

Rev. Inst. Med. trop. S. Paulo
50(2):117-119, March-April, 2008

ABDOMINAL ULTRASOUND IN THE EVALUATION OF FIBROSIS AND PORTAL HYPERTENSION IN AN AREA OF SCHISTOSOMIASIS LOW ENDEMICITY

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SUMMARY

This study was undertaken in the municipality of Bananal, São Paulo, an endemic area for schistosomiasis with a prevalence under 10% and low parasite load among infected individuals. Our objective was to identify the clinical forms of schistosomiasis among 109 patients in whom the disease had been diagnosed through direct fecal analysis and who had been medicated with oxamniquine at the time of the Plan for the Intensification of Schistosomiasis Control Actions (1998-2000). These patients were submitted to an abdominal ultrasonography and fecal analysis by Kato-Katz method, four years, on average, after the end of the Plan. Five patients, whose abdominal ultrasound images were compatible with either peripheral or central periportal fibrosis and portal hypertension, were identified. None of the 109 patients presented *Schistosoma mansoni* eggs at fecal analysis. Ultrasonography is a sensitive, noninvasive diagnostic method that allows a better identification of the extent of liver involvement in schistosomiasis cases.

KEYWORDS: Schistosomiasis; Ultrasonography; Periportal Fibrosis; Plan of control.

INTRODUCTION

The municipality of Bananal, situated in the Paraíba river valley, State of São Paulo, had its first cases of schistosomiasis notified in 1976. Since then this municipality has been classified as an area of low endemicity for this parasitosis, with about 8% of the population infected and with the positive coproscopies revealing less than 100 eggs per gram of feces. As regards clinical forms, only oligosymptomatic and asymptomatic forms were characterized^{9,11}. Despite that, the municipality presented persistent prevalence, with a notable increase in the dynamics of transmission. This area presented the highest rates of autochthonous cases in the region covered by SUCEN -Taubaté, DIR XXIV (SUCEN, 2001).

In 1996, with the change in municipal administration, the control of schistosomiasis became a priority health action. As part of this process the Plan for the Intensification of Schistosomiasis Control Actions (1998 - 2000)^{9,11}, presented a great challenge to the local executive staff, involving various administrative levels and coordinated by the "Superintendência de Controle de Endemias" of the Health Department of the State of São Paulo (SUCEN) together with the Municipal Health Department. This plan aimed at reducing the average prevalence of schistosomiasis from 8% to less than 1%, by means of the identification of infected people, followed by treatment with oxamniquine and the introduction of control measures, namely the

greater extension of basic sanitation, health education and social mobilization¹⁰. This process was adopted in parallel with the reconstruction of the local Unified Health System, which permitted greater access of the local population to the health actions undertaken. Four years after the implementation of the plan, the objective had been fully achieved. There persisted, however, some questions as to the organic alterations, which the schistosomiasis might have caused in those individuals who had been infected and reinfected during the period prior to the implementation of the Plan. The notification cards did not identify alterations in the physical examination, such as hepatomegaly and splenomegaly⁹. The absence of these data could have resulted from inadequate observation on the occasion of the notification, but could suggest from the presence of only less severe cases of infection (intestinal form).

The use of ultrasonography in patients with schistosomiasis permitted great advances in the identification of hepatic, splenic and portal alterations and increased the sensitivity of clinical assessment². The clinical classification of schistosomiasis is subjective and a wide variety of judgments has been observed in Brazil, Uganda and Senegal⁷. Further, ultrasonography allows the identification of periportal fibrosis in patients with schistosomiasis. Thus, this method allows a more detailed and standardized analysis of the alterations produced by schistosomiasis infection. The classifications based on it are more reliable than on the clinical examination alone³.

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The objective of this study was to evaluate the organic repercussion of schistosomiasis mansoni by ultrasonographic assessment of hepatic, splenic and portal alterations in inhabitants of the municipality of Bananal. This assessment was undertaken four years, on average, after the introduction of specific treatment, using the Niamey's protocol¹².

CASUISTIC AND METHODS

A descriptive study was undertaken in 2004, four years, on average, after the parasitologic diagnosis and specific chemotherapy during the implementation of the Plan for the Intensification of the Schistosomiasis Control Actions, between 1998 and 2000. The study began with the active search for the 301 patients that were identified during the above mentioned Plan. One hundred and nine individuals agreed to participate in this study and signed the Document Informed Consent, approved by the Ethics in Research Committee of the "Hospital das Clínicas" of the University of São Paulo School of Medicine.

These patients underwent abdominal ultrasonography, in accordance with Niamey's protocol¹² and a fecal analysis by the Kato-Katz method⁵ (two slides of a single sample). All the ultrasonographies were undertaken by the same physician, trained in the above protocol, using portable Logik Book-GE equipment, with a convex catheter of 3.5-5 MHZ. The stool examinations were undertaken in the SUCEN laboratories in São Paulo.

RESULTS

The 109 patients' ages varied between 11 and 71 years (mean 33 years \pm 15.8; median 32 years), 71.5% males. All of them had been treated with one single dose of 15 mg/kg of oxamniquine on the occasion of the parasitological diagnosis obtained during the execution of the Action Plan for Schistosomiasis Control (1999-2002).

The parasitological exams were negative in all cases. As regards

the ultrasonography, 89 patients (81.7%) were found to be normal according to the protocol, and five (4.6%) presented hepatic alterations and the portal circulation characteristic of schistosomiasis, i.e. central and peripheral periportal fibrosis. Among the other patients, 12 presented hepatic images compatible with steatosis, one with cirrhosis and two presented images of a cyst and of a scar due to trauma.

The detailed characterization of the findings of the five patients, with alterations characteristic of schistosomiasis can be seen in Table 1.

DISCUSSION

The present study demonstrated that five of 109 individuals that had been treated for schistosomiasis four years before the present exam, presented abdominal ultrasonography abnormalities suggestive of periportal fibrosis with or without portal hypertension.

The clinical classifications of schistosomiasis, based exclusively on the physical examination, are highly subjective and, consequently, great variations in the clinical interpretations of the cases examined have been observed in different countries⁶. These classifications have not taken into account the presence of periportal fibrosis and, classified as intestinal, cases which are, in fact, hepato-intestinal forms. For this reason, the classifications based on the ultrasonographic examination allow a better assessment of the pathological processes installed⁴. On the other hand, the use of hepatic biopsy, considered the best method for the diagnosis of hepatic alterations due to schistosomiasis, has its use naturally limited as it is an invasive procedure, applicable only in a hospital setting, and usually not indicated⁸.

Alterations attributable to schistosomiasis were found in five of the 109 patients enrolled in this study. Hepatic alterations were detected in these five patients which, according to Niamey's protocol¹², revealed the presence of peripheral and central periportal fibrosis with portal hypertension in two of them, peripheral periportal fibrosis in one patient

Table 1

Characterization of the findings in five patients with ultrasonographic alterations attributed to schistosomiasis, in the municipality of Bananal, State of São Paulo, in 2004

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Age	42	38	37	71	70
Parasite burden (epg) **	78	168	24	78	96
Periportal fibrosis thickening	central and peripheral	central and peripheral	central	peripheral	central
Diameter of the portal vein (mm)	13.6*	13*	10.7	10.7	8.7
Thickening of the wall of the 2 nd portal branch (mm)	5*	6*	5*	3	3
Thickening of the wall of the gallbladder (mm)	5*	7.8*	4*	2	3
Final diagnosis	periportal fibrosis associated with portal hypertension	advanced periportal fibrosis with portal hypertension	periportal fibrosis	periportal fibrosis	periportal fibrosis

*higher than normal according to the Niamey's protocol (2000); **Parasite burden (eggs per gram of feces), diagnosis undertaken during the Plan for the Intensification of Schistosomiasis Control Actions (1998-2000).

and central periportal fibrosis in the other two. None of patients had splenomegaly. Thus, even in view of the low prevalence of hepatic and portal circulation alterations, the importance of the use of ultrasonography in the individual assessment of schistosomotic patients is evident, as it allowed the detection of morphological and functional alterations which may have important clinical consequences. Further, the thickening of gallbladder's wall, observed in three of the patients, may indicate an irreversible fibrosis³. It should be noted that, on the occasion of the exam, all the patients had negative fecal analysis, demonstrating the effectiveness of control actions^{9,11}, although a single negative stool exam does not rule out the diagnosis.

Finally, we should consider that the ultrasonographic study four years after the specific treatment of the population, probably detected fewer alterations than if the study had been carried out on the occasion of the parasitological diagnosis, because it is known that the reversion, even if only partial, of the fibrosis and the consequent functional alterations, may occur after specific treatment¹. In this study we did not perform physical examination, so it was not possible to compare the clinical forms obtained by this approach with the ultrasound.

Despite the small number of cases evaluated, the strategy used in this study tends to fill a gap which has existed in the assessment of the impact of schistosomiasis on the health of the inhabitants of Bananal, perceived during the implementation of the Plan for the Intensification of Schistosomiasis Control Actions from 1998 to 2000.

RESUMO

Ultra-sonografia abdominal na avaliação de fibrose e hipertensão portal em área de baixa endemicidade de esquistossomose

Este estudo desenvolveu-se no município de Bananal, São Paulo, uma área endêmica para esquistossomose com prevalência menor que 10% e baixa carga parasitária nos infectados. Teve como objetivo a identificação de formas clínicas da esquistossomose mansoni através do exame ultra-sonográfico, em 109 pacientes diagnosticados parasitologicamente e medicados com oxamniquine, durante a realização do Plano de Intensificação das Ações de Controle da Esquistossomose mansônica (1998-2000). Foram utilizadas a ultra-sonografia abdominal e exames de fezes (Kato-Katz) realizados após o término do plano, quatro anos em média. Nesta casuística, foram identificados cinco pacientes com imagens ultra-sonográficas abdominais compatíveis com fibrose periportal periférica ou central e hipertensão portal, além da negatividade de todos os exames parasitológicos nos 109 pacientes.

A ultra-sonografia, um método de diagnóstico sensível e não invasivo, possibilitou a identificação de casos com comprometimento hepático em uma área de baixa endemicidade para esquistossomose mansoni.

ACKNOWLEDGMENT

The authors are indebted to Dr. Anna S. Levin for her kind revision of the manuscript.

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Received: 20 April 2007

Accepted: 28 November 2007