The Establishment of Immunity in Bilharziasis as Judged by Age

BY

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This study was carried out to learn whether, in an endemic focus, the frequency of bilharzia was the same or different in the elderly African as compared with a younger individual. In a previous publication Morley-Smith and Gelfand showed that in the highly endemic bilharzial region of Mtoko, where the great majority of African children are infested, the percentage of infants affected with the disease, as determined by the passage of ova of *S. haematobium* in the urine, was surprisingly low. This was attributed to different causes. One was that the infant is not washed in the streams for fear of being drowned or attacked by crocodiles, but in river or well water which may have been standing for some while, and so the risk of infection is much reduced. But this is hardly correct, for many babes are still washed at the water's edge and so it was suggested that the infant has acquired some resistance or passive immunity from the mother.

If this were so it might be expected that the older the person, the more likely is he to overcome the infestation, and by the time he reaches the age of 55 or 60 he should have acquired the necessary powers to cause the disease to die out spontaneously.

The purpose of this paper is to compare the incidence of bilharzia in the young and middle-aged adult with that in the more elderly adult.

METHODS AND PROCEDURE

This study was undertaken in the Mtoko reserve. In all, 1,121 individuals between the ages of five and 79 years were tested consecutively for *S. haematobium*, one specimen of urine being tested microscopically by an African microscopist for the ova. Results are summarised in Table I and Fig. 1.

Both show a fairly rapid decline in the incidence of bilharzia infection from the age of 20 to 40 years. Thereafter the frequency levels itself out between 13 and 20 per cent. and continues at approximately the same level up to 80 years.

Table I

Age Groups	Total Number Examined	*S. haematobium* Present	Specimens Free of *S. haematobium*	Percentage of *S. haematobium* Present in Age Group
5- 9 years	157	116	40	74
10-19 „	306	190	116	62
20-29 „	164	62	102	38
30-39 „	106	21	85	20
40-49 „	199	38	161	19
50-59 „	105	14	91	13
60-69 „	46	9	37	19
70-79 „	38	6	32	16
TOTAL	1,121			

Comments

Assuming that all the individuals in the infected region are exposed to the same extent in the infected zone, there appears to be a steady and fairly rapid decline in the frequency of the disease until the age of 40 years. This would suggest that the infected individual slowly but definitely acquires a resistance to the disease. After this age, however, there still remains a hard core of some 15 per cent. of subjects who continue to pass eggs, and with increasing age no further change takes place in the subjects' ability to build up a greater resistance. That some protective or curative powers are built up by the individual is quite clear, for else one would expect a much higher frequency of the disease in those over 35 or 40 years of age, more especially as these people are exposed to the infection as much as the younger age groups. It would appear, too, that there remains a certain number who just cannot overcome the infection on their own accord.

In a previous publication, Morley-Smith and Gelfand (1958) suggested that an infant is probably born with some tolerance to bilharzia, conferred upon it by a mother who herself either has or suffered from the infection, but after the age of three or four this tolerance is lost and the child may easily become infected so that by the age of 12 or 15 almost all suffer from the disease to a greater or lesser extent.

This present study would seem to support the existence of a resistance acquired by the human body when the infection has been contracted some years before. These immune processes should be the subject of further laboratory research in the hope that a means may be discovered by which the tolerance of an individual can be increased.

REFERENCE

Morley-Smith, F. & Gelfand, M. (1958). *C. Afr. J. Med.*, 4, 287.

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Fig. 1.