Malaria

Malaria is an infectious disease caused by a parasite (called Plasmodium) transmitted by the bite of the *Anopheles* mosquito. There are five different types of which the widespread Malaria falciparum is the most dangerous. The incubation period – the time between an infecting bite and the appearance of the disease – varies from ten days to four weeks (rarely several months).

The symptoms include attacks of fever, headache and muscle pain but can initially be very similar to influenza. If adequate treatment is not started in time, an attack may sometimes result in death within a few days.

Where does malaria occur?

Malaria world distribution map

Malaria only occurs in tropical areas where *Anopheles* mosquitoes are present. From a height of 1,500 to 2,500 m onwards, depending on temperature and climate, *Anopheles* mosquitoes are either rare or non-existent. In most big cities there is little or no risk of infection, except in Africa where in most cities a real risk exists. Risk also exists in the suburbs of the big cities in Asia (e.g. in India). In a number of areas the risk varies strongly according to the season.

How can malaria be prevented?

Prevention against malaria is always a combination of different measures

1) Mosquito bite prevention:

The *Anopheles* mosquito only bites between dusk and dawn, is rather small and hardly makes any noise.

- Wear light-coloured cloths in the evening that covers your arms and legs as much as possible.
- Apply repellent cream on the unconvered parts of your body with:
  - DEET (20 to 50%, for children and pregnant women preferably 20 to 30%) e.g. Care-Plus® DEET, Moustimugâ, Z-stopâ, Anti-Mà, OTC-repellentâ etc. and repeat this every four to six hours (DEET 20-30% only gives protection for 4 to 6 hours, a higher percentage of DEET 40-50% will protect for 8 hours - this is not sufficient for the whole night!).
  - Citrodiol extracts of eucalyptus oil (Care-Plus® Natural, Mosegor®/Mosiguard®)
  - Picaridine (Care-Plus® Repel-It, Parazeet)
  - "Insect Repellent 3535" (Cinq sur Cinq Tropic®)
- other alternatives are not recommended for the moment.
- Sleep in mosquito-free rooms (mosquito nets on the sills, electrically-warmed anti-mosquito plates, airco does not always hamper mosquitoes from biting) or sleep under a mosquito net impregnated with insecticide (permethrine or deltamethrine) hung over the bed with the edges tucked under the mattress. If these measures are carried out correctly, the risk of malaria will be reduced by 80 to 90%.

2) Take malaria pills if indicated: The advantages and disadvantages of drugs and the real risk of malaria infection should be weighed off. These risks depend on the visited country, the region, the season, the duration of your stay and the accommodation. Different types of preventive malaria pills ("malaria prophylaxis") exist. Which drug suits best for you depends of different factors and should be discussed individually with a doctor. Possible side effects are usually mild, and only rarely it can be necessary to with to another type of medication. These drugs are very efficient and offer more than 95% protection if correctly taken.

Guidelines for preventive malaria pills (malaria prophylaxis)

For areas with resistance against chloroquine or fansidar (ZONE C on the malaria map):

ATOVAQUONE/PROGUANIL: for an adult: 1 tablet daily, starting 1 day before arrival in the malaria risk area until 7 days after leaving risk
The belief that “once malaria always malaria” is totally untrue.

DOXYCYCLINE: for an adult 1 tablet of 100 mg or ½ tablet of 200 mg daily, 1 day before arrival in the malaria risk area until 4 weeks after leaving risk area; doxycycline should be taken with plenty of liquid or during a meal. May be taken for several months. Doxycycline must not be given to children < 8 years and in exceptional cases, if no alternatives are available, to pregnant women during the first trimester of their pregnancy and to lactating women. Doxycycline can sometimes cause fungal infections of the mouth and the genitals and may give rise to phototoxic rash (sun allergy).

LARIAM®: 1 tablet per week, on a fixed day, during the evening meal, until 4 weeks after return for an adult; doxycycline should be taken preferably when switching from a different prophylaxis to Malarone during or after a stay in a malaria region (1 tablet of 100 mg or ½ tab. of 200 mg /day, to be started 1 day before departure until 4 weeks after return), to be discussed in case of high malaria risk.

If never taken previously and sufficient time before departure:
1. “Test tolerance”
= 1 tablet per week 2-4 weeks before departure
= at least 3-4 tablets before departure

2. Classic scheme
1. Take 1 tablet per week, at least 2 week(s) before departure or take 1 tablet per day during 2 days, at least 1 week before departure (medication build up) and then 1 tablet per week.
3. If taken previously and well tolerated and no time before departure, only in case of high malaria risk:
1. Take 1 tablet per day for 3 consecutive days just before departure (medication build up), and then 1 tablet per week

3. POSSIBLE ADVERSE EFFECTS:
1. The majority of people can take Lariam® without any problem
2. May be taken for many months
3. Stop taking this medication immediately and definitively in case of severe adverse effects!
4. Possible adverse effects:
   1. dizziness
   2. nightmares
   3. insomnia
   4. restlessness
   5. confusion
   6. headache
   7. shortness of breath
   8. unusual mood swings
   9. paranoia
   10. aggressive behaviour
   11. suicidal thoughts
   12. self-destructive behaviour
   13. psychosis
   14. hallucinations
   15. palpitation
   16. gastrointestinal complaints
5. 75% of the symptoms of intolerance occur after taking 3 tablets; 95% if 6 tablets are well tolerated; the risk of adverse effects decreases with the duration of tolerance. Delayed adverse effects are possible and can be related to stress, fatigue and/or insomnia.

6. Extremely rare: epilepsy, hallucination (1/10.000)

7. Because these adverse effects may appear very gradually, they often noticed relatively late - be aware of this.
Consider stopping Lariam® if too troublesome and switch to another prophylaxis. In case of side effects, discuss this as soon as possible with your treating doctor OR with an experienced doctor OR (when prescribed at the ITM), send a mail to communicatie@itg.be and put "Lariam" in the title.

4. ALTERNATIVES:
1. Atovaquone/Proguanil: 1 tablet per day. When switching from a different prophylaxis to Malarone during or after a stay in a malaria region (or when one has forgotten to take 1 or 2 pills), Malarone should always be continued until at least 4 weeks after the switch - this means Atovaquone/Proguanil sometimes must be taken longer than the prescribed 7 days after leaving the malaria area:
   2. Switch < 3 weeks before departure: once daily for the rest of the stay – until 7 days after leaving the risk area
   3. Switch after departure (=after leaving the risk area); once daily for another 4 weeks

   Atovaquone/Proguanil has an efficiency of > 95% and can easily be used during several months (taking into consideration the high price).

2. Doxycycline (1 tablet of 100 mg or ½ tab. of 200 mg/day, to be started 1 day before departure until 4 weeks after return), to be discussed with the doctor. Not for children under the age of 8 years. Doxycycline may be administered in exceptional cases, if no alternatives are available, to pregnant women during the first trimester of their pregnancy and to lactating women. Doxycycline should be taken in a sitting position, with plenty of liquid, or during the meal (ulcer in the oesophagus). Can cause fungal infections of the mouth and the genitals and photosensitivity (excessive skin reaction after sun exposure).

   Doxycycline is > 95 % effective and can be taken for several months.

These medications are only available on doctor’s prescription.

No drug offers 100% protection, so if fever occurs within the first three months after your return from the tropics, one should think of malaria and seek immediately competent medical aid. However, it is reassuring to know that malaria, provided it is recognised in time, is easy to treat without any danger of recurrent attacks. The belief that "once malaria always malaria" is totally untrue.