INTESTINAL PARASITES IN BANTU MENTAL PATIENTS

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While I was Physician Superintendent of the Umgeni Waterfall Institution (U.W.I.), Howick, in 1955, I found that, owing to postal delays, pathological specimens sent to the government laboratory in Durban arrived there in a spoilt condition in a high proportion of cases, while in others the delay made the reports valueless by the time they were received.

I therefore obtained departmental permission to open a small laboratory at the hospital. It was equipped to deal with relatively simple investigations such as blood counts, uncomplicated bacteriological procedures, and urine and stool examinations, and was staffed by a Bantu laboratory attendant who had been given a 3-year course of training at the Wentworth Hospital, Durban. He worked under the supervision of a medical officer.

This not only solved the problem of getting prompt reports, but made the clinical work infinitely more interesting for the medical staff, and even permitted some simple research investigations to be instituted. It is the only laboratory of its kind in the mental hospital service.

One of these investigations was the routine examination of the stools of all the patients admitted to the hospital, for intestinal parasites.

The hospital admits two types of patients: European mental defectives of all ages from infancy upwards, and chronic male Bantu mental patients. The European patients are largely first admissions. The Bantu patients are all transfers from other mental hospitals in various parts of South Africa — they have all received psychiatric treatment in the hospitals where they were first admitted, but,

TABLE I. PARASITES IN PATIENTS FROM VARIOUS HOSPITALS ADMITTED TO UMGENI WATERFALL INSTITUTION (1955-61)

	Town Hill		Fort Napier		Oranje		Weskoppies		Sterkfontein		Valkenberg		Tower		Komani		Total	
Total cases	136		234		200		254		108		20		23		154		1,129	
	+	%	+	%	+	%	+	%	+	%	+	%	+	%	+	%	+	%
Ascaris lumbricoides	35	25·6	76	32·4	31	15·5	61	24·0	48	44·4	4	20·0	5	21·7	28	18·1	288	25·5
Trichuris trichiura	51	37·5	121	51·7	25	12·5	74	29·1	51	47·2	11	55·0	13	56·5	29	18·8	375	33·2
Hookworm	6	4·4	6	2·5	—		—		2	1·8	1	5·0	—		—		15	1·3
Strongyloides stercoralis	5	3·6	9	3·7	5	2·5	3	1·1	2	1·8	1	5·0	1	4·3	3	1·9	29	2·5
Taenia	14	10·1	21	8·9	3	1·5	6	2·2	—		—		—		3	1·9	44	3·8
Hymenolepsis nana	1	·7	1	·4	—		1	·3	—		—		—		—		3	·2
Oxyuris vermicularis	2	1·4	2	·8	3	1·5	—		1	·8	—		—		—		8	·7
Schistosoma mansoni	—		1	·4	—		1	·3	—		—		—		—		2	·1
Entamoeba histolytica	—		—		—		—		—		—		—		—		—	
Entamoeba coli	37	27·2	70	29·9	60	30	75	29·5	43	39·9	7	35·0	10	43	29	18·8	331	29·3
Trichomonas hominis	—		1	·4	1	·5	1	·3	2	1·8	—		—		—		5	·4
Giardia lamblia	—		—		—		—		—		—		—		—		—	
Balantidium coli	1	·7	6	2·5	2	1	2	·7	2	1·8	—		—		1	·6	13	1·1
Iodamoeba buetschlii	2	1·4	—		3	1·5	3	1·1	2	1·8	—		—		1	·6	11	·9

failing to respond within a reasonable time, were transferred to the Umgeni Waterfall Institution in order to make room for new admissions. The duration of their detention before transfer varied. The minimum was about 1 year, while many had been detained for 5 years, 10 years, or even longer.

The stools of all these Bantu patients were examined microscopically within a few days of their arrival at the U.W.I., so that it can be accepted that any parasites discovered had arrived with the patient. Anyone found harbouring pathogenic parasites was given treatment. All patients were re-examined at intervals of one year. Thus, the number of stool examinations each patient had undergone, varied from 1 to 6, depending on the length of his stay at U.W.I.

I recently (1960 - 1961) spent a year at the U.W.I. as a temporary medical officer, and was able to collect the accumulated findings (summarized in Tables I - V) of all the patients examined since 1955. These totalled 1,129. The number of stools examined totalled 2,199.

DISCUSSION

Incidence

The incidence of intestinal parasites in Bantu mental patients may be compared with that found in other surveys in Africa and Europe.

In the present investigation the order of frequency and percentage infested (Table I) was: (1) *Trichuris trichiura* 33·2%, (2) *Entamoeba coli* 29·3%, (3) *Ascaris lumbricoides* 25·5%, and (4) *Taenia* 3·8%.

Briscoe[1] in the Kitui district of Kenya found that among 528 patients admitted to hospital for other conditions in a 12-month period, 357 (67·6%) were infested. The parasites, in order of frequency, were: (1) *Taenia* 163 (30·8%), (2) *Ascaris lumbricoides* 85 (16·0%), (3) *Ankylostoma duodenale* 71 (13·4%), and (4) *Schistosoma mansoni* 17 (3·2%).

There were 240 (45·4%) cases of single infection and 128 (24·2%) cases of multiple infection.

Elsdon-Dew and Horner,[2] in a survey of African factory workers living in barracks in Durban, found that the order was: (1) *Trichuris trichiura* 43·5%, (2) *Entamoeba coli* 40·3%, (3) *Ascaris lumbricoides* 37·1%, (4) *Endolimax nana* 16·9%, and (5) *Taenia* 11·1%.

Heinz,[3] from the Division of Parasitology, Witwatersrand University, in a random sample of 200 taken from the Witwatersrand Native Labour Association Mine Labour group, found 63% negative and 37% positive, the order of frequency being: (1) Hookworm, (2) *Ascaris lumbricoides*, (3) *Trichuris trichiura*, and (4) *Taenia*.

There thus appears to be general agreement as to which parasites occur most frequently, although the order varies somewhat from area to area. On the whole the percentage incidence in mental hospitals is significantly lower than was found in other surveys.

The individual hospital in which conditions compare most closely with the survey by Elsdon-Dew and Horner is Fort Napier, at Pietermaritzburg. In their survey the people examined lived in barracks attached to a factory and had one meal per day supplied to them by the factory. These conditions approximated fairly closely to those in a mental hospital. Furthermore, a high proportion of the Bantu patients at Fort Napier are drawn from Durban and vicinity.

The comparable figures for the most frequently found parasites are:

Parasite	*Durban factory*	*Fort Napier Hospital*
Trichuris	43·5%	51·7%
Entamoeba coli	40·3%	29·9%
Ascaris	37·1%	32·4%
Taenia	11·1%	8·9%
S. stercoralis	6·7%	3·7%

It is striking that the order of frequency of the 5 most common parasites is identical. Except for *Trichuris*, Fort Napier's figures are all lower, and, as will be shown later, Fort Napier is among the 2 most heavily infested hospitals.

Investigations into the incidence of particular parasites have also been reported.

Osburn[4] investigated the incidence of strongyloidiasis in Natal and found that among 199 Natives 30 (14·9%) were positive. He quotes Park Ross, who in 1908 found 820 positive cases among 1,587 Indians (51·6%) and 11 positive cases among 71 Natives (15·4%).

He described it as rare in Johannesburg and Port Elizabeth. In Johannesburg the South African Institute for Medical Research found only 7 cases in a period of 4 years, while in Port Elizabeth not a single case was discovered in 1,300 stool examinations.

Brink *et al.*[5] tested 26,355 stools for *Schistosoma mansoni* in Bantu children in the Northern Transvaal, and found 6,377 (24·2%) positive.

Lehmensick,[6] writing on the incidence of *Ascaris lumbricoides* in Europe, quotes Schlieper and Kalies who

found between 22 and 41% of the population in various parts of Germany infested. In Switzerland, he says, Matossi found 18% positive in the city of Zurich and up to 48% in the surrounding countryside. In some peasant populations in the Canton of Tessin 77% were found to be infested.

If we compare these figures with those in Table I, showing the incidence in individual mental hospitals, we find that this incidence on the whole compares favourably with those found in other parts of South Africa, and even in Europe.

Weight of Infestation (Table II)

The figures for all our hospitals and Elsdon-Dew and Horner's survey are:

	Mental hospitals		*Durban factory*	
	No.	%	*No.*	%
Negative	432	38·2	92	16·9
Positive (one species in stool)	362	32·0	221	40·4
Positive (multiple species)	335	29·8	234	42·7
Total	1,129	100	547	100

Number of Species per Patient (Table III)

The average for all patients admitted to the U.W.I was almost exactly 1 (·99) as compared with 1·53 in Elsdon-Dew and Horner's survey.

Other points that are striking in comparing the findings in Table I with Elsdon-Dew and Horner's survey, are: (*a*) The significantly lower incidence of *Ascaris lumbricoides* (round worm) in the mental patients from all the hospitals, and (*b*) the complete absence of any *Entamoeba histolytica* infection (amoebic dysentery). The explanation is fairly clear. All hospitals readily spot these 2 types and treat them actively.

The Individual Hospitals

The weight of infestation (Table II) was highest at Sterkfontein and Fort Napier hospitals and lowest at

TABLE II. SINGLE AND MULTIPLE INFESTATION

Hospital	*No. of cases*	*Single*	*Multiple*	*Total*	% *positive*
Komani	154	58	24	82	53·2
Tower	23	6	10	16	69·5
Valkenberg ..	20	7	7	14	70
Sterkfontein ..	108	28	52	80	74
Weskoppies ..	254	70	72	142	55·9
Oranje	200	67	27	94	47
Fort Napier ..	234	72	101	173	73·9
Town Hill	136	54	42	96	70·5
Total	1,129	362	335	697	61·7

Oranje and Komani hospitals. The number of species per patient (Table III) was, likewise, highest at Sterkfontein and Fort Napier hospitals, and lowest at Komani and Oranje hospitals. The average number of species per examination (Table IV) was highest at Fort Napier and Sterkfontein and lowest at Komani and Oranje hospitals.

TABLE III. NUMBER OF SPECIES PER PATIENT

Hospital	*No. of patients*	*Number of parasites at first examination*	*Average*
Komani	154	94	·61
Tower	23	29	1·2
Valkenberg	20	24	1·2
Sterkfontein	108	153	1·4
Weskoppies	254	227	·89
Oranje	200	133	·66
Fort Napier	234	314	1·3
Town Hill	136	154	1·1
Total	1,129	1,128	·99

TABLE IV. TOTAL NUMBER OF SPECIES IN ALL EXAMINATIONS

Hospital	*Total number of parasites*	*Total examinations*	*Number of parasites per examination*
Komani	192	263	·72
Tower	63	46	1·3
Valkenberg	39	36	1·0
Sterkfontein	292	213	1·3
Weskoppies	539	509	1·0
Oranje	326	345	·94
Fort Napier	735	520	1·4
Town Hill	329	267	1·2
Total	2,515	2,199	1·1

Results of Transfer (Table V)

Table V gives an indication of the subsequent history of the patients admitted to the Umgeni Waterfall Insti-

TABLE V. FINDINGS AT U.W.I.

Positive on admission and positive later ..	593	
Positive on admission and negative later ..	104	
Total positive	—	697
Negative on admission and negative later ..	119	
Negative on admission and positive later ..	210	
Negative on admission (only 1 examination) ..	103	
Total negative	—	432
Total		1,129

tution. Of the 1,129 patients examined on admission, 697 (61·7%) were positive for parasites. Of these, 104 (9·2%) became negative after treatment and remained negative at all further examinations, while 593 (52·5%) remained positive in spite of treatment. Of 432 (38·3%) patients who were negative on admission, 210 (18·6%) became positive at some time later on, 103 were only examined on one occasion because they were the most recent admissions, and 119 (10·5%) remained negative at all subsequent examinations.

SUMMARY

1,129 Bantu male mental patients were transferred to the Umgeni Waterfall Institution, Howick, during 1955 - 61. They had stool examinations for parasites on admission and subsequently at annual intervals. Of these, 697 were found to be harbouring one or more species of intestinal parasites on admission.

The incidence (61·7%) compared favourably with that found in a group of Bantu in a Durban factory where it was 83·1%. The weight of infestation and the number of species per patient were also significantly lower in the

mental hospital patients. The incidence of individual species of parasites likewise compares favourably with findings in Africa and Europe.

The individual hospitals showed considerable variations. The most severely infested hospitals appear to be Sterkfontein and Fort Napier, while the least severely infested are Komani and Oranje. The others fall somewhere in between. The first two draw the bulk of their patients from congested urban areas, while the last two draw theirs largely from rural areas. Could this explain the differences found?

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