

## Short Report

## Four years' follow-up of hepatosplenic morbidity in a recently emerged focus of *Schistosoma mansoni* in northern Senegal

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Recently, *Schistosoma mansoni* was introduced in the Senegal river basin due to environmental changes following extensive agricultural development and the building of 2 large dams in the area (OMVS, 1984; HANDSCHUMACHER *et al.*, 1992). The first case was detected in 1988 and the infection spread epidemically thereafter. By 1990 prevalences ranged between 45 and 70% (TALLA *et al.*, 1990).

In August 1991 a cross-sectional survey of 398 randomly selected subjects (all ages) from Ndombo, a village near Richard-Toll, was performed in order to determine the epidemiology and morbidity of this schistosomiasis focus in an early stage of endemicity. In August/September 1994 another random population sample of 272 individuals (all age groups) from the same village was examined similarly. The parasitological and clinical methods used have been extensively described elsewhere (STELMA *et al.*, 1993, 1994). Organomegaly was estimated by palpation in a supine position by the same physician at both times. Hepatomegaly was defined as a liver extending more than 2 cm under the right costal arch (mid-sternal and mid-clavicular lines). Splenomegaly was recorded whenever the spleen was palpable.

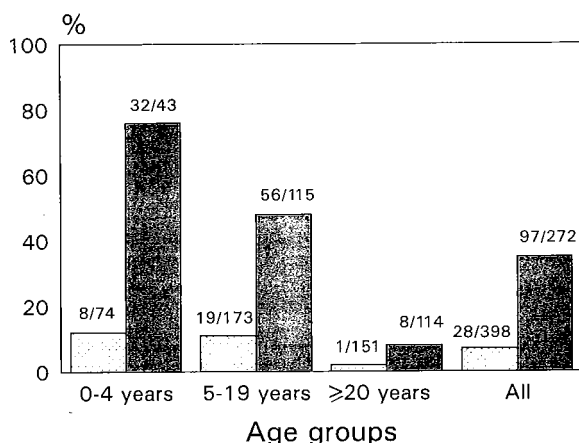


Figure. Left lobe hepatomegaly in a community recently exposed to *Schistosoma mansoni* in northern Senegal, in 1991 (hatched bars) and 1994 (solid bars).

In the 1991 population sample, the prevalence of *S. mansoni* was 91% and the geometric mean number of eggs per gram of stool was 646. In addition, thick blood film examination showed that 5% of the sample were infected with *Plasmodium falciparum* (see STELMA *et al.*, 1993, 1994). Hepatosplenic morbidity at that time was low; only 28 persons (7%), mainly males under 20 years of age, had slight hepatic enlargement (Figure). Only 2 cases of splenic enlargement were observed, both under 5 years old (STELMA *et al.*, 1994). Hepatic and splenic enlargement did not occur combined and affected persons both heavily infected with *S. mansoni* and those only lightly infected (Table). This low level of hepatosplenic involvement had been observed earlier by ultrasound studies in the nearby town of Richard-Toll (ROUQUET *et al.*, 1993).

The prevalence of *S. mansoni* in the 1994 population sample was 89%, and 17% had *P. falciparum* in their thick blood film. The overall prevalence of hepatomegaly had increased to 36%, and 49% of the subjects between 5 and 19 years old had an enlarged left liver lobe (Figure). In this age group the prevalence of splenomegaly had increased from zero in 1991 to 7% (8 of 115) in 1994. Hepatic enlargement occurred in all these 8 subjects, and 75% of the hepatosplenic patients were heavily infected with *S. mansoni* (Table).

Thus, 5 years after the onset of the schistosomiasis epidemic, hepatomegaly started to develop in children and adolescents. However, sonographic studies in 1993 by KARDORFF *et al.* (1996) showed that no serious schistosomiasis specific hepatic fibrosis could yet be detected. Nevertheless, that ultrasound study confirmed the increased number of persons with enlarged livers and spleens; at that time 6–12% of the individuals exhibited hepatomegaly and one-third had splenomegaly (KARDORFF *et al.*, 1996). In Sudan, HOMEIDA *et al.* (1988) demonstrated a time lag of 5 to 10 years between the peak frequency of heavy infections (in adolescents) and the occurrence of liver fibrosis (in young adults). In the recently, but very intensely, infected population of Ndombo, it could thus be expected that severe liver fibrosis would start to appear in untreated individuals 5 to 10 years after the onset of the epidemic—that is, from 1993 and onwards. Fortunately, mass treatment was implemented in the village by the local health services. Hepatic fibrosis was thus infrequent, and such morbidity will hopefully remain rare in the future. It is somewhat surprising, however, that a similar time lag (5 years or more) should exist in the development of liver and spleen enlargement, which is considered to be a (sub)acute inflammatory reaction due to massive accumulation of eggs in the livers of heavily infected children and adolescents (GRYSEELS, 1992; RABELLO, 1995). The low frequency of organomegaly in the early phase of this schistosomiasis epidemic (0–3 years), in spite of the very high egg counts, is indeed puzzling. Apparently, the pathophysiology of organomegaly in *S. mansoni* is still far from being fully understood.

Our observations may also be partly explained by the apparently increased prevalence of *P. falciparum*, in itself a worrying observation. The number of clinical cases of malaria at the hospital level was also reported to have increased drastically since January 1993 (I. Talla, unpublished observation), probably due to heavy rains in 1993 and 1994. During this same period the area of irrigated rice fields was increased, but no increase of the vector population (*Anopheles gambiae*) has been demonstrated so far (FAYE *et al.*, 1993). If indeed malaria prevalence has increased, one would expect an even greater increase of palpable splenomegaly. All patients with splenomegaly in 1994 simultaneously exhibited hepatomegaly (Table). It is therefore most probable that the organomegaly was due to schistosomiasis and not malaria. However, the observed increase of organomegaly in children and adolescents may also be due to the combined increase of both diseases. Therefore serious

**Table. Frequency and percentage of organomegaly in 1991 and 1994 according to intensity of infection**

<i>S. mansoni</i> egg count (eggs/g)	Hepatomegaly		Hepatosplenomegaly		Spleno-megaly	
	1991	1994 <sup>a</sup>	1991	1994 <sup>a</sup>	1991	1994 <sup>a</sup>
0-400	9/153 (6%)	50/163 (31%)	0	2/163 (1%)	1/153 (0.5%)	0
>400	19/245 (8%)	28/80 (35%)	0	6/80 (8%)	1/245 (0.5%)	0

<sup>a</sup>In 1994 the number of subjects examined parasitologically (243) was less than the number (272) included in the clinical survey.

efforts should be undertaken to control both schistosomiasis and malaria in this area, so as to prevent severe pathology developing in the near future.

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