GRAMIN VIKAS VIGYAN SAMITI

MALARIA

1996

3/458, Milkman Colony, Pal Road Jodhpur (Raj.) 342 008

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FOREWARD

For times to come Primary Health Workers will continue to provide medical care to peripheral and distant rural population. Malaria has recently emerged as a public health problem, an attempt has been made to prepare a simple manual for there health workers regarding identifying, treating and controlling malaria with peoples participation.

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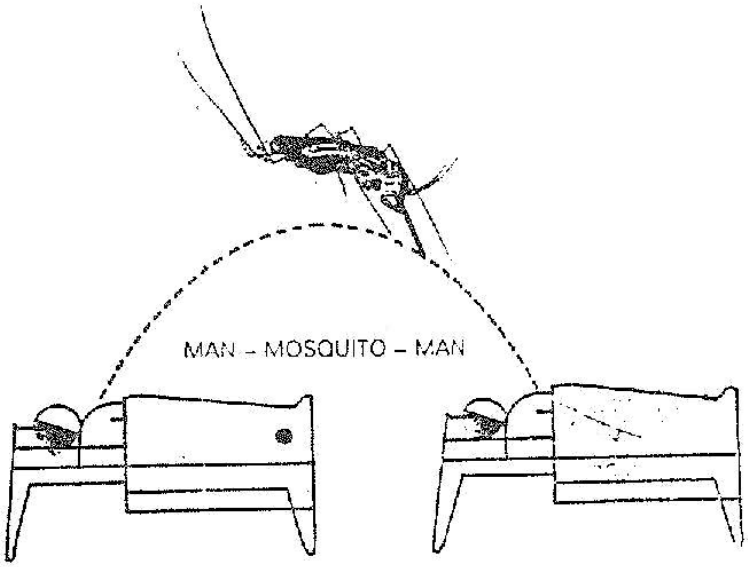
MALARIA

Malaria is a major public health problem in most of developing countries in South East Asia, Africa, Middle East and South America. Malaria is responsible for human suffering, death, and resulting poor productivity and poor economy.

> History has witnessed major influence of malaria on military campaigns for thousands of years Viz., sizeable disease, death and man days lost due to malaria by US navy and marine forces during world war I and II and during Vietnam war (Beadle and Hoffman, 1993)



In the world in 1950s had about 250 million cases with 2.5 million deaths were occurring every year.

Malaria is grossly under-reported. Estimates from consumption of chlorquine indicate that more than 35 million cases are occurring every year in our country. The proportion of more serious/killing form of malaria (p. falciparum) has increased from 21.8 per cent in 1981 to 43.9 per cent in 1991 and even more in desert districts of Rajasthan. Contrary to the prevailing assumption malaria extensively occurs even in the desert area due to underground water reserviors (Tankas) which favour An. stephensi mosquito breeding (Sharma, R. 1994) cases and 452 deaths from malaria occured in Rajasthan mostly from Western thar desert districts during 1994. NGOs had confirmed a higher number of cases and deaths from malaria during the same year (Health for Millions, 1994)

In 1952, 75 million cases of malaria and 80,000 deaths from India were reported. In 1953 National malaria control programme was launched. The activities included fever case surveillance, spleen rate survey, treatment to malaria cases at dispensaries and PHC and DDT spray in hyperendemic areas.

Encouraged by the results in reducing cases of malaria and death, National Malaria Eradication programme was implemented. Now annual parasite incidence (API) was used to classify endemicity of malaria. Areas with API more than 2 were considered problem areas and were sprayed with DDT. Active search for cases, surveillance and treatment of cases were main activities.

After 1965 number of malaria cases once again increased and started doubling every year after 1971.

In 1971 Govt. of India started modified plan of operation (MPO) with stress on decentralisations of anti-malaria activities to PHC level for active case detection (ACD). DDT/BHC spray, microscopy of peripheral Blood film (PBF). Each malaria unit made responsible for one district, zonal entomological teams formed, urban malaria-larvicide measures. Drug distribution centres (DDC) and fever treatment Depot (FTD) were opened in villages malaria control programme at peripheral level is now integrated with primary health care. This also envisage co-ordination with activities of departments of agriculture, irrigation, public health engineer (water supply), education, social development, non-governmental organizations (NGO).

Malaria is commenest cause of fever in India caused by malaria parasite through the bite of an infected female anopheles mosquito. Malaria is characterised by fever with chills, body pain, headache. The fever may be on alternate days (upto 41°C or 106°F) and followed by sweating when temperature comes down. The patient feels exhausted and tired at this stage.

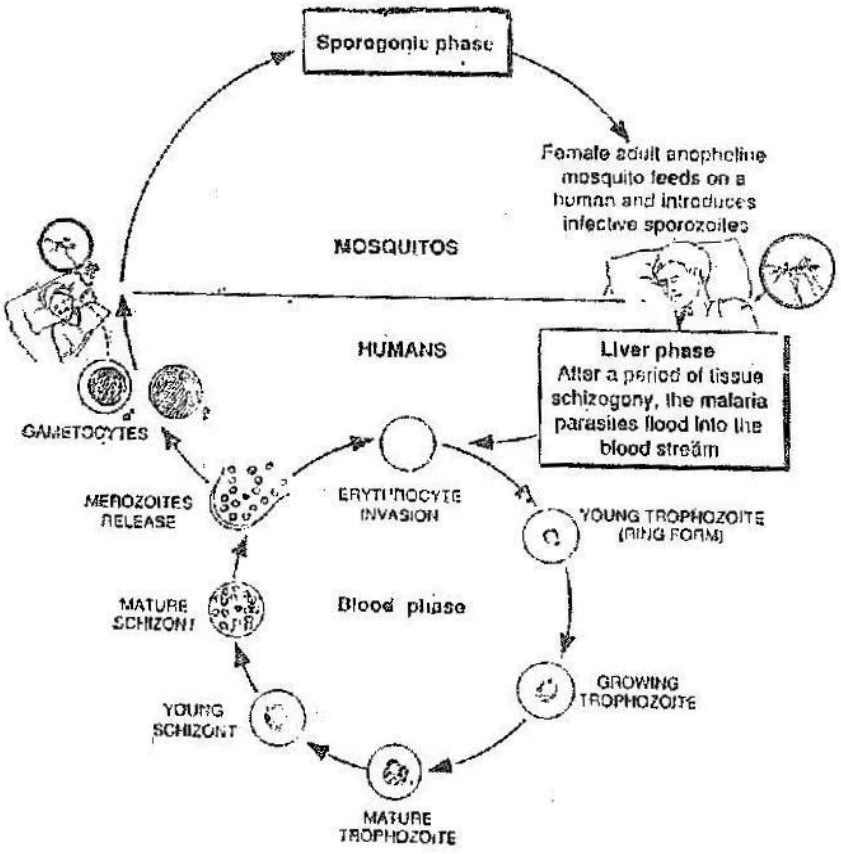
Malaria is responsible for suffering man work days loss, school absenteism and worse outcome in pregnant women (abortion, still birth, premature labour), Anemia resulting from malaria causes severe weakness in the

adults who are unable to earn their livelihood or harvest their crops (health for mlllions, 1994).

There are four types of malaria parasites (p. vivax, p. falciparum, P. ovale and P. malaria) of which the first two are common in India.

The malaria parasite enters the body of female anopheles mosquito during bite (blood meal) on person infected with malaria. The parasite undergoes development and multiplication in mosquito over 10-20 days. (Gometocytes to sporozoites). Now the female anopheles mosquito with sporozoites in its salivary glands if bites a new person will inject malaria parasite in the host who will have fever after about 10 days to 17 days.

The malaria parasite further develops and differentiates into male and female gometocytes in about 10-12 days. Now if a female anopheles mosquito bites this infected man, it will pick up malaria parasite from the patient.



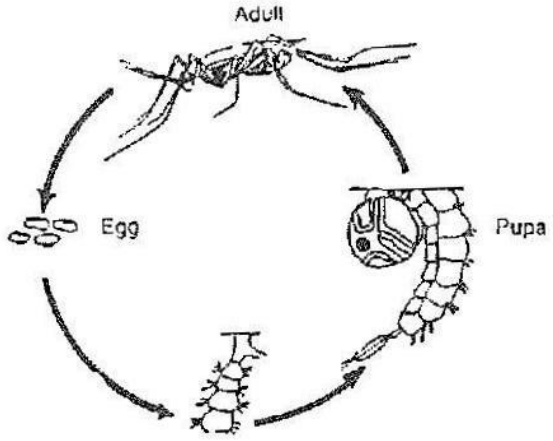
Thus the transmission of malaria continues uninterrupted between man and mosquito untill the control measures are taken. Plasmodium vivax (pv) is comparitively less severe form of malaria than the plasmodium falciparum (pf) which causes severe malaria and death

due to brain fever. Plasmodium falciparum malaria is becoming common over from North East to even in western thar deserts. An. culicifacies and fluritabs have recently entered desert areas along the canal water which are more effective vectors of malaria.

Life cycle of mosquito :—

Anopheline mosquitoes are following :

An. stephensi, An. Fluvitalis, An. culicifacies, eggs, larva, pupa and adult as four stages in the life cycles. From egg to adult stage it takes 7 to 10 days and then lives for about two weeks. Anopheline mosquitoes usually breed in stagnant, clean water in 'tankas'. Overhead tanks, blocked canals, small ditches, water collection after rain, drinking water pitchers, Air cooler tanks etc. Most of them hide in darker zones and prefer biting man than biting other animals. The favourable micro-climate for anophelines breeding are temperature 20-30°C, Humidity 60 percent and altitudes less than 2000 meters. Mosquitoes increase in number from July to November though they may survive throughout the year as their micro climate is favourable in and around human dwelings. Most of the water collections are man made either for his daily requirement, agriculture production, irrigation or poor maintenance of water channels, filling of water in stone quarries and mines.



Host Factors :

Malaria affects all ages from infants to elderly, and both sexes. Males are exposed more due to their outdoor work site and comparatively poor clothing. Pregnant women may abort deliver premature baby. Persons with a genetic disorder sickle cell trait have less severe attak of malaria as seen in Africa. Malaria is more common in poor localities, with poor/primitive housing (dark and less ventilation) providing favourable indoor resting/hiding place for mosquitoes. Nomadism and mobility of populations favours spreading/transmitting malaria to a new area where malaria might have been brought under control. Labourers from one part of country may move alone progress of projects of irrigation, agriculture, industry or even grazing animals. Habits of sleeping outdoor increases risk of man-mosquito contact. This would cause transmission of a different malaria parasite strain (eg. pf). Immunity to

malaria does not exist in nature but develop after an attack providing partial protection against a particular strain of malaria parasite.

Transmission — Vector transmission from infected mosquito (anopheles female) to a susceptible host is the commonest mode. It may transmit through blood transfusion/Pn. Inj.

Incubation period — From bite of mosquito to appearance of fever ranges from 12-17 days. Period of communicability ranges from 10-12 days of fever till male and female gametocytes are circulating in peripheral blood.

Measurement of Malaria —

Spleen Index — Percentage of children (2-10 years) showing enlargement of spleen, which if more than 10% shows a public health problem.

Parasite Rate — Percentage of children (2-10 yrs.) showing malaria parasite in their peripheral blood.

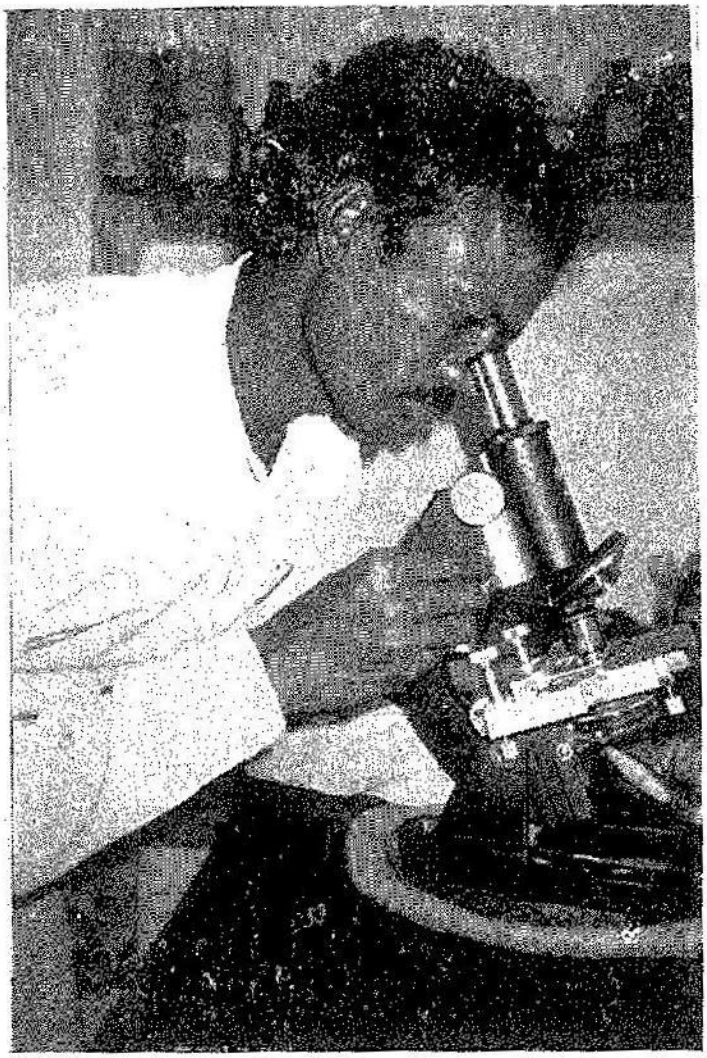
Annual Parasite Incidence (API)

$$API = \frac{\text{Confirmed cases} \times 1000}{\text{Population under surveillance.}}$$

Annual Blood Examination Rate (ABER)

A minimum of 10 percent of population should have blood slide examination.

$$ABER = \frac{\text{No. of slides examined}}{\text{Population under surveillance}} \times 100$$



Prevention and Control of Malaria

Personal protection — To prevent man mosquito contact using repellents (creaus oils) protective clothing, bed nets, wire gauge screening of houses. Covering

water reserves to prevent mosquito breeding. Co-operation in giving blood slide to malaria surveillance worker. Compliance of presumptive treatment and radical treatment.

Vector Control

Larval control — through use of parisgreen, abate. Larvivorous fish-gambusia, gappi.

Putting a thin layer of burnt engine oil or kerosine.

Control of adult mosquitoes through spray of DDT/ BHC., fogging (ULV).

Engineering measures to avoid water collections, blockage of irrigation channels etc. covering the tanker/ water reservoir.

Malaria Parasite (Pl. Vivax)

Malaria Parasite (Pl. Falciparum)

Surveillance

Multipurpose Health worker (MPW) visits each house every fortnight in a population of 10,000. He asks following questions :

1. Is there a fever case at present ?
2. Is there a fever care since his last visit ?

If the answer is yes to any of the two questions, he collects blood film from finger prick and makes a slide for examination. He also gives 4 tables of chloroquine, 150 mg each (600 mg) straight and if the slide is positive for plasmodium vivax, he comes back for instituting radical treatment (primequine 15 mg per day for 5 days).

Control of Malaria

The **passive surveillance** for malaria cases in state medical care units/PHCs is very useful in early detection of the cases and their management.

Treatment

As per national policy following treatment schedule is recommended.

Age group	Chloroquine (150 mg. tab.)	Primaqun (2.5 mg. tab.)	Daraprim pyrimeth
0 - 1 yr.	75 mg.	Nil	6.25 mg.
1 - 4 yrs.	150 mg.	2.5 mg.	12.05 mg.
4 - 8 yrs.	300 mg.	5.0 mg.	25.00 mg.
8 - 14 yrs.	450 mg.	10.0 mg.	37.05 mg.
14 yrs. & above	600 mg.	15.0 mg.	50.00 mg.

Radical Treatment

For plasmodium vivax infection standard treatment is based on a 5 day reginen. The dosage for an adult is :

Day 1 : 600 mg. chloroquine + 15 mg. Primaqine.

Day 2 to 5 : 15 mg. Primaquine daily.

All antimalarial drugs are to be taken after meals (not empty stomache), to avoid nausea, vomiting and pain abdomen.

Prophylaxis : All travellers likely to visit malarious regions are advised to start prophylactic chloroquine orally (300 mg. per week on a fixed day) six weeks before leaving home to six weeks after returning house (WHO, 1993).

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CONTROL OF MALARIA.

- EXAMINE BLOOD SLIDE OF EACH FEVER CASE FOR MALARIA PARASITE.
- ENSURE COMPLETE TREATMENT OF EACH CASE OF MALARIA INCLUDING RADICAL CURE.
- KEEP YOUR SURROUNDINGS FREE OF STAGNANT WATER.
- KEEP WATER RESERVOIRS/ PITCHERS COVERED AND EMPTY THEM ONCE A WEEK.
- GET YOUR HOUSE, CATTLE SHED SPRAYED WITH INSECTICIDE.
- PUT A LAYER OF BURNT ENGINE OIL OVER STAGNANT WATER.
- UES MOSQUITO NETS TO PROTECT AGAINST MOSQUITO BITES.
- MALARIA HAS BAD EFFECTS ON EVERY BODY, WORSE ON PREGNANT WOMEN & CHILDREN.