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Short Report

Marked decrease in *Loa loa* microfilaraemia six and twelve months after a single dose of ivermectin

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Cases of encephalopathy have been recorded from Cameroon after ivermectin treatment for onchocerciasis in patients with very high coincident *Loa loa* microfilaraemia (BOUSSINESQ *et al.*, in press). The threshold above which individuals are at risk of developing encephalopathy was estimated to be a microfilarial load of 30000 microfilariae (mf) per mL of blood (CHIPPAUX *et al.*, 1996). Specific monitoring strategies thus need to be developed when mass treatment with ivermectin for onchocerciasis control is implemented in areas where loiasis is co-endemic. As such procedures complicate the distribution of ivermectin, it is important to know whether they should be maintained during subsequent distributions, which are usually organized at annual intervals. The long-term effect of the standard dose of ivermectin (150 μg/kg) on the *L. loa* microfilaraemia of subjects with a very high initial microfilarial count has never been documented. This study aimed to assess whether patients with very high *L. loa* counts before their first dose of ivermectin were still at risk of developing encephalopathy when re-treated 6 or 12 months later.

The study took place in 2 districts, Elig-Mfomo and Sa'a (Lékié Division, Central Province of Cameroon). Capillary blood films (50 μL) were taken between 10:00 and 16:00 from 5500 adults (aged ≥15 years), who then received their first dose of ivermectin (150 μg/kg). After Giemsa-staining, the *L. loa* mf in the blood films were counted. Within each district, the populations were divided into 7 strata according to their microfilarial counts per mL of blood: 0, 1–100, 101–500, 501–2000, 2001–10000, 10001–30000 and >30000. Six months after dosing, 420 treated persons from Elig-Mfomo were selected for a second examination. The sampling was random within each stratum of microfilaraemia, 60 individuals being drawn from each stratum. Of the 420 persons selected, 255 agreed to be re-examined, including 35 with a pre-treatment count >30000 mf/mL. One year after dosing, an identical sampling procedure was applied to the treated population of Sa'a; of the 420 persons selected, 278 provided a second blood film, including 33 with an initial count >30000. The reduction in microfilaraemia within each stratum was calculated from the arithmetic mean microfilarial loads, not the geometric means because the latter give a disproportionate weight to zero and very low values and were thus considered inappropriate in the context of the present study which focused on high individual counts.

Before treatment, the prevalence of *L. loa* microfilaraemia and the average count (including zero counts) in the total populations examined were higher in Elig-Mfomo (32·9% and 3758 mf/mL, respectively) than in Sa'a (28·4% and 2876 mf/mL). The distribution of followed-up subjects according to their pre-treatment and post-treatment counts is given in the Table. Six months after treatment, the average microfilarial counts were reduced by more than 73% in all strata and no mf was found in 63 of the subjects who were microfilaraemic before treatment (one of them having initially harboured 5260 mf/mL). Amongst the 35 subjects who had microfilarial counts >30000 before treatment, only 2 had counts above this level 6 months after dosing; their counts were 141760 and 83780 mf/mL initially, and 71940 and 32280 mf/mL 6 months after treatment. One year after treatment, the microfilarial count was zero in 79 of the subjects who were initially microfilaraemic, including 5 who had >10000 mf/mL before treatment; the reductions in all strata (except that of 101–500 mf/mL) were ≥74%. Amongst the 33 subjects with pre-treatment counts >30000, only one had a count above this level one year after dosing (74140 mf/mL before, and 34540 mf/mL one year after, treatment).

This study showed that a first single dose of ivermectin may bring about a striking reduction in *L. loa* microfilaraemia lasting for at least a year. The pre-treatment examination of 5550 persons allowed us to evaluate the effect of a first dose of ivermectin at 150 μg/kg on 68 individuals who harboured >30000 mf/mL. Only 3 of them had counts above this dangerous level at the sec-

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Table. Distribution of *Loa loa* microfilarial counts six months (Elig-Mfomo) and one year (Sa'a) after ivermectin treatment in relation to pre-treatment counts

District	Microfilarial counts (per mL) Post-treatment[a]							Reduction
Pre-treatment	0	1–100	101–500	501–2000	2001–10000	10001–30000	>30000	(%)[b]
Elig-Mfomo								
0	38	1	0	0	0	0	0	–
1–100	38	5	0	0	0	0	0	86·5
101–500	13	12	7	0	0	0	0	79·4
501–2000	11	6	12	4	0	0	0	75·2
2001–10000	1	2	7	16	12	0	0	73·5
10001–30000	0	1	1	6	23	4	0	73·7
>30000[c]	0	0	0	2	20	11	2	84·4
Sa'a								
0	50	1	0	0	0	0	0	–
1–100	34	6	1	0	0	0	0	74·0
101–500	23	10	3	4	0	0	0	42·9
501–2000	8	4	7	0	0	0	0	91·1
2001–10000	9	5	7	20	4	0	0	79·5
10001–30000	5	1	5	8	27	3	0	82·9
>30000[c]	0	0	2	2	13	15	1	84·7

[a]Numbers of subjects with microfilaraemia in the range shown 6 or 12 months after treatment.
[b]Reduction in mean microfilarial count.
[c]Maximum pre-treatment individual microfilarial counts in the followed-up patients from Elig-Mfomo and Sa'a were 167500 and 198660 per mL, respectively.

ond examination, and one may thus assume that the individual risk of developing a serious neurological reaction related to *L. loa* infection would be reduced by over 90%, but not completely eliminated, if a second ivermectin treatment were given 6–12 months after the first. In the context of mass treatment for onchocerciasis control, any decision to reduce the monitoring strategy in areas co-endemic for loiasis on the occasion of a second annual distribution must depend largely on the coverage achieved during the first treatment round.

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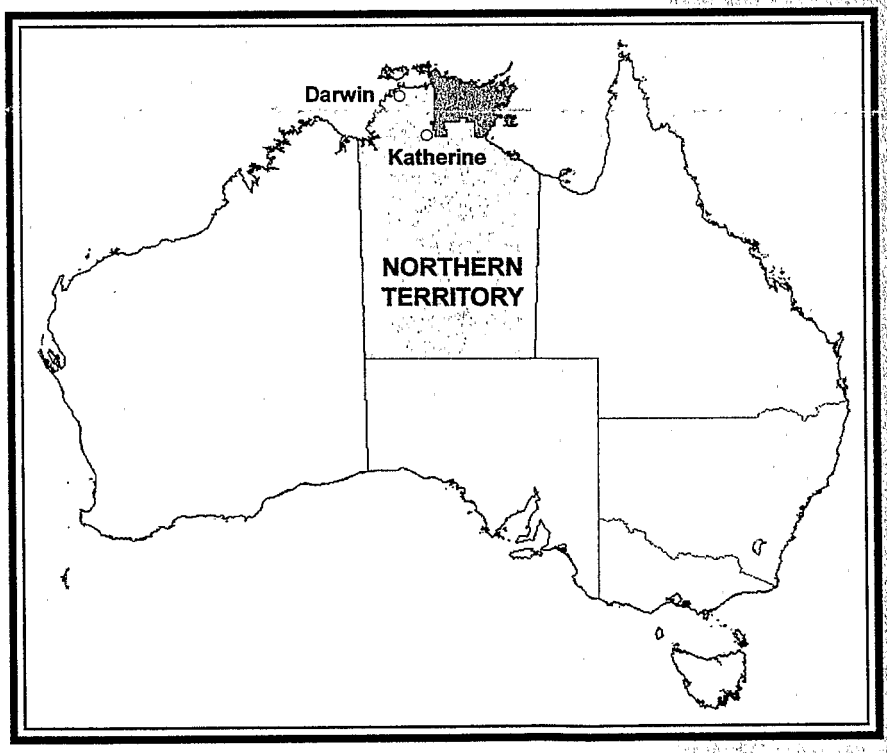

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