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RADICAL CURE OF MALARIA AND OPERATIONAL  
DIFFICULTIES IN IMPLEMENTATION

By

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Drugs of the 8-aminoquinolines having action against the persistent tissue phase of P.vivax and P.malariae are considered to be true anti relapse drugs. Although pamaquine had been in use in the past for radical treatment the drug was found to be toxic in susceptible cases. Adverse side symptoms were also common. During the post war period the newly developed preparations like pentaquine, isopentaquine and primaquine, all of the 8-aminoquinolines series received extensive trial in various countries and primaquine was established to be the most suitable preparation for radical treatment.

During 1949 and 1950 primaquine had received trial in U.S.A. in two penitentiaries namely Seagaville (Texas) and Statesville (Chicago). These investigations and subsequent trials on U.S. troops returning from Korea established that a 15 mg. of primaquine regime for 14 days ensured radical cure almost in every case infected with the various local strains. On the basis of these observations the standard regime recommended for radical cure was an initial dose of 0.6 gm. of 4-aminoquinolines followed by a 15 mg dosage for 14 days.

Meanwhile investigations carried out in India from 1950 to 1954, both under hospital and field conditions clearly demonstrated that after an initial dose of 0.6 gm of chloroquine or camoquine a 15 mg regime administered daily for five days effected radical cure in P.vivax infection

very satisfactorily. These observations and subsequent large scale field studies would indicate that the relapse rate after a 5-day primaquine treatment did not exceed beyond 1 to 5 per cent. Neither any toxic symptoms nor any adverse side effect was recorded in a single patient out of nearly 2000 cases treated.

In view of these observations the following regime was considered suitable for surveillance operations under the National Malaria Eradication Programme in India:-

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|-------------------------|--|
| (1) <u>Day - 1</u>      | a) 0.6 gm. 4 aminoquinolines<br>b) 15 gm. Primaquine |
| (2) <u>Day - 2 to 5</u> | 15 mg. Primaquine                                    |

The above dosage schedule is for adults and proportionately smaller doses are recommended for children according to age. As primaquine tablets are hard and therefore pose problem when administered in fractional dosages, only 2.5 mg tablets are imported under the Indian Programme.

The organizational pattern adopted for active surveillance operation under the Indian programme is as follows:-

- a) 100 surveillance workers have been provided per unit designed to cover one million population.
- b) Each surveillance worker is assigned 2000 houses which are required to be visited twice a month with a 12-day cycle (24 working days).
- c) The worker is required to make the necessary standard enquiries by domiciliary visits, take blood smear from fever cases and administer presumptive treatment with 4-aminoquinolines.
- d) There are twenty-five surveillance inspectors per unit and each inspector is to supervise over four surveillance workers, as well as institute radical treatment where necessary.
- e) Such treatment is instituted by the inspectors in respect of all cases detected under passive or institutional surveillance except those treated by the physicians.
- f) In the event of any adverse side effect detected in any case, or toxic manifestations like cyanosis of the gums and lips noted immediate report is to be sent to the unit officer who is usually a medical graduate.

Prima facie the system adopted should not pose any problem of operational or technical nature more so when so far there has been no report of toxic manifestations (from records available for 9,992 P.vivax cases treated in 1961). Further, for uniformity all positive cases

receive the same treatment under the Indian programme. This includes even cases of P.falciparum and those with mixed infection due to P.vivax or P.malariae and P.falciparum. This has an added advantage in that the gametocytes of P.falciparum are also destroyed by primaquine.

However, the main operational difficulties experienced so far could be grouped under the following:-

1. High incidence of cases or in an outbreak.
2. Communication difficulties particularly in hill sectors and also during the monsoon or under unusual conditions like flood.
3. Difficulty in locating cases on account of incomplete address.
4. Problem of nomads and certain hill tribes who move from place to place in different seasons.
5. Engineering, construction and power project areas.
6. Refusal to take drug.

These may be clarified further and remedial measures being taken may be explained as indicated below:-

1. High incidence of cases or in the event of an outbreak

As a rule surveillance operation is initiated when the number of cases is low. However, it is only after the machinery is established, it is possible to estimate the actual number of cases. Therefore, when large number of cases are detected in some foci and within a short period, the surveillance machinery is likely to go off the gear. This is because, each positive case is a break in the movement of the inspector as he has to make contacts with each for five consecutive days.

In such cases and in the event of an outbreak the malaria inspectors and surveillance staff from other areas are requisitioned to attend to the emergency.

2. Communication difficulties

Normally in areas where communication difficulties pose a serious challenge the workload of a worker or inspector is much less than those working under better conditions. In hill sectors and forest areas radical treatment is likely to be interrupted for days or weeks, during heavy monsoon. In such circumstances operation is resumed as soon as conditions are suitable. The same is applicable in respect of areas subjected to flood.

3. Incomplete address

Under active surveillance this factor is usually not a problem for obvious reasons. However in hospitals, dispensaries etc, particularly in urban areas quite often illiterate patients or relatives are unable to furnish the correct address although they may indicate the locality.

This could often be rectified by recording the location of the grocer's shop on which the patient is dependent.

4. Nomads and other moving population

The problem of nomads is common in most countries. Attempt is being made to carry out mass blood survey and institute radical treatment initially to all such population irrespective of the result of blood examination (as sometimes there is a time lag). The head of the community is furnished with a document indicating date of contact, the location and the action taken. It is the duty of every surveillance staff to examine such papers as soon as a community is found to have camped in his zone. If radical treatment had been instituted previously blood smears are required to be taken only from fever cases and presumptive treatment given.

On the other hand, certain tribal population often pose a serious challenge as they migrate from place to place in the forest area in different season in the search for cultivable area. As soon as the crop is harvested they move far into the interior. So far many of such areas are included within the problem units where surveillance is not envisaged some more time. There are five such unit areas in India out of 390. The manner in which the problem is to be solved is under review at present.

There are also instances when patients leave the area suddenly without leaving any address. But they are rare.

5. Aggregation of labour population is a common feature in India in view of the various types of developmental projects. In the past several outbreaks had been recorded. Intensified spray operation often three to four rounds a year, mass chemotherapeutic measures including the use of sporontocidal drug and institution of radical treatment of all break through cases are some of the measures adopted and advocated. These measures are taken besides the normal routine active and passive surveillance operation.

6. The problem of refusal to take antimalarials has not posed a serious problem particularly in respect of those still having temperature. However, if the time lag between collection of blood smear and its microscopic examination is long, occasionally some object to taking drugs when they are afebrile as would be the case because of the presumptive treatment given at the time of collection of blood smears. As a rule this can be solved by a little persuasion.

There are, however, times when some refuse to take anti-malarials at all, particularly the cases with advanced pregnancy, vigilance is kept on these cases and treatment instituted shortly after delivery.

According to the general pattern primaquine is not administered to infants. But these cases are followed and treated adequately when they attain the age of twelve months or more.