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REVIEW OF THE QUARANTINE MEASURES RECOMMENDED
TO PREVENT RE-INTRODUCTION OF MALARIA TO AREAS
IN THE MAINTENANCE PHASE

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Two factors should be present to cause transmission of malaria in an area. Elimination of either factor leads to successful interruption of transmission. These factors are the anophelēs (the vector) and the malaria parasite (the carrier). According to experience, there is practically no way to eradicate the vector. Only through various insecticidal spraying and larviciding is it possible to limit or stop the anopheline activities for a certain period.

The malaria eradication activities are, therefore, directed towards the parasite. To obtain an opportunity to cure the carrier naturally or through radical treatment, residual spraying for a limited period is recommended. "Anophelism without paludism" has been achieved in areas where malaria is eradicated. Maintenance of such areas, with the presence of the vector and the rapid and frequent movement of the people in the world, among whom there may be some carriers, from malarious to non-malarious areas, is to be considered to a great extent.

Certain regulations for pandemic diseases, the announcement of which is compulsory, are prepared with due consideration to the specifications of the disease. Such diseases have a period of

about two weeks incubation after which the disease appears with its clinical and para-clinical symptoms. These symptoms remain until complete cure of the disease is achieved and elimination of its transmission danger is past. The production of a comparative permanent immunity to these diseases among patients, led to an immunization system through vaccinations.

MALARIA

The following specifications of malaria necessitate special regulations:

1. No method of immunization for malaria through vaccination has yet been found.
2. The correct distinction of the disease is only possible through microscopic blood examination. It may be missed between attacks when no parasites can easily be detected in peripheral blood.
3. The incubation period is comparatively long sometimes lasting up to six months (about 200 cases with long incubation periods were observed in Chalus in 1961).
4. Due to absence of the necessary immunity it was not possible to find any vaccine or any such similar material.
5. Plasmodia, especially vivax and malariae, appear in the blood alternatively (erythrocytic cycle). As the disease can only be distinguished by microscopic blood examination, this test may happen during the absence of parasites in the blood.

P. vivax or P. malariae cases if not radically treated, may cause relapses one to three times a year after the first attack. Considering that each crisis is from ten to twenty days, the likelihood of finding parasites during blood examination of cases infected with P. vivax or P. malariae is from three to seventeen percent. This calculation causes the negative result of the blood examination to lose its value. Thus, one may be confident that the quarantine regulations in force for diseases of compulsory notification are not applicable for malaria.

Also the two following principle results are achieved:

- (a) Any man coming from an infected area should be considered as a malaria patient. This is due to the impossibility of distinguishing the absence of disease through one or more blood tests.
- (b) Any man arriving in an infected area cannot be protected against the disease by the use of the present methods.

In this connection, discussions can be held on the malaria specification which may help in the preparation of special malaria quarantine regulations.

1. The malaria parasite in the vector has an evolutionary cycle (sporogony) without which the anopheles cannot transmit the disease. The gametocyte, after the necessary evolution in the vector, should transform into a sporozoite in order to be able to infect a new case. The effective drugs to stop the evolution cycle are the sporontocidal drugs:

8-aminoquinoline, pyrimethamine, proguanil and chloroproguanil. Pyrimethamine is considered most practicable as one dose of it remains effective for two to three weeks without causing any complications. This enables us to administer one dose of pyrimethamine bi-weekly to every individual arriving in a malaria free area during the activity period of anopheline and thus prevent infection of the vector in that area.

2. The parasite during the incubation period has a pre-erythrocytic cycle. The drugs effective in this cycle are 8-aminoquinoline, pyrimethamine and proguanil. 8-aminoquinoline is a good drug, effective on the pre-erythrocytic cycle, but caution should be taken with regard to its complications as a preventive drug. Pyrimethamine is fully effective for P. falciparum without having decisive effects on the P. vivax and P. malariae. Proguanil is also effective during this cycle. Altogether, there is no good and practicable preventive drug. Preference should be given to 8-aminoquinoline. Should there be any sensitivity to this drug, then pyrimethamine or proguanil must be administered.

With due consideration to the points mentioned above, the following items may be proposed to safeguard the malaria free areas from this disease.

- a) The embassies of the malaria free countries which are situated in malarious areas, should issue visas only after checking the malaria card of the traveller to make sure that he is not a malaria carrier at the time.
- b) Every man from an infected area arriving into a malaria free region (whether his blood test results are negative or positive) should take a bi-weekly pyrimethamine dose (50 mg. adult). This could be recorded in his residence permit.
- c) Every man from a malaria free area arriving in an infected region should take a weekly 8-aminoquinoline dose (15 mg. adult).
- d) To prevent transfer of the anopheles from the infected areas, in addition to space spraying of all transportation facilities, residual spraying should be carried out in the ports as well as larviciding proportionate to the anopheles flight range. According to experience, space spraying does not eliminate the anopheles. They will start their activities after the poisonous effect has gone. Anopheles have been observed to rest in the outer cavities of an aeroplane.
- e) According to WHO, attempts should be made in neighbouring countries to commence malaria eradication programmes simultaneously. This is due to the fact that if malaria is eradicated from a country but transmission still goes on at border areas, it is necessary to continue operations at the border areas until the activities in the neighbouring countries attain interruption of transmission.

Should two countries have open borders, the malaria eradication programmes must be fully coordinated otherwise spraying in the malaria free country should be continued for health measures.
- f) In a large country like Iran where malaria eradication operations are at different phases the above mentioned points are not practicable. Experience in Iran has proved that the movement of the people every year from problem areas to clean regions creates new foci. An important point contributing to the creation of such foci, is the undeveloped rural health where cases cannot be detected and treated in time, thus leading to a year by year increase. To protect these regions and to save the cost

until the elimination of the problem in other areas which are approaching interruption of transmission and in order to allow for development of health in every area so that it reaches the necessary level - it is suggested that these areas be sprayed once every three years so that the anopheline density will decrease to an extent when transmission of the disease is no longer possible.

CONCLUSION

1. The specifications of malaria necessitate particular quarantine regulations.
2. Any man coming from an infected area should be considered as a malaria case and should take one pyrimethamine dose bi-weekly.
3. International ports situated in malarious areas should be sprayed and should undergo larviciding.
4. The malaria eradication programmes in neighbouring countries with open borders or without natural barriers (mountains, deserts, seas) should be coordinated.

REFERENCE

- a) WHO Publication No.321-5 December 1961.
- b) "Malaria in Iran" Published by MEO Iran.
- c) "Malaria Foci in the North of Iran" MEO Iran.