Director General, CISF has been giving special attention to the prevalence of Malaria among the Force members specially those deployed in Malaria endemic areas like Jharkhand, Chhattisgarh, Bihar, West Bengal and North East regions to minimize chances of infections of Malaria and to protect the troops from his infection. Directorate General CISF has finalized instructions on this subject which are circulated for wide publicity and implementation. The Unit Heads are requested to download the instructions from website & read during Sainik Sammelans & put on notice boards & circulate as well.

MALARIA

Malaria is caused by the bite of infected Anopheles variety of mosquito. It is one of the commonest infectious diseases of the tropics and is a major public health problem in India. Malaria is prevalent throughout the country with varying intensity and endemisity. The causative organism for malaria is a parasite known as *Plasmodium.* CISF personnel deployed in north eastern and malaria endemic areas are worst affected due to the nature of duties which exposes them to repeated mosquito bites. The malarial fever has high incidence during rainy season, coinciding with sowing and harvesting of agricultural produce etc. Although various measures of personal protection have been prescribed still cases of malaria keep coming due to reasons beyond human control. To combat malaria integrated approach is required both by individual members of the force as well as by administration.

Malarial parasite has four species namely *P.vivax, P.falciparum, P.malariae* and *P.ovale*. *Plasmodium vivax and Plasmodium falciparum malaria* are commonly reported in India. Inside the human body, the malarial parasite undergoes a series of changes as part of its life cycle in the liver and red blood cells. Man develops disease after 10 to 14 days of being bitten by an infective mosquito. Infection with *P.falciparum* is the most deadly form of malaria and is commonly called Brain Malaria.

SIGNS & SYMPTOMS OF MALARIA

Typically, malaria produces fever, headache, vomiting, joint pains, muscle cramps, tiredness, abdominal discomfort, diarrhoea, anemia, fits/ convulsions and loss of consciousness. Liver and spleen may become enlarged in malaria. Malaria in pregnancy is a risk to the mother and the newborn. In severe cases there may be high fever, prostration, altered consciousness, lethargy and coma. Patient is unable to drink due vomiting, urine is dark and there can be generalized fits.

SIGNS OF SEVERE AND COMPLICATED MALARIA

Cerebral malaria (Brain Malaria):

High fever, fits, patient may be in shock(Circulatory collapse) and unarousable (unconscious). There may be spontaneous bleeding, breathlessness, Kidney failure and marked fall in blood sugar level.

DIAGNOSIS

Confirmation of the diagnosis of malaria is by demonstration of malarial parasite in human blood.

MALARIA CONTROL STRATEGIES.

(A) **Hygiene & Sanitation**:

This comprises environmental management and source reduction methods. Conditions of human inhabitation is significant in the control of malaria. kuccha accommodation, tentage etc. are favourable for mosquito breeding and thereby transmission of malaria. Lack of proper bathrooms and toilets compels force personnel to go to jungles to attend the call of nature and exposing them to easy mosquito bites. Force members be provided proper accommodation as far as possible. In case of tentage accommodation improved drinking water and hygienic toilet facilities be provided.

(i) Source reduction i.e. regular area cleaning, treatment and abolition of mosquito breeding sites.

(ii) Proper covering of stored water.

(iii) Sprinkling of oil over stagnant water bodies.

(iv) Observence of a cleaning day once in a week and to remove stagnant water from all places.

(v) Use of hand held fogging machine for aerosol insecticide spray in camp areas.

(B) **Early detection and prompt treatment(EDPT)**:

(i) EDPT is the mainstay of malaria prevention and control.

(ii) In the endemic areas all cases of fever are assumed to be due to malaria and prompt treatment should be provided to them.

(iii)Force members often get mosquito bites in malaria prone areas and develop signs and symptoms of malaria later while on leave or temporary duty in non malarious region. In such situations the diagnosis may be missed due to commonality of signs and symptomps with other diseases. Therefore a pocket size MALARIA

CARD containing information about the nature and type of malaria in the region of deployment of force member and suggestion for treatment, may be introduced. Force members from malaria prone areas must keep this card all the time during leave or temporary duty period.

(iv) Now-a-days rapid diagnostic test facility is available and can be provided to even smaller contigents of CISF. It is an individual use test kit and any one can be easily trained to use it.

(v) Chloroquine is main antimalaria drug for uncomplicated malaria.

(vi) Alternate drugs for chloroquine resistant malaria are also available.

(C) **Vector (Mosquitoes) control** :

I – Chemical control

(i) Use of indoor residual spray with insecticides i.e. ……...

(ii) Use of chemical larvicides like Abate in potable water.

(iii) Aerosol space sprays during day time.

(iv) Malathion fogging during outbreaks.

II – Biological control

(i) Use of larvivorous fish in pond, ornamental tanks, fountains etc.

(ii) Use of biocides.

III – Personal protection

(i) Wearing clothes that cover maximum of body i.e. wearing of full pant and rolling down of sleeves from dusk to dawn.

(ii) Use of face-nets by jawans during night duty.

(iii) Screening of houses with wire mesh.

(iv) Use of mosquito repellent creams, liquids, coils, mats etc.

(v) Use of bednets treated with insecticide.

(vi) Of late alcohol consumption has been recognized as a cause of malaria transmission by virtue of neglect of personal protection measures thereby inviting mosquito bites. Alcohalics in some CPMFs are identified to suffer from recurrent malaria infection. Alcohol consumption in malaria endemic regions may be discouraged.

(D) **Awareness**:

(i) Some people harbour unreasonable notions that medicines for prophylaxis of malaria cause liver damage, impotency, cancer etc which are totally unfounded.

(ii) Frequent movement of forces in and out of endemic areas in short time intervals due administrative and operational contingencies results in deficient antimalarial measures.

(iii) Reporting of malaria cases be made a mandatory requirement. Earlier malaria deaths were considered as natural deaths specially during leave. Now the EOP rules provide for financial compensation in case of deaths due to malaria, hence all such cases should be meticulously reported.

(E) **Training** of paramedical, nursing, trained paramedics and select GD personnel on malaria control measures, use of rapid diagnostic test kit etc. with special emphasis for those who are deployed in malaria endemic regions.

PROPHYLAXIS

(i) For non-resistant cases: Chloroquine 300 mg(2 tab) weekly.

(ii) For Chloroquine resistant and P.Falciparum cases:

(a)Chloroquine 300 mg(2 tab) weekly with Proguanil 100 mg(1 tab) daily starting one week before entering endemic area and stopping one month after return from endemic area.

(b) Mefloquine 250 mg(1 tab) weekly starting one week before entering endemic area and stopping one month after return from endemic area.

(c) Doxycycline 100 mg(1 tab) daily starting one day before entering endemic area and stopping one month after return from endemic area.

(d) Primaquine 30mg(4 tab) daily starting one week before entering endemic area uptill a week after leaving.

PRECAUTION

(i) Drug should never be given empty stomach as it can cause abdominal cramps, nausea and vomiting.

(ii) Pregnant women should be given anti malarials with proper precaution and consultation with doctor.

(iii) Before giving the daily dose of primaquine check for presence of cyanosis (bluish coloration of gums and lips, nail tips etc.) or pink coloured urine. Glucose 6-phosphatase deficiency is excluded, before giving primaquine.

TREATMENT OF MALARIA (for Adult)

Early diagnosis is the key to effective management of malaria. In the endemic areas all cases of fever are assumed to be due to malaria and 600mg of Chloroquine in single dose for an adult and proportionate dose for children are administered orally. This is called *PRESUMPTIVE TREATMENT.* Simultaneously blood sample is taken to confirm the diagnosis and to determine the type of malaria. The aim of presumptive treatment is to relieve symptoms possibly due

to malaria and to reduce mortality and morbidity. Unless serious resistance to Chloroquine exists, a single dose can save lives in all types of malaria.

(I) **PRESUMPTIVE TREATMENT-**

(a) Low Risk Area : Chloroquine 600 mg (4 tablets) in single dose.

(b) High Risk Area: Chloroquine 600mg(10mg/Kg bw)+Primaqine… day-1
45 mg (0.75mg/Kg body wt)
Chloroquine 600mg(10mg/Kg body wt)… day-2
Chloroquine 300mg(5mg/Kg body wt)… day-3

(II) **RADICAL CURE** - If the blood sample is positive for malaria parasite, then following treatment is given: -

(a) **Low Risk Area**:

(i) P.Vivex malaria: Chloroquine 600 mg (4 tablets) and day-1
Primaquine 15 mg…
: Primaquine 15 mg daily… day-2 to day-5

(ii) P.Falciparum malaria (where Chloroquine 600 mg alone has been given for presumptive treatment): Chloroquine 600mg single dose with Primaquine 45mg single dose.

(b) **High Risk Area** (Pf. and drug resistance areas):

(i) P.vivax (if presumptive treatment as at I(b) above has been given):
: Primaquine 15mg daily for 5 days

(ii) P.falciparum: NO treatment if treatment at I(b) above is given.
(iii)P.falciparum resistant to Chloroquine:
: Sulfadoxine 500mg + Pyrimethamine 25mg combination 3 tab. as single dose followed by Primaquine 45mg.

(III) **SEVERE AND COMPLICATED MALARIA (CASES ARE TO BE HOSPTALISED)**

(a) Inj. Qunine 10mg/ kg body wt. in 5% dextrose saline over 4 hours : 8 hrly switched over to oral dose(10mg/kg bw) 8 hrly (not more than 2gm/day) as early as tolerable : Maximum duration 7 days total.
(b) Artemisinine derivatives :
(i) Artemisinin : 10 mg/kg bw at 0 & 4 hrs followed by 7 mg/kg bw at 24, 36, 48, and 60 hrs.
(ii) Artesunate : 2.4mg/kg bw IM/IV followed by1.2 mg/kg bw after 12 hrs. then 1.2 mg/kg bw once daily for next 4 days.
(iii) Artemether: 80mg(1.6mg/kg bw) IM daily total 6 doses.
or
80 mg(1.6mg/kg bw) IM twice daily for 3 days.
(iv)Artether : 150mg IM for 3 days.

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Drugs for Malaria
(Market names)

Sr. No.	Name of Drug	Market name
1	Chloroquine 250mg tab.	Lariago,Resochin,Nivaquine, Emquin
2	Proguanil 100mg tab.	Laveran,Progumal
3	Primaquine 7.5mg tab.	Malirid
4	Sulfadoxine 500mg+ Pyrimethamine 25mg tab.	Laridox,Malocide,Pyralfin,Reziz, Rimodar,Saligo
5	Doxycycline 100mg tab.	Doxt, Doxy-1,Monodox,Tpdox,Vibacin
6	Mefloquine 250mg tab.	Confal,Falcital,Mefliam,Mefloc,MQF
7	Quinine 300mg tab. 300mg/ml	Cinkona,Kwinil,Qinarsol,Tqnin Cinkona,Falquin,Kwinil, Qinarsol,Tqnin
8	Artesunate 50mg tab.	Artfin,Artidex,Benther,ErynateFalcigo, Falcicare,SunrikTesunate

	60mg/vial	Ardent,Artfin,Benther-AS,Falcigo,Falz, Lifart,Tesunate, Ulteria
9	Arteether 150mg/ 2ml Inj.	Aarnet,ARH,Artegen,artifact,Artirik, Artiz,E-mal,E-ther,Erod-M,Erythe r-β, Malino,Match, Rapither,Reether,Tpther
10	Artemether 40mg cap	Artimisa, Larither,Malither,Rmether, Methicap-40
	80 mg Inj.	Artimisa,Erythe r,Larither,Malither, Paluther,Rmether

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