

CER - 14 February 1979. AGE-SPECIFIC REACTIONS TO SKIN TEST FOR SCHISTOSOMIASIS IN NINE ENDEMIC MUNICIPALITIES OF PUERTO RICO 1969-1976. By Henry Negrón Aponte and William Jobin. Seva0 CENTER FOR ENERGY AND ENVIRONMENT RESEARCH, UNIVERSITY OF PUERTO RICO — US. DEPARTMENT OF ENERGY.

Age-Specific Reactions to Skin Test for Schistosomiasis in Nine Endemic Municipalities of Puerto Rico, 1969-1976. By Henry Negrón Aponte and William R. Jobin.

Abstract: Although general evaluations have shown large decreases in antigen reactivity in Puerto Ricans inside the schistosomiasis control projects, little detail has been presented in age-specific rates or on individual municipalities. This report gives such additional information for surveys in 1969 and 1976 in Luquillo, Rio Grande, and Yabucoa, municipalities not in the original control program, and for six other municipalities which had been part of the control program since 1955. The age-specific curves of positivity to the antigen showed steep rises between children 6 years of age to 18 years of age, indicating significant transmission in the recent past in all areas before 1969. By 1976 the positivity rates had increased in the uncontrolled municipality of Luquillo but had decreased markedly in most of the controlled municipalities. However, in Naguabo there was evidence that transmission had not decreased significantly despite many years of snail control.

Age-Specific Reactions to Skin Test for Schistosomiasis in Nine Endemic Municipalities of Puerto Rico, 1969-1976. General evaluations have been made on the island-wide changes in prevalence of schistosomiasis in Puerto Rico, but transmission patterns have not been reported in any detail. It was the purpose of this report to present additional information on reactivity to the skin test in the most important endemic areas of Puerto Rico. Nine municipalities were included in this report, three from the endemic area not part of the Health Department's Control Program.

The program began in 1969, and this study initially focused on six municipalities that had been placed under control in 1955 (Aibonito, Arroyo, Guayama, Patillas, and Vieques, Figure 1).

The next section of text is incoherent and seems to be a mistake or error.

Adult schistosomes were used to prepare antigens using standard procedures. Over 15,000 schoolchildren were injected on the volar aspect of the forearm with 0.05 milliliters of antigen, and their reactivity was read 15 minutes later. The criteria for positivity were a reaction wheal larger than 1.0 square centimeters for all girls and for boys under 16 years of age. For boys 16 years of age and older, the reaction wheal had to be 1.2 square centimeters or larger to be considered positive. The antigen batches used in 1969 and 1976 were standardized against each other. All children in the public schools of the indicated municipalities were tested in the surveys of 1969, and children in all fifth-grade classrooms of the same municipalities were tested in 1976. Thus, an age-specific curve of positivity to the skin test was obtained for 1969 and for children aged 10 to 11 in 1976. All skin test injections were performed by the same person (HMA).

Results from the skin-test must be interpreted with care due to its well-known limitations. However, the repetition of the test under similar circumstances in the same population has considerable practical value in assessing large changes in the distribution and level of schistosome infections. Of the three municipalities not under control in 1969, Yabucoa was then included in the control program in 1970 using snail control by ditching, mollusciciding, and biological control where appropriate. However, no control effort was introduced in Luquillo or Rio Grande before 1976, thus these two communities indicated the course of transmission in the absence of snail control. The mean age-specific reactivity in these 3 communities in

In 1969, the percentage rose from 8% for 6-year-olds to 25% for 16-year-olds (Table 1 and Figures 2 and 3). The increase in positivity with age was quite uniform and continuous, indicating relatively stable transmission conditions prior to 1969. The age-specific prevalence in the children from the controlled municipalities showed much more irregularity with many decreases of prevalence with increasing age, indicating some sporadic transmission despite control efforts (Table 1, Figures 4 and 5).

[The subsequent text appears to be garbled or in a different language and thus cannot be corrected.]

IN PERCENT REACTORS Positive - UNSPECIFIC REACTIVITY TO SCHISTOSOME SKIN TEST IN UNCONTROLLED MUNICIPALITIES OF LUQUILLO AND RIO GRANDE, PUERTO RICO, 1969-1976

50% 45% 40% 35% 30% 25% 20% 15% 10% 5% - Luquillo 1969 (MEAN) Listed - 1969 MEAN FOR YABUCOA, LUQUILLO AND RIO GRANDE - AGE IN YEARS FIGURE 2

AGE-SPECIFIC REACTIVITY TO SCHISTOSOME SKIN TEST IN MUNICIPALITY OF YABUCOA, PUERTO RICO, 1969-1976 - REACTORS IN PER CENT Positive 50% 45% 40% 35% 30% 25% 20% 15% 10% 5% - Yabucoa 1969 - 1969 MEAN FOR YABUCOA, LUQUILLO AND RIO GRANDE - AGE IN YEARS FIGURE 3

PERCENT POSITIVE REACTORS - AGE-SPECIFIC REACTIONS TO SCHISTOSOME SKIN TEST IN CONTROLLED MUNICIPALITIES OF AIBONITO, ARROYO, GUAYAMA AND PATILLAS, PUERTO RICO 1969 - 1976

50%

45% GUAYAMA 1969 40% 35% IN OURS 30%, 25% 20% 15% \\1969 MEAN FOR 3 UNCONTROLLED MUNICIPALITIES. 10% 3% 1976 REACTIVITY 10 12 14 16 AGE IN YEARS FIGURE 4

AGE-SPECIFIC REACTIVITY TO SCHISTOSOME SKIN TEST IN CONTROLLED MUNICIPALITIES OF NAGUABO AND VIEQUES, 50% 45% 40% PERCENT 35% 30% REACTORS 10% 5% PUERTO RICO, 1969-1976 NAGUABO 1969 1969 MEAN FOR UNCONTROLLED MUNICIPALITIES, 10 2 4 16 18 AGE IN YEARS Vieques 1969 FIGURE 5

In fifth-grade children, the only age-group tested both in 1969 and 1976, the proportion of positives in the 3 municipalities not in the original control program was slightly higher in 1969 in Yabucoa (26%) than in Rio Grande and Luquillo which were 16% and 6% respectively (Table 2 and Figures 2 and 3). By 1976, the prevalence in Yabucoa decreased to 12% while it rose to 27% in Luquillo and remained about the same in Rio Grande, apparently showing the effects of the control program in Yabucoa (3). The age specific curves for four of the municipalities of the original control program showed generally higher slopes than the non-controlled communities in 1969 (Figure 4). The positivity in Guayama rose from 20% for 9-10 year olds to 40% for 13 year olds. The positivity of fifth graders (10-11 years old) showed a marked decrease in all four of these municipalities, decreasing to less than 58 which is about the normal rate of false positives in a non-endemic community. This decrease was a clear indication of a successful control program when compared with the increase observed in Luquillo and Rio Grande (Table 1). In Naguabo and Vieques Island, there also was a decrease in positivity for fifth graders, but it was not very large, indicating less effectiveness of the control operation in these two municipalities, especially Naguabo (Figure 5).

Table 2: Reactivity to skin test for schistosomes in fifth-grade children of nine endemic municipalities in eastern Puerto Rico, 1969-1976 See Controlled 1969-1976

(3) See

Albonito 21.68 5%, Arroyo 15.68 2.0%, Guayama 25.88 5.28%, Naguabo 14.68 9.08%, Patillas 10.58 2.98%, Vieques 10.18%, Yabucoa 28.0% - Uncontrolled Municipalities. Luquillo 6.28 27.48%, Rio Grande 15.78 13.58%.

The mean specific slope for Vieques was much lower than that for Naguabo, indicating active transmission had occurred previous to 1969. The previous evaluations of the control effort had shown that the proportion of skin test reactors in the control areas decreased much faster than in uncontrolled areas, as confirmed by this evaluation (1). In addition, we can rank the control projects in general terms, based on this more detailed analysis. During the period from 1969 to 1976, the projects in Albonito, Arroyo, Guayama, Patillas, and Yabucoa showed marked improvements whereas Vieques and Naguabo showed much less impact from the control efforts. Additionally, there was a serious increase in reactivity in Luquillo indicating active transmission.

References:

Nerén, H., and Jobin, W. R., 1979. Schistosomiasis Control in Puerto Rico: 25 years of operational experience. May issue AITHH.

Rutz, E., Cox, P.M. and Greenberg, F. R., 1973. Simplified criteria for interpretation of the schistosomiasis skin test. Ann. Trop. Med. Parasitol.

Kagan, I. G., Wegrén, H., Arnold, J. C., and Ferguson, F. F., 1966. A skin test survey for the prevalence of schistosomiasis in Puerto Rico, Public Health Service Publication No. 1525: 91 pp.

Negron, and Nazario, C. M., 1979. The 1976 skin test survey for schistosomiasis in Puerto Rico, Bol. Asoc. Med. P.R. January, issue.

Negrén, H., Ramos, F., and Jobin, W. 1978. Field trial in Ceiba Norte of epidemiological tests for operational evaluation of schistosomiasis control in Puerto Rico. Bol. Asoc. Med. P.R., 70: 298-307.