

As nurses we should study something about prevention and control of malaria, "Prevention is better than cure". Protection against the bite of mosquitoes is most important. It is always safer to use mosquito nets at night in localities where there is malaria. They must be hung inside the poles and well tucked in all round under the mattress. The use of mosquito boots, veils and gloves help to some extent, so also does the use of medicated cream to exposed parts of the body.

The destruction of adult mosquitoes is the next problem. Spray killing of adult mosquitoes is now recognised as one of the most valuable methods of malarial control. There are several kinds of sprays, but D. D. T is found to be the best. It suffices if a place is sprayed twice a week. Fumigation with sulphur dioxide and cresol vapour is another method. Usually anopheline mosquitoes spend the day time hidden among long grass, in bushes and under leaves, and so it is advisable to clear this away from the vicinity of dwellings.

The next measure to be undertaken is to kill mosquito larvae. This is by complete eradication of breeding places. Jungles must be cleared selectively and places where there is a possibility for stagnation of water must be drained and dried. Adopting sub-soil drainage system is better in places where there is no possibility for open drainage. A preparation of cresol with oil is used to spray the water. Filt and crude oil are also of great value. All vegetation should be removed from the water before spraying.

Where it is not possible to employ the above methods, wells and other sources of water may be stocked with larvivorous fish. There are many varieties of fish which prey on mosquito larvae but to be effective, they should be present in large numbers. Floating weeds and other debris should be removed from the water. Larger fish which may feed on these fish should also be removed. Improvement of economic conditions and use of drugs as prophylactic and curative agents will also help in the prevention and control of malaria.

S. J. Stephens, R. N.,
Miraj.

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BRITISH ACHIEVEMENTS IN TROPICAL MEDICINE NO. 2.

Paludrine Treatment for Malaria.

By Sir Philip Manson-Bahr, M.D., F.R.C.P.,

[Consulting Physician to the Hospital for Tropical Diseases, London]

The epic story of the discovery of paludrine by two British researchers, F.H.S. Curd and F.L. Rose (1) is well known and its action on *Plasmodium gallinaceum* by D.G. Davey is deeply appreciated, so that we are now in a better position to assess the role it may play in the suppression and treatment of malaria.

Paludrine (N1-p-chlorophenyl-N5-isopropyl-biguanide acetate) exerts an action on malarial plasmodia somewhat different to that of quinine or atabrin. Its effect upon the hypothetical exoerythrocytic stages (E.E. forms) of *Plasmodium vivax* and *P. falciparum* is only equalled by that of *Plasmoquine*, but it has the great advantage of being more efficacious and certainly much less toxic.

NO TOXIC PROPERTIES

Two salts are used, the monohydrochloride and the monoacetate and each is sparingly soluble in water, rapidly absorbed and excreted chiefly in the urine. Paludrine is a bitter, colourless substance, particularly devoid of toxic properties and can be tolerated in doses above those necessary to extirpate the malaria parasites. It is also effective against all species. Its chief virtue lies in curing and suppressing subtertian malaria (*P. falciparum*) and this statement entails the hope that in time it should cause the disappearance of blackwater fever, but above all, its main benefit to mankind lies in its prophylactic action.

Paludrine acts most effectively on the asexual forms, but does not extirpate the gametocytes more rapidly than does quinine or atabrin. It acts as a schizonticide, especially on the early forms by interfering with nuclear (chromatin) division. It has now been suggested by Marshall that its chief anti-malarial action takes place by inhibiting oxydation processes in the parasites, but that it does not affect the anaerobic breakdown of glucose to lactic acid.

Though gametocytes of both *P. Vivax* and *P. falciparum*, when ingested by mosquitoes, undergo exflagellation—fertilization, and may even develop into small co yets, yet further development comes to an end. It has been shown that complete sterilization of the gut infection of mosquitoes results within 1-2 hours after 150 mg. of paludrine has been administered to a carrier.

ORIGINAL INVESTIGATIONS.

The original investigations on treatment with paludrine were conducted in Britain at the Liverpool School of Tropical Medicine by Maograith and Adam (2,3) and were subsequently supplemented by those of Fairley and his team at Cairns, Queensland (4). The dosage has ranged from 5 mgm twice daily to 750 mgm. Paludrine can also be injected intravenously in doses of 5 mgm, but this method should necessarily be reserved for the more severe cases (5).

For subtertian malaria (*P. falciparum*) the optimum dosage is 100 mgm three times daily for 7-10 days, but it is claimed that a single dose of 25 mgm suffices to suppress the attack. For benign tertian (*P. vivax*) and quartan (*P. malariae*) large doses are indicated, such as 250 mg. three times daily for the same period.

It is agreed generally that the action of paludrine on subtertian malaria is as satisfactory as that of atabrin, but it does not appear to be as rapid or effective in action, in destruction in the severer forms of subtertian fever. It does not extirpate *P. vivax* from the circulation any more thoroughly than does quinine, though a single dose of 100 mgm suffices to suppress the individual attack [6].

For instance Johnstone [1247] [7] has shown that 10-day treatments with 500 m. g. paludrine daily does not prevent relapses and that the number to be expected is greater than on a similar quinine-plasmoquine course. Another drawback which has lately come to light is the acquired resistance to this drug in chicks infected with *P. gallinaceum* in which paludrine resistance is readily produced in sub-therapeutic doses and that this property can be transmitted by mosquito passage [8,9].

PROPHYLAXIS.

As regard prophylaxis we should define the following terms:

[a] *Gametocyte Prophylaxis*—or prevention of infection by the mosquito on account of the action of drugs on the gametocytes or their precursors in the human body.