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INCIDENCE OF SCHISTOSOMIASIS IN THE URBAN POPULATION OF ACCRA, GHANA

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Abstract. The author examined microscopically the urine of 4,199 people of the urban population of Accra searching for the eggs of *Schistosoma haematobium*; he revealed that it occurred more frequently in men than in women. Maximum incidence falls into the age-group of 11—15 years when the rate is as high as 9.91 % in the male. The incidence of *S. haematobium* eggs in urine is accompanied by haematuria in 86.7 %.

MATERIAL AND METHODS

Samples of urine obtained both from out-patients and hospitalized ones from the surrounding hospitals were being sent to our Medical School laboratory in Accra. Within 18 months more than 8,000 samples from patients of the Accra urban population were examined. These samples were provided with a label bearing personal and clinical data. In the present paper only those out-patient cases have been taken into consideration that were sent to hospital for preventive examination before taking up their jobs; in addition, women from prenatal clinics, surgical cases (accidents, appendectomies), snake-bites and cases requiring a clearing up of infectious etiology (morbilli, pertussis, varicella etc.) were treated. Examination was performed in urine quantities usually higher than 100 ml. A total of 4,199 microscopic tests were conducted to prove the presence of the *Schistosoma haematobium* (Bilharz) eggs.

Statistical similarity and difference were counted by the x^2 test with one freedom degree. The probability of the corresponding test results was looked up in the Scientific Tables, Documents Geigy, Fifth edition, 1956.

RESULTS

It follows from Table 1 that schistosomiasis incidence in males increases up to the age-group of 11—15 years (1.15 %; 6.20 %; 9.9 %). Differences between them, however, are not statistically relevant due to the low number of cases examined in the group, the probability of one freedom degree always being higher than 0.5 %. Nevertheless, if we add up the age-groups of 0—5 and 6—10, we obtain an incidence of 2.6 % which differs statistically ($p < 0.001$) from that in the group of 11—15 years which makes 9.91 %. From the age-group of 16 onwards the incidence decreases (3.17 %;

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1.11 %, and finally 0 %). The difference between the age-groups of 11—15 and 16—20 is statistically relevant ($p < 0.02$), as well as that between 16—20 and 21—30 years ($p < 0.05$). There is no difference within the age-group of 21—30.

Table 1. Incidence according to age

Age-group	0—5	6—10	11—50	16—20	21—30	31—40	over 40
% of incidence in men	1.15	6.20	9.91	3.17	1.11	1.15	0
Statistical relevance of difference		c	g	e	d	no difference	
% of incidence in women	0	0	2.44	1.22	0.53	0.29	0
Total number of examined men	345	120	111	189	452	349	683
Total number of examined women	226	104	82	244	564	343	378

a = probability lower than 0.001.
b = probability between 0.001—0.01.
c = probability between 0.01—0.02.
d = probability between 0.02—0.05.
e = probability between 0.05—0.1.
f = probability between 0.1—0.2.
g = probability between 0.2—0.5.

In women the results were similar, yet the incidence in all age-groups was lower and subsequently they had not been processed according to age. The differences between the age-groups of 0—5 and 6—10, as well as those of 21—30 and 31—40 were statistically irrelevant. Therefore these groups were joined together into one group to facilitate an easier demonstration of schistosomiasis incidence in both sexes (Table 2). At the age of 0—10 no schistosomiasis cases in female population had been identified as compared with 12 cases (= 2.63 %) in men one. The difference is statistically relevant ($p < 0.001$)

Table 2. Incidence according to sex

Age-group	0—10	11—15	16—20	21 and more
% of positive men	2.63	9.91	3.17	0.61
% of positive women	0	2.4	1.22	0.31
Statistical relevance of difference	a	a	f	g

Within the age-group of 16—20 positivity in men was ascertained in 3.17 % as opposed to 1.22 % in women. The difference is statistically irrelevant ($p < 0.1$ and > 0.05). Nor had any statistically relevant difference been found in the age-group over 21 years ($p > 0.2$). If we, however, join the groups of 16—20 and 21 and more, where the difference in the incidence of schistosomiasis as regards sex is statistically irrelevant, into one group over 16 years, we obtain 0.91 % of *Schistosoma haematobium* in men and 0.45 % in women. Thus the difference in incidence becomes statistically relevant ($p < 0.05$).

Among the total of 45 schistosomiases 6 were not accompanied by an increased number of erythrocytes in urine (to 5). 1 case showed erythrocytes between 6—10 in one average microscopic field, 19 cases had erythrocytes ranging from 11—50 and 19 over 50. In urines with only 5 erythrocytes in one microscopic field, eggs of *Schistosoma haematobium* occurred in 0.14 %. In urines containing 6—10 erythrocytes they appeared in 6.25 %. The difference as opposed with the preceding group is statistically irrelevant (p between 0.30 and 0.20). The difference between the group bearing 11—50 erythrocytes and the two preceding ones is statistically relevant. The difference in incidence between the group to 10 and between that over 50 erythrocytes (in one microscopic field) is statistically irrelevant.

DISCUSSION

Incidence according to age: Both Ferreira and Gomez (1959) in Angola and McMullen and Francotte (1962) in the Upper Volta observed that schistosomiasis incidence in infantile age did not differ from that of adult age. On the other hand, Powel (1967) in South Africa, Finc (1969) in Tanganyika, as well as Farooq and Saaman (1967) in Egypt reported that schistosomiasis incidence reached its peak with the age-group of 10—15 years. Our results are consistent with the findings of the latter authors. Even immune reaction from preceding infections can share in the decreased schistosomiasis incidence in later age.

Incidence according to sex: As a rule, a higher incidence occurs in men than in women. Thus Freedman and Elsdon-Dew (1958) in South Africa found 46.8 % in boys and 20.2 % in girls. Okpala (1957) in Lagos (Nigeria) in 6.03 % of men, but only 2.47 % in women. Ellis, Longs and Friedland found the positivity of boys being three times as high as that of girls (on the Niger banks). The results of our investigation correspond to the findings of the majority of authors. The low incidence of schistosomiasis in Accra can be attributed to the fact that the entire city is supplied with non-contaminated water from the municipal water-main which excludes washing in puddles and brooks. The women of the urban population stay more at home, whereas men work generally in the surroundings of the city and some catch freshwater fishes. Mac Cullogh (1955) found that 6 % of the children in Tema (Ghana) suffered from schistosomiasis while in the nearby village of Ashaiman the incidence was 43 %. Microhaematuria: Ferreira and Gomez (1959) pointed out that the patient quite frequently did not show signs of haematuria. Rosanelli (1960) studied haematuria in most adult cases and in all infantile ones. The data from Ghana confirm that the incidence of schistosomiasis is almost every time accompanied by haematuria. All the 7 cases, where the number of erythrocytes was nearly normal, were adult persons and eggs were found only scanty.

НАЛИЧИЕ БИЛЬГАРЦИОЗА В ГОРОДСКОМ НАСЕЛЕНИИ Г. АККРА, ГАНА

В. Боздех

Резюме. Автор микроскопическим методом рассматривал мочу 4.199 лиц из городского населения г. Аккра с целью нахождения лиц кровяного паразита *Schistosoma haematobium;* он нашел, что паразит чаще встречается у мужчин чем у женщин. Самое высокое поражение оказалось в возрастной группе от 11 до 15 лет (9,91 % у мужского пола). Нахождение яиц *S. haematobium* в моче сопровождалось гематурией.

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