STUDIES ON SCHISTOSOMIASIS (S. MANSONI) IN PORTO RICO

II. PRELIMINARY REPORT ON FINDINGS IN 100 ROUTINE AUTOPSIES

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A cooperative investigation of schistosomiasis was begun about a year ago by the department of parasitology, hygiene and pathology of the School of Tropical Medicine. The first object was to determine the incidence and distribution of the infestation on the Island. While it was expected that epidemiological studies, including the examination of large numbers of fecal specimens for ova and systematic collections of the snails which serve as the intermediate host, would be the most fruitful methods of determining incidence and of locating foci of the disease, it was thought routine post-mortem examinations might supply additional or confirmatory data.* This expectation has been fully realized in that out of the first hundred autopsies performed eleven have shown evidence of existing or recent infection.

A twelfth case was encountered in routine in examination of surgical specimens sent to the laboratory for dissection. An ovary removed by Dr. Pila in Ponce showed a group of adult worms in one of the veins of the broad ligament and the ovary itself contained a number of inflammatory nodules ("tubercles") due to the presence of schistosoma ova.

In only two of the eleven autopsies was the schistosomiasis the direct cause of death. In these an advanced cirrhosis of the liver was the chief lesion found. In the remaining nine the causes of death were various and schistosomiasis was not mentioned in the clinical histories and was not suspected on gross examination of the organs, being revealed only through later routine microscopic study of sections.

* So far as the writer has been able to find out the only reported autopsies on cases of schistosomiasis in Porto Rico, were two done by Dr. González Martínez, member of the Anemia Commission, published in the New Orleans Med. and Surg. Jour., 1916, Vol. 69, and one by Drs. B. Román and Alice Burke, a case of carcinoma of the colon associated with schistosomiasis. (Amer. Jour. Path., Vol. 2, p. 539. 1926.)

The following table gives autopsy number, initials, age, sex and residence of the positive cases:

Autopsy No.	Name	Sex	Age	Residence
5	L. C.	M	16	Caguas
35	N. O. O.	F	82	Fajardo
40	R. M.	M	25	Guayama
42	M. D.	M	45	Guayama
52	M. V.	F	23	Río Piedras
68	B. R.	M	35	Río Grande
73	A. D.	M	18	Fajardo
81	C. M.	M	30	Bayamón
82	F. D.	M	34	Mayagüez
87	M. C.	F	45	Vieques
94	R. R.	M	24	Mayagüez

Sex:

The fact that eight of the eleven positives were males is of no significance since among the cases autopsied there was a large predominance of males, 83 out of a hundred. On the other hand, the mode of infection—penetration of the skin by the larval worm which is found generally in the sluggish water of irrigation ditches —would lead us to expect a higher incidence in men whose work takes them more regularly into the fields. This point will be fully discussed in the epidemiological studies.

Age:

It is noted that the youngest positive case was 16 years old, the oldest 82. Among the 100 autopsies there were sixteen children under fifteen years of whom nine were two years old or under. Since very young children are probably rarely exposed to infection such cases might properly be eliminated in figuring the infestation rate.

Residence:

The epidemiological studies made so far, indicate that schistosomiasis is not endemic in San Juan nor probably Santurce. Our autopsy findings tend to confirm that impression, for although a large majority of the 100 cases autopsied came from the municipality of San Juan, which includes Santurce, all of the eleven positives had lived outside the city, at least up to a short time before the onset of the fatal illness. The distribution of the eleven cases —two in Fajardo at the extreme eastern end of the Island, one in Mayagüez at the western end, two in Guayama in the south, one in Caguas of the central zone, with two from Río Grande and Baya-

món on the north coast and one from the small island of Vieques to the east—is remarkably wide for such a small series, and more noteworthy when it is recalled that the group studied was composed largely of cases from the San Juan district.

Lesions:

The lesions of schistosomiasis are due essentially to the irritation of the eggs of the worm in the tissues and not to the presence of the worm, which lives in the blood vessels of the portal system. The eggs of *S. mansoni* are discharged in the small veins of the large bowel, chiefly those in the submucosa of the rectum. Some are forced into the tissues and thence into the lumen of the gut from which they escape with the feces, producing in their passage, however, a more or less marked colitis. Others are swept into the portal vein and are carried into the liver. The involvement of this organ, according to our study, serves as the best index of the infestation.

Where the infection is mild as it was in nine of our eleven cases, no lesions are recognized grossly though small tubercle-like nodules each representing a foreign body reaction about one or more ova are found on microscopic examination of sections, scattered through the liver, and sometimes in other organs, reached presumably through the general circulation. In one case they were discovered in the pancreas and lung and in another the worms themselves were found in a splenic vessel. When the infection is heavy the fibrous tissue reaction in the liver is abundant, the organ becoming strikingly and characteristically cirrhotic. This was the type of lesion found in autopsies No. 40 and No. 42 where death was directly due to the cirrhosis of the liver, though in one of these cases the chronic colitis was undoubtedly a contributing factor.

The different types or degrees of reaction and the evolution of the lesions will be taken up fully in a subsequent paper.

Summary:

The characteristic lesions produced by the ova of *Schistosoma mansoni* were found in eleven out of one hundred autopsies, or eleven per cent. An additional case was found in the routine examination of surgical specimens, where an ovary was the site of the lesion.

If we exclude children two years old and under, on the ground

of non-exposure, and omit autopsies performed on cases that had lived in known non-endemic areas, such as San Juan, the rate would be more than doubled.

The study shows that schistosomiasis is far more common and more widely distributed in Porto Rico than has heretofore been supposed and indicates that careful autopsy studies may reveal light infections which entirely escape detection during life either because of absence of symptoms or from the scarcity of ova in the feces.