SOME BLOOD CHANGES IN
ANKYLOSTOMIASIS.By A. HOCART BREHAUT, B.A., M.D., B.C. CANTAB.,
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THAT the anæmia in cases of ankylostomiasis is due to the presence of a toxin is now generally acknowledged, and it appears probable that the eosinophilia is, in a way, a measure of the amount of toxins circulating in the blood—the function of the eosinophiles is probably the formation of an antitoxin. While in Egypt I made a number of differential counts on adult natives who were suffering from the disease, and as the results, especially as regards the eosinophiles, differ from the European ones, appended is a list of 40

which may be of interest. In the accompanying list 300, 400, or 500 leucocytes were counted.

An analysis of these counts shows that the average percentage of the eosinophiles is small compared to the European percentages, and also that there are none of those high eosinophilic counts which have so frequently been described. The average percentage is only 10 per cent. and the highest individual count is 36·75 per cent. Is there any possible explanation of this? Most of, if not all, the poorer Egyptians suffer from old-standing bilharziosis and this is known to be associated with an eosinophilia. It appears possible, and in fact probable, that they are in a state of tolerance to toxins of a certain nature; and consequently in case of an increase in the amount of toxins circulating in the blood the reaction—i.e., the eosinophilic change—would not be so great as in those who had never suffered from a previous toxæmia of a similar nature.

Guernsey.

Number.	Red blood corpuscles per cubic millimetre.	White blood corpuscles per cubic millimetre.	Hæmoglobin.	Colour index.	Poly-morpho-nuclear leucocytes.	Large hyaline.	Lymphocytes.	Eosinophiles.	Myelocytes.	Mast cells.
1	3,208,000	5,600	45	0·7	83·00	5	7	5	—	—
2	2,300,000	28,125	32	0·69	38·75	7·5	15·5	36·75	—	0·75
3	2,200,000	9,200	24	0·545	74·4	2·8	17·2	4	0·4	1·0
4	3,755,200	12,600	48	0·64	63·6	2	26	8	—	—
5	892,000	9,208	About 8	0·44	81·5	2·5	13·5	2·5	—	—
6	1,025,000	10,200	9	0·45	67·25	2·25	10·25	14	6	—
7	2,020,000	12,200	20	0·5	68·75	4	22·25	8	—	0·25
8	2,468,000	12,600	30	0·62	68·4	3·4	17·6	10	0·2	0·4
9	1,700,000	12,187	12	0·35	67·5	4·5	15·4	10·5	1·6	0·6
10	2,345,000	12,187	29	0·62	71·2	4	12·8	10·1	0·3	0·7
11	3,175,000	8,400	40	0·64	59·6	3·6	24	12·4	0·2	0·2
12	2,844,000	17,600	31	0·62	77·2	6·4	10·8	2	—	—
13	1,597,500	6,289	15	0·5	71·4	3·6	17·6	8	0·4	—
14	1,252,000	18,280	12	0·5	60·5	5	23·5	15·0	0·5	0·5
15	1,226,000	9,200	14	0·58	66·4	4	20	8·4	0·4	0·8
16	1,860,000	11,000	20	0·55	60·4	4·4	23·6	8·6	1	1
17	1,570,000	10,000	16	0·53	58·75	4·25	23·25	10·5	0·25	0·5
18	4,490,000	10,625	88	0·99	55·75	1·75	27·5	13·75	0·5	0·75
19	1,551,200	10,800	15	0·5	61·00	6·2	21	11·4	—	0·4
20	2,080,000	9,000	22	0·55	79·6	3·6	14·00	2·4	—	0·4
21	2,400,000	8,125	30	0·62	72	6·5	16·0	3·5	—	0·5
22	1,625,000	10,525	20	0·62	60·5	4·5	25	10	—	—
23	1,638,000	19,200	14	0·43	62	6	19·2	10·8	1	1
24	2,160,000	10,600	20	0·46	66	3·2	12·8	16	—	2·0
25	2,025,000	10,000	23	0·57	68·75	3·25	21·5	6·5	—	—
26	2,960,000	13,200	33	0·57	44·8	8	29·6	16·8	—	0·8
27	4,792,000	10,200	86	0·90	67·4	3	19·4	8·4	0·8	—
28	4,250,000	9,200	65	0·77	60·5	2	27·5	9·5	—	0·5
29	2,038,000	12,800	17	0·42	66·5	2·5	18·5	12	0·5	—
30	3,950,000	6,000	54	0·69	61	4·6	19	13·8	—	1·6
31	1,500,000	10,200	16	0·53	60·5	4	21·25	12·25	—	0·5
32	1,512,000	11,200	15	0·50	72·8	4·4	16	6·8	—	—
33	3,883,300	10,600	55	0·72	65	4	22	8	0·5	0·5
34	2,600,000	8,000	25	0·57	70	7	12	10·5	—	0·5
35	1,062,160	20,600	10	0·50	75	3·6	18·2	2·8	—	0·4
36	2,360,000	10,800	19	0·40	60·8	5·6	26	6·8	—	0·8
37	1,962,000	19,062	22	0·57	76·5	2·5	17	2·5	—	1·5
38	2,260,000	7,000	27	0·61	65·2	4	14	15·4	0·4	1·0
39	2,692,600	13,000	27	0·50	60	7·6	18	12	1	1·2
40	3,155,200	10,000	44	0·70	66	2·6	16	14·4	1·0	—
Total ...	94,383,860	465,613	1152	23·165	2646·2	169·6	751·7	400·05	16·95	20·05
Average...	2,359,596	11,640	28·8	0·59	66·15	4·24	18·79	10·00	0·42	0·50

1. Only seven ankylostoma worms were present. 2. This was the highest eosinophile count found. There was also a large increase in the leucocyte count. 3. Unusually large number of small nucleated red cells were present. 4. 0·4 transitional. Many nucleated red cells were seen. 5. It was impossible to estimate accurately the hæmoglobin as it was so small. Extreme variation in size and shape of red cells. Very numerous blood platelets. Fatal case. 6. Fatal case. There was marked variation in size and shape of red cells. Platelets very abundant. 10. 0·9 transitional. 12. A large number of platelets present. Patient had pellagra and recent and old bilharziosis. 13. Many nucleated red cells present. Much alteration in size of the non-nucleated red cells. 15. Marked tendency to degeneration in the leucocytes. 16. 1 per cent. transitional. 17. Six transitional cells were counted in 400. 18. A mild case. 12 worms only; no bilharzia present. 19. One transitional cell seen. 21. Two transitional cells in 400. 27. 1 per cent. transitional. 31. 1·5 transitional. 35. There was marked œdema present. Much alteration in size and shape of red cells. Platelets abundant. Fatal case. 39. 0·4 transitional.