TEN YEARS OF MALARIAL THERAPY

BY

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The malarial treatment of male neurosyphilitics was begun here in 1923. The first year's results were recorded by Dr. T. W. Davidson, and a review of the first three years was published by Dr. J. P. Steel and one of us (J. E. N.). A summary of the whole ten years is given below, the findings as far as convenient being expressed in tabular form, so that only a few remarks are necessary.

The cases under care numbered 368, of which 330 were general paretics and tabo-paretics, the remainder being tabetics and meningo-vascular syphilitics. Except in Table I, no distinction has been made between these two classes, for not only did general paralysis account for the vast majority of the cases, but to distinguish between certain atypical forms of general paralysis and other kinds of neurosyphilis is often very difficult. Many of the cases were admitted in a late stage of the disease; a third were bed-ridden on admission, and nearly two-

thirds were wet and dirty in their habits. A third of the patients were over 50 years of age, twelve being over 60.

TREATMENT

Nearly all the patients were given courses of mercury, iodides, and—if inoculated with malaria—tonics, cod-liver oil and malt, and cardiac stimulants during rigors. The number of patients inoculated with malaria was 263, but eighteen of these did not develop the disease, either because they were immune, or there was intercurrent disease and death, or a sudden lowering of vitality necessitated the administration of quinine before the onset of rigors. Of the 245 who had a first attack of malaria, sixty-one were inoculated for a second, but only in forty-nine cases was success achieved. Indeed, seventy inoculations were required to produce these forty-nine second attacks. A third attack was induced—but again with difficulty—in nine patients, while nine others proved refractory. The total number of inoculations was 397, of which 277 were intramuscular, thirty-eight intravenous, forty-one subcutaneous, and forty-one by mosquito, these last being especially useful in overcoming the resistance offered to the production of a second attack.

In the first attack 100 patients had seven to nine rigors, eighty-six had less than seven, and fifty-nine had more than nine, four rigors being the minimum likely to lead

TABLE I.—Summary

*	All cases			Died			Discharged			Transferred			Remaining		
	G.P.I.	Others	Total	G.P.I.	Others	Total	G.P.I.	Others	Total	G.P.I.	Others	Total	G.P.I.	Others	Total
Total admitted ...	330	38	368	209	15	224	60	9	69	8	3	11	53	11	64
Inoculated ...	243	20	263	125	4	129	60	7	67	7	2	9	51	7	58
No malaria ...	17	1	18	16	1	17	—	—	—	1	—	1	—	—	—
Malaria ...	226	19	245	109	3	112	60	7	67	6	2	8	51	7	58
Total "no malaria" ...	104	19	123	100	12	112	—	2	2	2	1	3	2	4	6

TABLE II.—Results in Malarial and Non-malarial Cases

		All Cases	Age Groups					Length of Stay in the Hospital in Years												Number of Malarial Attacks			Number of Rigors in First Attack						Tryparsamide and Other Additional Treatments				Bed-ridden on Admission
			Under 30	30-40	40-50	50-60	Over 60	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	1	2	3	1-3	4-6	7-9	10-12	Mal.	Mal. + Tryp.	Mal. + Others	Mal. + Tryp. + Others				
Total cases	Malaria ...	245	9	66	103	52	10	114	57	23	18	4	8	6	5	2	3	5	196	40	9	22	64	100	59	165	8	37	35	56			
	No malaria ...	123	7	23	46	45	2	104	12	4	1	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	64			
	Total ..	368	16	89	154	97	12	218	69	27	19	4	8	6	6	2	3	6	196	40	9	22	64	100	59	165	8	37	35	120			
Died ...	Malaria ...	112	1	25	47	34	4	66	15	12	10	2	3	2	1	—	—	1	93	17	2	16	42	37	17	102	2	7	1	42			
	No malaria ...	112	6	20	43	42	1	97	11	2	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	63			
	Total ...	224	7	45	90	76	5	163	26	14	11	2	3	2	2	—	—	1	93	17	2	16	42	37	17	102	2	7	1	105			
Discharged	Malaria ...	67	3	18	33	9	4	32	25	4	4	—	1	1	—	—	—	—	60	7	—	2	12	34	19	45	1	12	9	6			
	No malaria ...	2	—	1	1	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
	Total ...	69	3	19	34	9	4	34	25	4	4	—	1	1	—	—	—	—	60	7	—	2	12	34	19	45	1	12	9	6			
Transferred	Malaria ...	8	—	4	2	2	—	4	2	—	2	—	—	—	—	—	—	—	7	—	1	1	2	3	2	6	—	2	—	—			
	No malaria ...	3	—	2	—	—	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
	Total ...	11	—	6	2	2	1	7	2	—	2	—	—	—	—	—	—	—	7	—	1	1	2	3	2	6	—	2	—	—			
Remaining...	Malaria ...	58	5	18	26	7	2	12	15	7	2	2	4	3	4	2	3	4	36	16	6	3	8	26	21	12	5	16	25	8			
	No malaria ...	6	1	—	2	3	—	2	1	2	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1			
	Total ...	64	6	18	28	10	2	14	16	9	2	2	4	3	4	2	3	5	36	16	6	3	8	26	21	12	5	16	25	9			

TABLE III.—Percentage of Cases showing Positive Results

	Before Malaria	Years after Malaria										
		0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11
Number of cases ...	330	116	71	40	32	20	16	18	10	11	3	1
Spinal fluid:												
Cells increased ...	92.0	43.3	42.3	30.0	21.9	15.0	6.3	5.6	10.0	9.1	Too few for percentages	Too few for percentages
Globulin positive ...	96.0	75.9	53.5	62.5	68.8	60.0	43.7	33.3	10.0	9.1		
Lange reaching up to 5 or 4 ...	92.9	79.3	67.6	50.0	31.2	30.0	12.5	0	0	0		
" " " 3 or 2 ...	6.0	18.1	26.8	42.5	62.5	50.0	56.3	50.0	30.0	27.3		
" " " 1 or 0 ...	1.1	2.6	5.6	7.5	6.3	20.0	31.2	50.0	70.0	72.7		
Wassermann positive ...	97.5	91.7	85.0	94.1	50.0	50.0	20.0	11.3	37.5	18.2		
Flocculation tests positive ...	97.5	96.7	90.0	94.1	75.0	75.0	80.0	76.4	50.0	54.5		
Blood:												
Wassermann positive ...	99.2	76.3	95.0	70.6	62.5	50.0	50.0	64.7	37.5	45.5		
Flocculation tests positive ...	99.2	98.3	100	94.1	100	75.0	80.0	88.2	100	100		

to good results. The average number of rigors for the 245 first attacks was 7.5, and all but thirteen of these attacks were terminated by quinine. On the other hand, thirty-three of the forty-nine second attacks, and six out of the nine third attacks ceased spontaneously, and consequently the average number of rigors fell to 5.1 and 4.3 respectively.

In addition to inoculation with malaria, ultra-violet light, either alone or combined with auto-haemo-injections, was given to thirty-four patients, while forty-three had tryparsamide. To seventy-two cases one or more of the following were also given: bismostab, bivitol, bisglucol, iodo-bismuthate of quinine, stovarsol, sodium stovarsol, and acetyl-arsan.

CLINICAL RESULTS

Except for one patient with tabes, two with meningo-vascular syphilis who were discharged after intensive antisyphilitic treatment, and five recent admissions, all the non-malarialized patients are now dead, the majority having died within two years of admission. A large number of the malaria cases, however, are still in hospital; 30 per cent. have been discharged or transferred improved (some of these relapsing after a variable number of years), and of the 112 patients who died nineteen lived over three years. From a recent follow-up of old discharges these facts emerge. Of the 1923 admissions alone, thirty-six patients were treated by malaria; in 1933, ten years later, six were known to be at home (five being in very fair health) and five were still alive here. Of the 1924-7 group eighty-three had malaria; in 1933 twelve were known to be at home and fourteen were still alive in hospital (here or elsewhere), while seven more had been discharged but lost sight of. In the 1928-30 group forty-seven had malaria; twelve of these are now at home, eleven more are alive here, and six are untraced.

GENERAL OBSERVATIONS

That these results are not entirely due to malaria having been given only to early and hopeful cases is shown by the fact that of the 120 patients admitted in a bed-ridden condition no fewer than fifty-six had malaria, six being subsequently discharged, and eight more being still alive here, some after many years. With regard to habits as an indication of the stage of the disease, it may be mentioned that of the 207 patients who were admitted wet and dirty, malaria was given to 119, and as a result fifty-four became clean.

A renewal of malarial treatment in unimproved cases seems justified, for we have had seven patients who showed no benefit from the first attack and yet were discharged after the second. With regard to the addition of arsenical and bismuth preparations to malarial therapy the tables will show that we have had excellent results from malaria alone, but it would appear that these adjuvants rather hasten the clinical improvement as well as the serological amelioration. There are now sixty-four patients remaining in hospital (fifty-eight having had malaria), but only three are bed-ridden, five only are wet and dirty, and three have good prospects of an early discharge. The others are, for the most part, bodily fit and able to do physical work.

SEROLOGICAL CHANGES

As the majority of our long-treated cases examined serologically have naturally been drawn from those remaining in hospital—and therefore unimproved—a glance at the tables will show once more how little serological changes and clinical improvement go hand in hand. It will also be apparent that great improvement is often found in the fluid and blood reactions, but that this is most marked many years after the conclusion of the malarial treatment. Completely negative fluids, moreover, have been obtained by means of malaria alone. The specific tests for syphilis change more readily in the fluid than in the blood (sometimes relapsing later), the flocculation tests being more sensitive, and therefore more refractory after treatment, than the Wassermann. After the sixth year there is little likelihood of a Lange of 4 or 5 being found, while few cases show any abnormal cell count; the globulin also is negative by this time in the majority of cases.

CONCLUSIONS

Malarial therapy undoubtedly improves the bodily health. It prolongs life to a marked degree in some 35 per cent. of cases, and it has a beneficial effect upon the patient's habits and cleanliness. In about 18 to 20 per cent. of the patients it produces a clinical improvement that, as far as can be said at present, is likely to last many years, and often allows of a resumption of healthy and useful home life.

We are indebted to the medical superintendent, Dr. F. M. Rodgers, for permission to publish these results.