

FREQUENTLY ASKED QUESTIONS: MALARIA

ARE THERE DIFFERENT KINDS OF MALARIA?

Yes, there are five types of human malaria namely falciparum, vivax, ovale, malariae and knowlesi.

All malaras are found in the Asia-Pacific region though ovale, malariae and knowlesi are relatively rare.

Falciparum malaria is the most dangerous form of the disease. It is the most common form in sub-Saharan Africa but it is also found in considerable numbers in the Asia-Pacific. Vivax malaria is however the most common strain of the disease in the Asia-Pacific.

Knowlesi malaria (usually a disease of monkeys) is rarely seen in humans, to date only in specific parts of South East Asia.

ARE ALL TYPES OF MALARIA SERIOUS?

Falciparum malaria is the most serious common form of the disease and is often life threatening in non-immune people. Knowlesi malaria is also very serious and should be treated as falciparum, though it is rare and only seen in specific areas of South East Asia.

Vivax malaria is not usually life-threatening though it can cause severe illness and death.

Ovale and malariae are not life threatening but they do cause unpleasant illness, making people feel unwell enough to have to stay in bed for a number of days.

OTHER THAN BEING BITTEN BY A MOSQUITO, HOW ELSE CAN I GET MALARIA?

Almost all malaria cases are a result of being bitten by an infective mosquito. In a small number of cases each year, malaria is also transmitted through infected blood transfusions. In rare cases it can be passed from mother to foetus during pregnancy or childbirth.

HOW LONG AFTER BEING BITTEN CAN IT TAKE FOR MALARIA TO APPEAR?

Most people will fall ill within 7 to 30 days of receiving an infected bite. The shorter periods are usually associated with *falciparum malaria* and the longer ones with *malariae malaria*. However, antimalarial prophylaxis can delay the appearance of malaria symptoms by weeks or months so symptoms can appear long after a person has left the malaria-endemic area (particularly in the cases of *vivax* and *ovale* malaria due to their ability to lie dormant in the liver). Returned travellers should therefore always remind their health-care providers of any travel to malaria endemic areas.

CAN MALARIA RECUR LATER?

Once a malaria patient has been treated and recovered there are possible reasons why the disease may recur later:

- ⇒ The initial infection may not have been fully treated and may have just been suppressed. It could then resurge later causing another episode of illness. This will normally happen within a week or two.
- ⇒ *Vivax* and *ovale* malaria have a form of the parasite which can lie dormant in the liver. With these types of malaria there is an initial period of illness that may be treated and cured, but the dormant stage may still be present. The dormant stage can then emerge into the blood stream several months, or occasionally, several years later. These malarias can be completely cured and removed from the liver by treatment with 'radical cure' drugs. The most commonly used drug for this is primaquine.
- ⇒ Some types of chemoprophylaxis are not fully effective against vivax or ovale malaria. People taking this type of prophylaxis who become infected may never experience an initial illness but may still harbour the dormant liver stages of the disease. The active blood stages of the infection can then relapse months or possibly even years after prophylaxis is stopped.

HOW FAR DO MOSQUITOES TRAVEL?

Most mosquito species generally only have a maximum flight range of around 2km and usually fly much shorter distances if food and breeding sites are available locally. Some species have longer flight ranges and all species can travel considerably further if taken by the wind, or inadvertently carried by a vehicle.

WILL THERE BE A MALARIA VACCINE SOON?

There are currently no commercially available malaria vaccines.

A number of vaccine candidates for falciparum malaria are currently being developed or trialled. The most advanced – RTS,S, could be used operationally in the medium term (WHO predicts making a policy recommendation in 2015)¹. However, RTS,S has been designed to vaccinate children living in highly endemic areas. It will not be appropriate as a vaccine for international travellers and there are at present no vaccines in the later stages of development that would be appropriate for this target group.

There is currently no vaccine candidate being trialled for use in the Asian setting.

There are currently no vaccine candidates for any other species of malaria.

AREN'T UNTREATED NETS JUST AS GOOD AS TREATED NETS? WHAT IS THE ADDED ADVANTAGE OF INSECTICIDE?

While untreated nets certainly provide some protection, treated nets are proven to offer twice as much protection from malaria as untreated nets. Nets treated with insecticide stop mosquitoes from biting through the net and mosquitoes are less likely to find their way under the net or through small holes.

HOW SAFE IS THE INSECTICIDE ON THE NETS?

Only one class of insecticides, the 'pyrethroids', is registered by the World Health Organisation as safe to put on mosquito nets. This is because extensive safety testing has

¹ <http://www.who.int/malaria/areas/vaccine/en/>

been done on this class of insecticide to ensure they are safe for people to sleep under. The safety testing showed that the amount of insecticide needed to cause harm was far above the amount used to treat one net. This means that everyone can safely sleep under an insecticide treated net. Some people experience short-term minor irritations from new or freshly treated nets. This can include experiences such as itching, tingling skin or sneezing. This is relatively common in people handling new nets out of the bag or freshly treated nets. However these side effects are not bad for your health.

DO AIR CONDITIONERS AND FANS STOP MOSQUITOES FROM BITING?

Air conditioners do prevent some mosquito biting as mosquitoes are less active in cooler temperatures. However the main protection comes from the fact that air conditioners are normally in place in well-sealed rooms, meaning there may be fewer mosquitoes in the room. Fans also reduce mosquito biting to some extent if you are sleeping directly under the air movement. However, neither of these is effective enough to rely on as a protective measure in areas where malaria is a problem.

HOW EFFECTIVE IS CHEMOPROPHYLAXIS?

No malaria chemoprophylaxis gives complete protection and this is important to note as ensuring you protect yourself from mosquito bites remains important. However, the medication is extremely effective and, as a rule provides about 95% protection from fatal disease. The amount of protection you will get depends on how regularly you are taking the medication, whether you miss doses, and how well your body absorbs the drug. The World Health Organisation which monitors malaria cases each year notes that: **“most *falciparum* malaria cases in non-immune travellers each year occur because of poor adherence to or complete failure to use, chemoprophylactic drugs”**

HOW DO THE DRUGS WORK?

The different drugs, be they for chemoprophylaxis or treatment, work at different points in the parasites life-cycle. Some attack the blood stages of the malaria parasite, others attack the liver stages of the malaria parasite, and some attack both. They attack the parasite in different ways, for example some block the malaria's self-detoxifying process, and some block its cell respiration process.

All of the drugs work to destroy the parasites in the infected person by preventing them from multiplying. The drugs stop parasites from multiplying and existing ones die. For treatment this means that over the course of around 7 days or less the treatment will have eradicated the parasites from the body.

With chemoprophylaxis the parasites are never able to get well established in the body because the high levels of the drug in the blood stream prevent the initial multiplication within the blood. *Some drugs used for prophylaxis are not able to destroy the dormant liver stages of the parasite found in vivax and ovale infections.*

Some of the drugs that are used for treatment of severe malaria, rather than chemoprophylaxis, work in a slightly different way. They prevent parasites from maturing into the more dangerous stages that can cause coma and organ failure while at the same time removing parasites from the body.

DOESN'T CHEMOPROPHYLAXIS JUST REDUCE THE NUMBER OF PARASITES IN THE BLOOD – SO YOU ONLY NOTICE SYMPTOMS LATER LEADING TO DELAYED TREATMENT AND MORE PROBLEMS?

When the chemoprophylaxis is working, it does not just reduce the number of parasites in the blood, but removes them entirely. If you are unfortunate and get a break-through infection, perhaps because the malaria is developing some resistance to that drug, then it may fail to prevent the malaria parasites from spreading and multiplying in the body. In this case the development of the illness will be slowed down but will continue to progress as the malaria continues to multiply in your body slowly. Symptoms will appear later than with an infection in someone **not** taking chemoprophylaxis but this is a good thing; this is because the whole disease itself is developing more slowly in your body. This means you have longer to react and seek treatment.

HOW LONG CAN YOU TAKE CHEMOPROPHYLAXIS FOR?

Recommendations on how long to take chemoprophylaxis for vary from country to country and should be tailored to suit a patient's individual circumstances by a doctor. For instance, UK product licensees indicate that mefloquine (Larium) can be taken continuously for a period of up to 12 months, doxycycline can be used for up to 6 months, and atovaquone-proguanil (Malarone/Malanil) can be used for from 9 to 34 weeks without experiencing adverse effects. Nevertheless, long-term use of any drug should be prescribed with careful consideration. Prescriptions and experiences should be reviewed with a medical practitioner intermittently.

WHAT SIDE EFFECTS DOES CHEMOPROPHYLAXIS HAVE?

All drugs have some possible side effects. Serious side effects are rare; minor side effects are far more common but are often so mild that they do not affect the activities of the traveller. Each malaria drug is contraindicated (not recommended) for some groups of people and this guidance should be carefully followed to avoid serious side effects in these groups. The most common side effects include:

- ⇒ Atovaquone-proguanil: abdominal pain, nausea, vomiting and headache.
- ⇒ Doxycycline: photosensitivity, nausea, vomiting and vaginal yeast infections.
- ⇒ Mefloquine: psychoses, seizures (these are very rare), gastrointestinal disturbance, headache, insomnia, abnormal dreams, visual disturbances, depression, anxiety disorder, dizziness, tingling, numb skin, tremor, agitation or restlessness, mood changes, panic attacks, forgetfulness, confusion, hallucinations, aggression and paranoia

Anyone who develops serious side effects, particularly serious neurological or psychological disturbances after taking mefloquine (Larium), should stop taking the drug and seek medical advice. This is one of the reasons why it is important to take Larium for 2-3 weeks before travelling. This allows doctors to determine if a different option is going to be needed. Mild nausea, occasional vomiting or loose stools should not prompt discontinuation of prophylaxis, but medical advice should be sought if symptoms persist.

It is important to note that these side effects are on the whole rare. The potential side effects (barring people with specific medical issues) do not warrant avoiding chemoprophylaxis in preference to waiting until you get malaria and then treating it. It is not safe to assume that any malaria infection will be successfully treated.

IF YOU TRAVEL LAST MINUTE IS IT OK TO START TAKING THE MEDICATION 1 DAY BEFORE YOU TRAVEL OR EVEN ONCE YOU ARRIVE?

The best protection is given when you take the drugs for the recommended time before travelling (this timing depends on the type of drug). For atovoquone-proguanil you only need to take it 2-3 days before travelling to have the best protection. However, yes, it is always worth starting the medication whenever you can, even if you are already in the malarial areas. You will still get some protection from it though you must be aware that the initial protection will not be nearly as good as if you had started at the recommended time. If you have started it late then protecting yourself from mosquito bites is even more of a priority than normal.

HOW QUICKLY DOES MALARIA INFECTION PROGRESS?

Once you are bitten by an infective mosquito there will be a period of delay before you fall ill. During this time the malaria parasite is developing in the liver. Once it emerges from the liver and starts circulating in your blood stream you will start to feel unwell. This is normally within a couple of weeks after being bitten, but can be up to a few months or even years in certain circumstances. Initial symptoms may be very vague and flu-like including lethargy, aching muscles, headache and then fever and chills. Often these relatively mild symptoms persist for a couple of days before becoming more serious, however the progression can be much faster with severe malaria and possibly cerebral complications developing within 24 hours of initial symptoms. This is why it is very important to act quickly.

DO TESTS TELL YOU WHICH MALARIA YOU HAVE?

You can test for malaria by having a drop of blood from a finger prick examined by a skilled microscopist or tested with a rapid diagnostic test (RDT).

Microscopy can tell you what kind of malaria you are infected with and how many parasites there are in your blood. Rapid tests come in different types. Some only tell you if you have *falciparum* malaria. Others tell you if you have *falciparum* malaria or one of the other types. The sensitivity and specificity of most RDTs is high (and steadily improving) but for the time being at least, microscopy in the hands of a skilled technician is still more reliable if the number of parasites in the blood is low.

CAN I JUST TREAT MYSELF FOR MALARIA?

Recommendations for emergency self-treatment from the World Health Organization are given below:

- ⇒ Take medical advice on the appropriate drug to take along with you as stand-by emergency treatment.
- ⇒ Consult a physician immediately if fever occurs 1 week or more after entering an area with malaria risk.
- ⇒ If it is impossible to consult a physician and/or establish a diagnosis within 24 hours of the onset of fever, start the stand-by emergency treatment and seek medical care as soon as possible for complete evaluation and to exclude other serious causes of fever. This is important as the drug you are taking may fail and you may need a second line treatment.

- ⇒ Do not treat suspected malaria with the same drugs used for prophylaxis; if the infection has broken through the chemoprophylaxis it may be because of tolerance to that drug and a different drug should be used for treatment.
- ⇒ Vomiting of antimalarial drugs is less likely if fever is first lowered with antipyretics (e.g. paracetamol). A second full dose should be taken if vomiting occurs within 30 minutes of taking the drug. If vomiting occurs 30–60 minutes after a dose, an additional half-dose should be taken. Vomiting with diarrhoea may lead to treatment failure because of poor drug absorption.
- ⇒ Complete the stand-by treatment course and resume antimalarial prophylaxis 1 week after the *first* treatment dose. To reduce the risk of drug interactions, at least 12 hours should elapse between the *last* treatment dose of quinine and resumption of mefloquine prophylaxis.

Medical advice should be sought in all cases of suspected malaria illness.

CAN YOU USE CHEMOPROPHYLAXIS MEDICINES FOR TREATMENT?

Yes, all the preventative medicines can theoretically be used for treatment but there are a few important points:

- ⇒ The doses used for chemoprophylaxis and for treatment are very different. It is vital to get medical advice on the appropriate treatment dose.
- ⇒ If a breakthrough case of malaria occurs when someone is on chemoprophylaxis, it may be because the parasite is tolerant to the drug being used. It is therefore important that a different drug is used to treat the case.
- ⇒ The drug provided for standby emergency treatment should be different from the drug being used for chemoprophylaxis.

Medical advice should be sought in all cases of a suspected malaria illness.

CAN YOU EVER GET BETTER FROM MALARIA WITHOUT TREATMENT?

People who have grown up in areas with a lot of malaria and stay in these areas develop some immunity to the disease. This partial immunity means that they may get ill with malaria a couple of times a year but not seriously so. Sometimes these malaria episodes will need treatment while others may resolve themselves without treatment.

Non-immune people are those people who did not grow up in a malaria-endemic area or people who did grow up in these areas but moved away for around 6 months to a year or more. In this group every *falciparum* malaria infection will cause serious illness and need urgent treatment.

WHAT OTHER DISEASES DO MOSQUITOES SPREAD?

Different groups of mosquito species spread different diseases:

- ⇒ Anopheles mosquitoes: malaria, lymphatic filariasis (also known as elephantiasis is a public health problem for people who have been living for many years in endemic areas but is not of concern for travellers).
- ⇒ Culex mosquitoes: Lymphatic filariasis, Japanese encephalitis, other viral diseases.
- ⇒ Aedes mosquitoes: Yellow Fever, dengue, dengue haemorrhagic fever, other viral diseases, lymphatic filariasis.