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STUDIES IN THE TREATMENT OF MALARIA

XXIX. ORAL ADMINISTRATION OF LIQUOR
ARSENICALIS MINIMS 30 DAILY FOR 16 DAYS
WITH QUININE BIHYDROCHLORIDE GRAINS
15 INTRAMUSCULARLY ON THE 1ST AND 2ND,
8TH AND 9TH, 15TH AND 16TH DAYS, IN SIMPLE
TERTIAN MALARIA

BY

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In a previous paper (1919) we recorded the results of administering Liquor arsenicalis in large doses, minims 30 daily, over a period of eight weeks in combination with two initial intramuscular injections of quinine bihydrochloride grains 15 on two days only. This treatment, which was administered in thirty-two cases, was followed by four relapses only (12·5 per cent.) within an observation period of sixty days after cessation of treatment.

The present observations were undertaken in order to ascertain whether an equally favourable result could be got with a similar treatment of shorter duration.

The records of the observations are given in the tables and charts, in which :—

- T. = simple tertian trophozoites or schizonts.
- G. = simple tertian gametes.
- Neg. = no parasites found.
- A. = oral administration of liquor arsenicalis minims 30.
- Q.M. = intramuscular injection of quinine bihydrochloride grains 15.

Liquor arsenicalis minims 30 daily were given for sixteen days and an intramuscular injection of quinine bihydrochloride grains 15 on the first and second, eighth and ninth, fifteenth and sixteenth days.

Cases 1598—1642

Forty-five cases (Table I) were treated in this manner. All were adult males, the majority of whom were infected either in Macedonia or in East Africa. In every instance a diagnosis of simple tertian malaria was made microscopically, and in all cases parasites were present in the blood on the day treatment commenced. Blood examinations were made daily.

In four of the forty-five cases treatment was commenced during an apyrexial period. In thirty-nine of the remaining forty-one the temperature fell to normal within three days, and in one case in four days; in the remaining case (1630), owing to intercurrent disease, the temperature was uncontrolled until the fourteenth day.

In forty-one cases parasites disappeared from the cutaneous blood in one to two days, in three cases in three days, and in one case in four days.

Relapses. In nine of the forty-five cases parasitic relapses occurred in seventeen to fifty-six days, and febrile relapses in twenty-six to fifty-six days, after cessation of treatment. In twenty-one cases the observation period was less than sixty days,* consequently the minimum percentage of cases which relapsed (those actually observed) is 20 per cent., and the possible maximum (those actually observed + the number of cases discharged before completion of the sixty-day post-treatment observation period) is 66·6 per cent. Two of the cases (1600 and 1616) which did not relapse within the sixty-day observation period, did so on the sixty-eighth and sixty-fifth days respectively.

* This was due to the demobilization which took place subsequent to the date of the Armistice, 11.11.18.

TABLE I.

Summary of results of oral administration of Liquor arsenicalis, minims 30 daily, for 16 days + quinine bihydrochloride, grains 15, intramuscularly, on the 1st and 2nd, 8th and 9th, 15th and 16th days, in simple tertian malaria.

* E. = Egypt. E.A. = East Africa. I. = India. M. = Mesopotamia. P. = Palestine. S. = Salonika.

Number of case	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of end of treatment	Temperature fell to normal in — days after first dose	Parasites disappeared from cutaneous blood in — days after first dose	Parasitic relapse occurred in — days after last dose	Febrile relapse (above 100° F.) occurred in — days after last dose	Observation period (in days) in cases which did not relapse	Remarks
1598	M.	29	29	6	15.12.18	1	1	...	...	50	Quinine orally, gra. 30 on 24th day. Relapsed on 68th day.
1599	E.A.	11	10	4	15.12.18	3	1	18	...	...	
1600	S.	...	7	6	15.12.18	2	1	...	...	67	
1601	E.A.	21	11	8	17.12.18	2	1	48	47	...	
1602	S.	30	4	4	17.12.18	Apvrexia	1	...	...	46	
1603	S.	18	4	4	18.12.18	3	2	...	...	65	
1604	E.	2	8	2	18.12.18	3	2	...	...	65	
1605	S.	16	5	4	18.12.18	1	2	...	...	98	
1606	S.	14	1	1	20.12.18	Same day	1	...	...	61	
1607	S.	31	2	2	21.12.18	Apvrexia	1	...	...	70	
1608	S.	35	9	7	21.12.18	1	3	...	...	70	
1609	S.	1	1	1	24.12.18	1	4	...	...	74	
1610	S.	41	18	4	24.12.18	Same day	1	31	32	...	
1611	S.	14	4	4	25.12.18	1	1	...	...	50	
1612	E.	28	5	5	28.12.18	1	1	...	...	89	
1613	S.	28	3	3	15.1.19	1	1	...	...	76	
1614	S.	15	4	4	18.1.19	1	1	...	...	63	
1615	...	...	...	...	21.1.19	2	2	56	56	...	Relapsed on 65th day.
1616	...	...	...	...	23.1.19	1	2	...	...	64	
1617	...	...	...	...	28.1.19	1	2	...	...	50	
1618	P.	4	1	1	31.1.19	2	2	...	...	62	
1619	E.	5	...	2	4.2.19	3	1	...	...	70	

TABLE I—continued

Summary of results of oral administration of Liquor arsenicalis, minims 30 daily, for 16 days + quinine bihydrochloride, grains 15, intramuscularly on the 1st and 2nd, 8th and 9th, 15th and 16th days, in simple tertian malaria.

* E. = Egypt. E.A. = East Africa. I. = India. M. = Mesopotamia. P. = Palestine. S. = Salonika.

Number of case	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of end of treatment	Temperature fell to normal in — days after first dose	Parasites disappeared from cutaneous blood in — days after first dose	Parasitic relapse occurred in — days after last dose	Febrile relapse (above 100° F.) occurred in — days after last dose	Observation period (in days) in cases which did not relapse	Remarks
1620	E.A.	11	8	2	4.2.19	2	3	28	...	...	Quinine orally, grs. 30, on 29th day.
1621	E.A.	11	2	2	5.2.19	Same day	2	...	...	70	
1622	S.	20	2	2	5.2.19	Apyrexia	1	...	...	58	102.8° F. on 18th, and 102.4° F. on 28th days.
1623	P.	3	1	1	13.2.19	Same day	1	34	35	...	
1624	S.	5	2	1	14.2.19	1	1	...	...	14	
1625	I.	11	3	3	19.2.19	Apyrexia	1	...	...	52	
1626	...	...	...	...	22.2.19	1	2	17	...	...	Quinine orally, grs. 45, on 20th day.
1627	E.A.	20	17	9	23.2.19	2	1	...	...	5	
1628	...	...	...	...	25.2.19	1	1	...	...	32	
1629	...	...	...	...	25.2.19	2	1	...	...	32	
1630	...	...	...	...	25.2.19	14	2	...	...	21	
1631	P.	8	...	2	25.2.19	2	1	...	...	50	
1632	E.	3	3	0	26.2.19	1	1	25	26	...	101.4° F. and 100.4° F. on 3rd and 4th days.
1633	E.A.	11	6	0	27.2.19	3	2	23	24	...	
1634	...	...	...	...	27.2.19	1	2	...	...	30	
1635	...	...	...	...	27.2.19	2	1	...	...	13	
1636	...	...	...	...	28.2.19	2	1	...	...	18	102° F. on 7th day.
1637	...	...	...	...	2.3.19	1	1	...	...	16	
1638	...	...	...	...	2.3.19	4	3	...	...	15	
1639	...	...	...	...	2.3.19	Same day	2	...	...	17	
1640	...	...	...	...	5.3.19	Same day	2	...	...	13	
1641	S.	8	5	2	6.3.19	1	1	...	...	60	
1642	E.	21	...	1	13.3.19	2	2	...	...	21	

TABLE II.

Summary of results of intramuscular injections of quinine bihydrochloride grains 15 on each of two consecutive days only in simple tertian malaria (control series).

Number of case	Date of end of treatment	Temperature fell to normal in — days after first injection	Parasites disappeared from cutaneous blood in — days after first injection	Parasitic relapse occurred in — days after last dose	Febrile relapse (above 100°F.) occurred in — days after last dose	Observation period (in days) in cases which did not relapse	Remarks
1643	9.3.19	1	1	13	15	...	
1644	22.3.19	2	4-5	19	22	...	
1645	30.3.19	2	5-6	16	18	...	
1646	4.4.19	1	2-12	12	12	...	
1647	5.4.19	1	2-11	18	18	...	
1648	6.4.19	Apyrexia	...	9	22	...	
1649	6.4.19	1	3-10	21	23	...	
1650	7.4.19	4	2-4	4	25	...	
1651	9.4.19	1	2	...	...	20	
1652	9.4.19	Same day	1-7	16	16	...	101°F. on 9th day. 102.6°F. on 10th day.
1653	10.4.19	1	2-5	10	13	...	
1654	10.4.19	1	2-5	17	18	...	
1655	10.4.19	Apyrexia	1-5	15	...	...	Quinine orally, grs. 45, on 21st day.
1656	10.4.19	2	2-5	12	14	...	
1657	11.4.19	1	1-4	17	18	...	
1658	11.4.19	Apyrexia	1-5	13	15	...	
1659	11.4.19	Same day	1-4	...	...	24	
1660	13.4.19	Apyrexia	1-3	14	...	...	Quinine orally, grs. 45: on 19th day.

CONTROL SERIES (Cases 1643—1660)

Quinine bihydrochloride grains 15 on each of two consecutive days only.

In four of the eighteen cases (Table II) treatment commenced during an apyrexial period; in thirteen cases the temperature fell to normal in two days, and in the remaining case in four days. Blood examinations were too infrequent to give a figure for the time of disappearance of parasites from the cutaneous blood.

Relapses. In sixteen of the eighteen cases parasitic relapses occurred in four to twenty-one days, and febrile relapses in twelve to twenty-five days, after cessation of treatment. In the two cases (1651 and 1659) which did not relapse the observation period was less than sixty days, viz., twenty and twenty-four days respectively. Consequently the minimum percentage of cases which relapsed (those actually observed) is 88·8 per cent., and the possible maximum (those actually observed + the number discharged before the completion of the sixty-day post-treatment observation period) is 100 per cent.

CONCLUSION

It is not possible to form a definite estimate of the value of this treatment, as almost half the cases were insufficiently observed after cessation of treatment.

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