Clinical and laboratory experiences of malaria in a Seremban medical practice during the two years: 1970 — 1971.

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Introduction

THIS IS A SHORT factual report of the authors' experience of malaria during the 24 months which commenced on January 1st, 1970 and ended on 31st December, 1971. All incidences of malaria are those occuring in patients attending the writer's clinic in Seremban, Negri Sembilan. Only cases attending the clinic, or discovered on domiciliary visits, are included. Malaria episodes occuring on rubber or oil palm estates (total population over 20,000 persons) visited by the authors are not dealt with in this report.

The reasons which prompted this report were, firstly, the intrinsic interest of such a report and secondly, to put on record, without ambiguity, the actual number of slide-proven cases of malaria infection in a particular medical practice over a given period — in this case, 24 months. We say 'slideproven' advisedly as only cases of malaria where the parasite could be clearly identified are included. While a diagnosis of "clinical malaria" was made many times over the period under study and the patients treated accordingly, all the figures reported here are parasitologically proven malaria.

While the figure produced here are "absolute" figures in the sense that they are those obtained as a result of examining patients attending a particular medical practice in a particular place over

a particular period of time, there is no reason to assume that they are peculiar to this practice. It must be presumed that similar medical practices in the same area see the same type of patients with similar social, ethnic and geographical back grounds. Huehne et al. (1967) stated that malarial statistics in West Malaysia closely reflect the traditional malaria control schemes with the stress on urban and estate malaria control. The resultant data emphasise microscopically diagnosed malaria admissions in hospitals and are not representative of the major section of population under risk, i.e. the true rural or "kampong" population. They conclude that this results in gross underestimates of the amount of malaria in the country.

It is hoped that a report such as this will serve a useful purpose in making medical practitioners more malaria conscious and resort more frequently to the use of the microscope in the diagnosis of the febrile patients. The report of Toh and Yeo (1971) on malaria in Singapore, an area many believed to be malaria-free, emphasises that a prerequisite to the diagnosis of malaria is an awareness of its presence.

Materials and Methods

All patients attending the clinic (including patients attended on domiciliary visits) were closely questioned to elicit a history suggestive of malarial infection and blood slides taken for examination in suspected cases. During the height of the maximum malaria transmission season, all patients who were willing to co-operate had blood examination. From mid-April to mid-July, relatives who accompanied patients were also examined where possible. In cases where the physician felt that malaria was clinically the most likely diagnosis, the blood tests were repeated if initially negative.

Thick films, using Field's quick staining method was the standard procedure — when pressure of work was less heavy, thin films were also examined.

In the 12 months (1970), 6,382 blood examinations for malaria were made.

In the 12 months (1970), 1,664 blood examinations were positive for malaria.

In the 12 months (1971), 6,767 blood examinations for malaria were made.

In the 12 months (1971), 1,829 blood examinations were positive for malaria.

There is not an absolute relationship between these two figures, as many of the examinations were repeated tests before the parasite was discovered and also many were follow-up tests after treatment.

Analysis of Positive blood slides:—

Table I

		1970	1971
Total no. of blood examinations	=	6382	6767
Total no. of blood film positive for malaria	=	1664 (26%)	1829 (27%)
Male	=	905 (54.4%)	957 (52.3%)
Female	=	759 (45.6%)	872 (47.7%)

In 1970, the figure of 1,664 positive blood slides represent 1,664 episodes of malaria in *1,273 individuals.*

In 1971, the figure of 1,829 positive blood slides represent 1,829 episodes of malaria in *1,594 individuals.*

These figures represent in some cases follow-up blood examinations after treatment, indicating either actual failure of treatment (especially in P. falciparum) or recrudescence (P. vivax). Some episodes were presumably fresh infections (P. falciparum) many months after initial treatment and clinical and parasitological cure. As in other series, males predominate but in this series the sex difference is not significant.

Table II
Incidence in Ethnic Group

	1970	1971
Malay	853 (51.2%)	810 (44.3%)
Indian	397 (23.9%)	523 (28.6%)
Chinese	354 (21.3%)	456 (24.9%)
Europeans & Others	60 (3.6%)	40 (2.2%)
	1664	1829

As can be seen in Table 2, the greatest incidence was among Malay patients — all but a very few of whom came from the rural areas, i.e. kampongs and land development schemes. While some of the Indians came from the town areas, the vast majority came from rubber or oil palm estates. Many of the Chinese came from Seremban town and its environs, others from rubber estates, small villages or even logging camps in the rural area. The remainder were Europeans, all of whom came from rubber or oil palm estates, with the exception of one bank executive in the town and four dependants of British army personnel who were resident in Seremban in early 1970.

Age Distribution

While we have only divided our subjects into two age groups, i.e. under 12 years and over 12

years, we found, as others have, that malaria has a predilection for the young and most of our cases were under 35 years of age.

Table III
Age Distribution

	1970	1971
Children under 12 years:		
Under 2 years =	180 (10.8%)	187 (10.2%)
3 — 5 years =	129 (7.8%)	150 (8.2%)
6 — 12 years =	198 (11.9%)	213 (11.6%)
Total =	507 (30.5%)	550 (30.0%)
Adults and children over 12 years =	1157 (69.5%)	1279 (70.0%)
Total =	1664 (100.0%)	1820 (100.0%)

Our youngest patient was 18 days old (mixed P. vivax and P. falciparum). The mother of this infant also had a mixed infection as had 9 other members of that family. Over the two-year period, we had 22 episodes of cerebral manifestations in children under 12 years of age — ranging from behaviour disorder (aggression, hostility and altered mood) to stupor and semi-coma. As to the former, one eight-year-old Malay boy, with heavy falciparum infection, chased his grandmother with a chopper before he developed rigors which indicated his physical illness to his parents.

Table IV
Type of Malaria

	1970	1971
P. vivax	1187 (71.3%)	1112 (60.8%)
P. falciparum	436 (26.2%)	619 (33.9%)
P. malariae	3 (0.2%)	Nil
Mixed vivax & falciparum	38 (2.3%)	98 (5.3%)

Falciparum malaria was certainly a greater problem from the therapeutic point of view in 1971. While there was an actual increase in the number of individuals with falciparum infection in 1971, some of the increase is more apparent rather than real as some of the *incidents of parasitaemia* reported were those occuring in the same patients who failed on chloroquine therapy. It is of interest that in the Singapore report (Toh and Yeo 1971) falciparum predominated.

Table 5 calls for some analysis to see the figures in true perspective. While the overall figures for Negri Sembilan are higher in 1972 than in the preceding year, the greatest number of repeat blood examinations took place in this group. The actual number of individuals infected remained about the same. For obvious reasons (the clinic and laboratory

Table V
Allocation of Cases According to area

	1970	1971
Negri Sembilan (Total) =	1523 (91.5%)	1664 (90.97%)
Seremban Town Board =	727 (43.7%)	639 (34.93%)
N.S. (outside Seremban)	796 (47.8%)	1025 (56.04%)
Selangor =	71 (4.3%)	113 (6.17%)
Pahang =	46 (2.8%)	11 (0.6%)
Malacca =	20 (1.2%)	27 (1.47%)
Johore =	2 (0.1%)	13 (0.71%)
Perak =	2 (0.1%)	1 (0.05%)

are in this state) the overall percentage of cases (of the total) is the same. There has been a marked drop in cases occuring in the Town Board area and once again, the drop is much greater than the figures suggest — there were more repeat blood examinations in town patients close to the clinic than in any other group. This drop was due, we feel, to our increased reporting of malaria and vigorous steps taken by the health authorities to deal with mosquito breeding as a result of these reports.

The number of cases reported in individuals from other states will vary from such diverse reasons as the heavy floods in the earlier part of 1971 and difficulty in travelling to the clinic because of road conditions, to the fact that in 1970 many people were sent from Pahang land schemes for blood screening (and this did not happen in 1971).

However, the Selangor figures are of interest. In 1970, we saw 71 cases of malaria from this state from an area just bordering Negri Sembilan in the north. This year, very few cases were detected from this area (the number of *patients* coming from this area did not drop) and it is assumed once again that reporting the cases had the desired effect. However in 1971, 113 cases from Selangor were detected and reported. 84 of these cases were from *one estate* in a different area along the state border and many of them were Chloroquine resistant falciparum malaria as confirmed by culture and in-vitro testing at the United States Army Medical Research Unit at the Institute for Medical Research in Kuala Lumpur.

The "Seasonal Variation" in Malaria Incidence

While in the equatorial zone malaria transmission is possible all the year round, our experience is consistant with established belief that there are

two "seasons" of maximum transmission, i.e. the spring season (mid-April to mid-July) and the autumn season (October to November) (Sandosham 1965). It is of interest to note how malaria incidence "snowballs" from March to reach a peak in late June — early July and then drops off quite abruptly. This held true for 1970. It was a very classical year. The rise in November-December, 1970 was consistent with the autumnal rise. Many of these were possible recrudescences of Vivax malaria and Gametocyte carriers. The picture in 1971, while it followed the general pattern of 1970 differed in as much as a higher level of transmission appeared to be taking place in the first 3 months of the year. The "rise", when it did come, was about one month late and did not come to a sharp peak and rapid fall-off as in 1970. There was more of a plateau curve and the September to December level was sustained with a sharp rise in December, i.e. 228 cases in December, 1971 as against 93 in the corresponding month of 1970.

What is most pertinent in studying this graph is to be aware that malaria transmission *is* taking place all the year round and to dismiss malaria as a possible diagnosis "because it is not the malaria season" can be a dangerous error in clinical medicine.

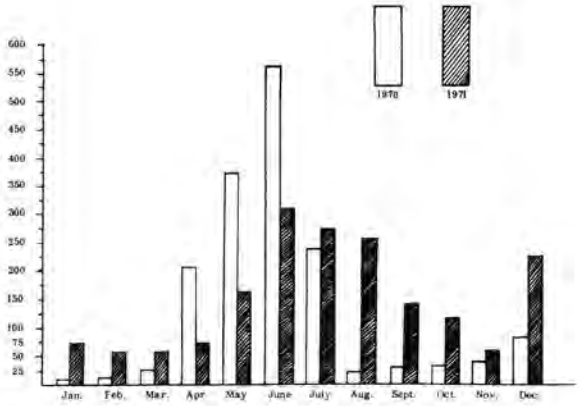
Discussion

This report being in the nature of a "stock taking" of the incidence of malaria parasitaemia in the writer's own practice needs little further elaboration. All cases of malaria presented were notified week by week to the relevant health authorities (i.e. to the M.O.H. of the patient's district) as is required by law. An analysis of the figures is of interest as one tends to remember months when febrile illnesses were more common than usual but in the absence of meticulous blood examination, one can only form an "impression" that malaria may have been the cause.

From the clinical standpoint, several features of interest arise. The amount of "reported malaria" depends primarily on the clinician — not on the laboratory services. If the physician feels strongly that his patient has malaria, he will order repeated tests. The laboratory will only usually deal with what is sent to it. This is what in fact happened here. Whenever patients were willing to co-operate (they usually were), repeated blood tests were made. We found that if the parasite was not found on examining 200 fields, it was better to take a second blood sample right away (or even later in the day) than to continue searching on the same slide. The number of occasions that a patient, who

TABLE 6

POSITIVE BLOOD SLIDES MONTH BY MONTH 1970 - 1971



was negative on first test and then produced the parasite in the first 10-20 fields on the next test (often half an hour later) was legion. We also made a practice of recording how many fields were examined before detecting the parasite. These figures have not been analysed as yet.

The other feature that was of clinical interest was that at the height of the "season" we could predict, with a high degree of accuracy, that the patient was probably having falciparum malaria. This was especially so with children. If the patient presented with a moderate pyrexia (under 100°F), pallor, sweating, and complained of nausea with one or two loose stools (with or without abdominal pain) falciparum was very likely. If he presented on the first day of his illness, the parasite was usually found without much searching but if on the second or third day, repeated tests had often to be made. This type of "abdominal malaria" or "intermittent bilious malaria" as described by the older workers was quite common in 1970. Vivax malaria, in general, tended to be more dramatic in its onset but less serious in its clinical course, whereas falciparum came in like the proverbial lamb, but untreated, became a lion that required considerable taming!

One of the problems we encountered in this work is ironic and not a little paradoxical! Patients (and not a few medical men) will accept a clinical diagnosis of malaria (in the absence of a blood examination) with good grace on the basis that anything is possible and as long as they get well, it does not really matter. It is, however, surprising how many resent a diagnosis of malaria which has been made after a careful search for, and discovery, of the parasite. This is especially so in patients

who have not experienced the classical triad of chills, fever and sweats. Many such patients who present with low-grade fever (or are apyrexial), cough, malaise and often insomnia, will only reluctantly admit to attacks of "flu" over the preceding days or weeks. Many have already had courses of antimalarials (along with other drugs) and the parasite is difficult to find.

Whatever the merits of the old arguments that vivax malaria in semi-immune adults (who are asymptomatic) should be left alone, one cannot stress too strongly the dangers of missing the diagnosis of falciparum malaria in infants and young children. This form of malaria so often presents with vomiting and diarrhoea (with or without bronchitis) which fails to respond to anything other than specific antimalarial therapy (especially parenteral quinine at the onset of treatment) that failure to examine the blood for malarial parasite in an endemic malarial zone in such cases is a dangerous omission, to say the least!

There is little scope in this brief report to deal with chemotherapy of malaria in details — we are dealing here chiefly with personal experiences over the past two years and have gone into this problem in depth recently elsewhere (O'Holohan and Matthews 1971).

There is much work being done at present on the role of the 4-aminoquinolines in malaria chemotherapy. That P. falciparum is Chloroquine resistant in many areas of West Malaysia is now an established fact. A more vexed question is the status of the 4-Aminoquinolines and P. vivax. We have found it necessary to use larger and more prolonged dosage schemes to clear the blood of the asexual stage of P. vivax than heretofore. The moral is that one must not adhere blindly to the recommended dosage, i.e. 900 mg. base the first day, followed by 300 mg. base in divided doses to a total of 1.5 G.. McKelvey et al (1971) recommended up to 2.5 G. to 3 G. total dose in, especially, falciparum malaria before declaring the parasite drug resistant.

Before assuming that vivax malaria is failing to respond, it must be ascertained that the patient is taking the drug and furthermore is getting enough of it for a sufficient period of time. This is important because our experience is that about 60% of adults suffer side effects from the 4-Aminoquinolines, some of them intolerable and certainly more disabling than their vivax malaria. Fortunately children are more tolerant of this drug.

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