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Some social aspects of helminthiasis among the people of Gumau District, Bauchi State, Nigeria

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Summary

A helminthological study of faecal materials collected from 1037 people from four rural communities in Gumau District of Bauchi State, Nigeria was carried out using a standard diagnostic procedure. The study is the first parasitological survey to be carried out in this rural district.

Thirty-nine percent of examined persons were infected with helminths. *Ascaris lumbricoides*, *Schistosoma mansoni*, *Trichuris trichiura*, *Hymenolepis nana*, *Strongyloides stercoralis*, *Taenia sp.* and hookworm were encountered. Mixed infections were very common.

There did not seem to be any difference between these and results obtained half a century ago in similar areas of northern Nigeria. The findings are discussed from the point of view of the social aspects of the people which encourage host–parasite contact and their implications for public health. Suggestions are made for the control of helminth parasites in the district.

Introduction

The epidemiology of human parasites is well studied in urban and semiurban societies. Indeed, hospital records have become an increasingly popular method of determining prevalence of parasites in recent times (Cowper 1967). However, as hospital populations are obviously highly selected, extensive field surveys to locate the foci and determine patterns of transmission of human parasites are very necessary for effective rural health planning and long-term management of these disease agents in the community at large.

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Materials and methods

The study was of four rural communities of the Gumau District of Bauchi State, Nigeria. The selected communities were Gumau, Badiko, Laru and Magama. Gumau is located on 10 5'N of the Equator and 9 5'E. The four villages are located along the Magama–Gumau road of Bauchi State. The mean annual rainfall in the district ranges between 1270 and 1828 mm while the annual temperature ranges between 20 and 30 C (Kowal & Knabe 1972). The villages are largely rural farming communities.

Although the main sources of water vary, the use of surface water seemed most common.

The traditional heads of the villages helped to organize the villagers for effective sampling. Each participant was given a numbered specimen bottle and a sheet of newspaper. The procedure for introducing faecal material into the bottle was explained. Recovery of bottles with faecal samples usually took 24 h. Faecal samples were preserved in formol saline before laboratory observation. Fieldwork took about 3 to 4 days.

The formol–ether concentration method described by King (1973) was used for laboratory examination of faecal material.

Results

Table 1 shows that Badiko had twice the rate of infection as Magama, which had the least. Seven types of helminths were encountered: *Ascaris lumbricoides*, *Schistosoma mansoni*,

Table 1. Distribution of helminth parasites according to village and age

Age years	Gumau		Badiko		Laru		Magama		Total	
	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam.	No. inf.
0–10	151	66 (43.7)	82	46 (56.0)	56	26 (46.4)	74	15 (20.3)	363	153 42.1
11–20	228	86 (37.7)	46	15 (32.6)	71	21 (29.6)	15	4 (26.6)	360	126 35.0
21–30	58	22 (37.9)	41	15 (36.7)	7	7 (100.0)	33	8 (24.2	139	52 37.4
31–40	48	18 (37.5)	18	9 (50.0)	2	1 (50.0)	19	8 (42.1)	87	36 41.4
Above 40	36	16 (44.4)	26	13 (50.0)	12	6 (50.0)	14	3 (21.4)	88	38 43.2
Total	521	208 (39.9)	213	98 (46.0)	148	61 (41.2)	155	38 (24.5)	1037	405 39.0

Table 2. Distribution of each helminth in the District*

Helminth	Gumau No. infected (%)	Badiko No. infected (%)	Laru No. infected (%)	Magama No. infected (%)	Total No. infected (%)
A. lumbricoides	112 (21.5)	51 23.9	41 (27.7	29 (18.7)	233 22.5
S. mansoni	80 (15.4	23 10.8	6 4.0)	3 1.9)	112 10.8
Hookworm	17 3.3)	18 8.5	6 4.0.	5 3.2)	46 4.4
Taenia spp.	6 (1.2)	2 (0.9	2 1.4	5 3.2)	15 1.4
Hymenolepis nana	4 (0.8)	7 3.3	3 2.0)	3 1.9)	17 1.6
T. trichiura	4 (0.8)	3 1.4	9 (6.1)	0 0	16 1.5)
S. stercoralis	4 (0.8)	0 0	0 0	0 0	4 0.4)
No. examined	521	213	148	155	1037

*These figures include mixed infections.

Table 3. Distribution of helminth parasites according to sex

Sex	Gumau		Badiko		Laru		Magama		Total	
	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam.	No. inf. (%)	No. exam	No. inf. (%)
Male	309	119 (38.5)	117	56 (47.9)	98	44 (44.9)	77	18 (23.4)	601	237 39.4)
Female	212	89 (41.9)	96	42 (47.2)	50	17 (34.0)	78	20 (25.6)	436	168 38.5)
Total	521	208 (39.9)	213	98 (46.0)	148	61 (41.2)	155	38 (24.5)	1037	405 39.0

hook-worm, *Hymenolepis nana*, *Trichuris trichiura*, *Taenia spp.* and *Strongyloides stercoralis* (Table 2).

Differences were observed in prevalence of each helminth (chi-square test, $P < 0.01$). *Ascaris* was consistently the most prevalent helminth in every village and in the whole district. There was a statistical difference in the distribution of infection among the age groups (Friedman's two-way Anova by rank, $P < 0.01$).

Distribution of helminthiasis by sex is shown in Table 3. There was no difference in prevalence of infection between males and females (Sign test, $P < 0.05$).

The prevalence of mixed infections is shown in Table 4. Mixed infections were significantly commoner than single infections (chi-square

were as exposed to the infective stages of helminth parasites as their male counterparts: they owned farms, laundered in the river and lived in equally poor conditions as the menfolk.

The high rate of mixed infections in this district does not appear unusual, neither is the number of cases involving quadruple helminths remarkable. Cases involving 10 parasite species in a single person have been recorded elsewhere in Nigeria (Cowper 1967). The explanation for this may be due to the inadequate water supply to these communities. The limited sources of alternative water become contaminated as the rains and wind convey infective helminth stages into them. This increases the contamination of these alternative sources; host–parasite contact then rises and the environment is further contaminated. It has been noted elsewhere that a correlation exists between water demand and mixed infections (Akogun, in preparation). Other possible reasons may be the parasite environment. A condition which is suitable for one helminth species may be suitable for another; an established helminth may through its activities within the host create a suitable environment for the establishment of another helminth. The host's resistance to further invasion with other helminths may be weakened by the activities of one or two already established ones.

The fact that the findings of this survey do not differ appreciably from those obtained elsewhere in 1934 in northern Nigeria is a reflection of the lack of impact of the health care and social welfare system on this district in the past 52 years. A re-examination of social welfare and health care strategies seems necessary so that rural districts are included in management schemes. An integrated approach is suggested. This should include public enlightenment campaigns and general education to replace traditions which promote helminth infections. The provision of drinking water which meets the demands of the population may make an appreciable impact on the present rate of infection in the Gumau district.

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