophila* and *B. glabrata*, 3 were inhabited exclusively by *B. glabrata*, and 12 were inhabited by *B. tenagophila*.

Since *B. glabrata* was found in this region, which is known to harbour *B. tenagophila* (WL Paraense 1975 *Arq Mus Nac* 55: 105-128), we began a malacological survey of the ditches and drainage canals interlinking the previously demarcated quadrangle. Such observations led us to study the distribution of the molluscs beginning at the Serra da Paciência hill range. To date we have observed that two of the three breeding sites investigated display the coexistence of *B. glabrata* and *B. tenagophila*, while the third is inhabited exclusively by *B. tenagophila*, and none of the 1173 snails observed eliminated *S. mansoni* cercariae.

However, at this point of the research it is very premature to be conclusive about *B. glabrata* dispersion into *B. tenagophila* natural breeding sites. The observations on snail distribution carried out

so far indicated Serra da Paciência as the possible *B. glabrata* main focus where it could be introduced accidentally in one of the artificial pounds made for aquaculture purposes.

As the work progressed, other areas of Santa Cruz and adjacent neighbourhoods were incorporated into the epidemiological studies. The survey area is now close to the Serra da Paciência hill range. So far 400 individuals were examined and 5 persons were found to be infected with *S. mansoni*, 3 from the same family, all reporting not having left the area (Antares).

Although much of the information on schistosomiasis has focused on transmission in rural areas, surprisingly little attention has been given to urban schistosomiasis, which is a reality rather than a potential threat (RF Sturrock 1989 *Mem Inst Oswaldo Cruz* 84, Suppl 1:134-148). For instance, there have been few reports on transmission of the disease in Rio de Janeiro, although it is well-known that this city has continuous migration of infected persons from highly endemic areas (A Suassuna & JR Coura 1969 *Rev Soc Bras Med Trop* 3: 59-71).

With regard to Santa Cruz Lowland, we conclude that it is a new transmission site in Rio de Janeiro, albeit still with a low prevalence. Considering just the bio-ecological components of the structure of endemic diseases themselves, we can say that this area displays favourable conditions for the entry and expansion of schistosomiasis mansoni. In addition, observing the health/disease process with its broader dimensions, we note that schistosomiasis is closely linked to the way of life of marginalized populations.