

Local Eosinophilia in thick Drops around Microfilaria of *W. bancrofti*

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A. Introduction

In a recently published paper E. H. Maier (1949) has reported on the visual impression of an accumulation of eosinophile leucocytes around microfilariae when examining thick drops containing the larvae of *Loa loa* and *Filaria perstans*.

The presence of eosinophilia is a helpful guide in helminthic infections and is taken as being a response of the living body to excreted products of metabolism (toxins) of the worms. It has as yet not been decided, whether adults only or larvae, too, may excrete these products. In this connection E. H. Maier's findings may lead to accept the ability of *Microfilaria loa* and *perstans* either to attract eosinophile leucocytes or to excrete a product which may endow to neutrophile leucocytes the property of taking an eosinophilic character. He reports 86 cases, in 75 of them (87%) he was able to state this local eosinophilia.

Microfilaria loa shows a diurnal periodicity, and has a sheath, whereas *Microfilaria perstans* has no periodicity and is without sheath. It seemed to be of interest to ascertain, whether these results obtained in West Africa with *Microfilaria loa* and *perstans* would apply in another tropical country with another species of microfilaria. *Microfilaria bancrofti*, the main type of filarial infection in the urban parts of Ceylon shows a night periodicity and is sheathed.

B. Writers' investigations

Blood from patients suffering from a filarial infection was taken and spread on slides to thick drops or usual size. The slides were allowed to stand undisturbed until the smears were completely dry. The next day the preparations were haemolysed and stained with Leishman's stain.

When the writer was examining these slides a similar impression of an accumulation of eosinophile leucocytes around microfilariae was not seen. It seemed rather that the movements of the dying microfilaria had wiped off the cells around it. In spite of this first impression a counting of eosinophile and non-eosinophile leucocytes was done around each microfilaria present in the thick drops. The theoretical principles of this differential count are a counting of all cells in three

areas, namely : the first being the circle containing the microfilaria, and of diameter of one microscopic field ; the second is the annular area between the first circle and a circle of diameter of 3 microscopic fields ; and third, the annular area between circle number 2 and another circle of diameter of 5 microscopic fields. (Fig. 1).

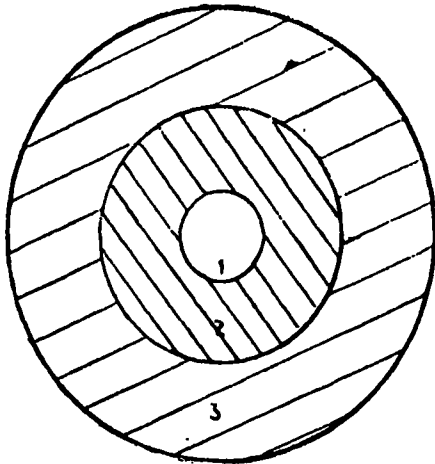


Figure 1

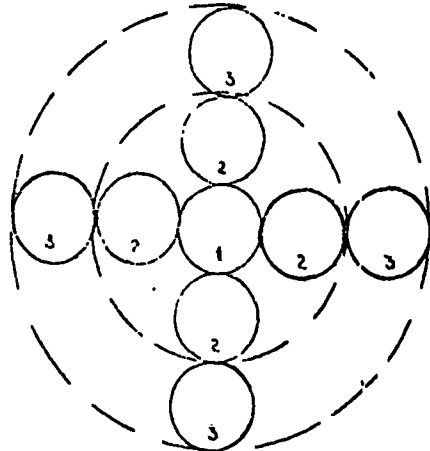


Figure 2

- 1, circle diameter 1 microscopic field, with the microfilaria in the centre
- 2, annular area of breadth of 1 microscopic field
- 3, annular area of breadth of 1 microscopic field.

As it is rather difficult to have annular areas counted as in figure 1, the method was simplified, and the centre and 4 fields only of each of the surrounding annuli 2 and 3 were counted. (Fig. 2).

The total leucocytes and the eosinophile leucocytes were counted separately in each field of the 3 areas, and for all microfilariae present in the smear. The results as percentage of of eosinophiles are given in table I.

TABLE I

Percentage of Eosinophiles				Percentage of Eosinophiles			
No.	1	2	3	No.	1	2	3
1	15.3	13.8	14.6	27	7.7	18.6	18.2
2	15.9	11.8	9.5	28	14.3	9.2	9.3
3	17.0	9.0	7.8	29	12.6	14.8	19.0
4	17.7	8.2	11.5	30	24.6	33.5	39.1
5	6.7	7.0	6.5	31	28.6	19.7	23.5
6	23.8	15.8	17.3	32	33.3	17.9	8.0
7	12.1	4.6	7.1	33	19.1	9.7	9.8
8	18.5	9.1	11.8	34	9.1	6.4	18.9
9	17.4	12.2	11.0	35	25.6	13.5	16.8
10	16.1	10.1	10.8	36	28.5	14.1	11.1

11	31.4	18.5	23.2	+	37	47.2	14.9	13.3	+
12	19.7	13.4	14.9	+	38	24.1	10.6	12.4	+
13	31.5	12.7	19.6	+	39	34.4	15.4	12.8	+
14	35.2	24.2	17.6	+	40	41.2	8.1	7.0	+
15	19.4	23.5	18.8	-	41	24.3	17.0	15.1	+
16	26.3	25.0	20.8	+	42	56.6	22.6	19.0	+
17	22.7	35.4	37.2	-	43	23.8	16.0	14.3	+
18	17.4	10.6	17.4	+	44	45.5	22.0	24.5	+
19	19.0	17.4	17.2	+	45	23.0	16.2	15.2	+
20	43.5	17.8	33.0	+	46	10.2	16.5	14.3	-
21	9.6	17.0	12.1	-	47	35.1	17.6	23.1	+
22	12.5	14.0	11.2	-	48	11.2	16.7	14.3	-
23	23.0	13.5	7.8	+	49	28.1	16.9	17.5	+
24	28.3	22.0	22.4	+	50	41.6	21.1	18.8	+
25	23.5	11.7	10.1	+	51	23.6	12.2	12.2	+
26	25.7	7.9	8.2	+	52	36.0	11.8	13.4	+

Out of a total of 52 cases, 42 cases (81%) showed a clear local eosinophilia around the microfilariae.

In 25 cases a higher percentage of eosinophile leucocytes was found in area 3 compared with area 2. (Table II).

TABLE II

Percentage of Eosinophiles				Percentage of Eosinophiles			
No.	1	2	3	No.	1	2	3
1	15.3	13.8	14.6	24	28.3	22.0	22.4
4	17.7	8.2	11.5	26	25.7	7.9	8.2
6	23.8	15.8	17.3	28	14.3	9.2	9.3
7	12.1	4.6	7.6	31	28.6	19.7	23.5
8	18.5	9.1	11.8	33	19.1	9.7	9.8
10	16.1	10.1	10.8	34	9.1	6.4	18.9
11	31.4	18.5	23.5	35	25.6	13.5	16.8
12	19.7	13.4	14.9	38	24.1	10.6	12.4
13	31.5	12.7	19.6	44	45.5	22.0	24.5
18	17.4	10.6	17.4	47	35.1	17.6	23.1
19	19.0	11.4	17.2	49	28.1	16.9	17.5
20	43.5	17.8	33.0	51	23.6	12.2	12.2
			52.	36.0	11.8	13.2	

C. Conclusions

E. H. Maier's observation of a local eosinophilia around *Microfilaria loa* and persists in thick drops was confirmed with another species of microfilaria, i.e. *W. bancrofti*.

An explanation for this phenomenon may be given that

- (a) the microfilaria attracts eosinophile leucocytes or
- (b) the microfilaria excretes a hypothetical substance, able to induce eosinophilic morphology to neutrophile leucocytes in vitro.

Due to the fact that in 25 cases (60% of the positive cases) a higher percentage of eosinophiles was found in area 3 compared with area 2, it may be assumed that it is an attracting effect of the microfilaria which causes the local eosinophilia. This attraction was sufficient to have eosinophiles passing from area 2 to 1, but was too weak to attract eosinophile cells from area 3 to 2. The assumption of a hypothetical eosinophilia-inducing substance diffusing in the bloodfilm radially is untenable since a higher percentage of eosinophiles is found in area 3, compared with area 2.

D. Summary

A local eosinophilia around the microfilaria of *W. bancrofti* in thick drops is reported.

References

E. H. MAIER, *Zisch. Tropenmed. and Paras.*, 1949, Bd. I, H. 3, 416.