Malaria

Malaria is a very serious infection which results from a bite from an infected mosquito. The most common symptoms are high temperature (fever) and a flu-like illness. The symptoms of malaria can occur up to a year after being bitten in an area in which malaria is present. Prompt treatment for malaria is essential as, without treatment, it can be fatal. This leaflet gives general information about malaria and its treatment.

What is malaria?

Malaria is a serious infection. It is common in tropical countries such as parts of Africa, Asia and South America. It is caused by a parasite called plasmodium. A parasite is an organism that lives on an animal and feeds from it. The parasite is passed to humans from a mosquito bite.

There are five main types of malaria parasite (plasmodium) that cause the disease. These are called Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, Plasmodium malariae and Plasmodium knowlesi. Plasmodium falciparum is usually the most serious. Occasionally people have infection with more than one type.

Malaria symptoms

Symptoms may include:

A very high temperature (fever). There may be sweats or shivering. This is a common symptom but a normal temperature does not rule out the possibility of malaria.

- Headaches.
- Tiredness.
- Loss of appetite.
- Tummy upsets such as feeling or being sick, having diarrhoea or tummy pains.
- Sore throat.
- Coughing.
- Feeling out of breath.
- Joint or muscle pains.
- Confusion.

Symptoms usually occur between one to eight weeks after the initial mosquito bite. (This is the incubation period.) However, in some cases, depending on the type of plasmodium causing the infection, it can take up to a year before any symptoms start to show. The illness may start off with nonspecific flu-like symptoms.

There are two general types of malaria: uncomplicated and severe (complicated). Severe or complicated malaria is more serious and difficult to treat and is more likely to be life-threatening.

Uncomplicated malaria

Any of the symptoms above may occur. The fever in most people has no specific pattern and may present 1-2 days after the symptoms start. If the malarial infection becomes established then symptoms can come in cycles, occurring every 2-3 days.

Severe (complicated) malaria

The more severe condition occurs when complications develop. It is most commonly caused by Plasmodium falciparum. It usually begins with similar

symptoms to uncomplicated malaria, but serious problems in various body organs or systems develop, including:

- Cerebral malaria: the brain or nervous system is affected. There may be lower levels of consciousness, coma or fits (seizures).
- Kidney or liver problems.
- Serious breathing problems.
- Low sugar levels.
- Very low blood pressure.
- Sepsis.
- Anaemia.
- Abnormalities of blood clotting.

Note: pregnant women are at particular risk of severe symptoms and should, ideally, avoid going to risk areas. This is because the immune system's response to malaria weakens during pregnancy. Women who are pregnant and have malaria may pass the infection on to their baby which can cause serious illness or death.

Others who are more likely to get the severe form of the condition include elderly people, children, those with untreated HIV/AIDS and other people whose immune systems are not working normally (for example, when being treated with chemotherapy).

How is malaria spread?

The plasmodium parasite is usually transmitted by a particular species of mosquito called the anopheles mosquito. If a female anopheles mosquito bites a person who is infected with malaria, the mosquito can then carry the plasmodium parasite and spread it to others when it bites and feeds from other people's blood.

When the plasmodium parasite enters the blood, it travels to the liver and then re-enters the bloodstream where it can invade the red blood cells. Eventually, these infected red blood cells burst which leads to them releasing even more of the tiny parasites into the blood.

These infected red blood cells tend to burst every 48-72 hours. Each time they burst, this may cause an episode of chills, high temperature (fever) and sweating.

How common is malaria?

It has been estimated that worldwide there were 247 million cases and 619,000 deaths from malaria in 2021. The numbers of deaths had steadily decreased since 2000 but has increased again since 2020.

The disease is uncommon in the UK. It is very rare to develop malaria in the UK as the mosquitoes which transmit it cannot thrive in the UK climate. People who have or develop malaria in the UK have usually been bitten by an infected mosquito in another country where malaria is prevalent. This is called imported malaria.

Most infections diagnosed in the UK occur in travellers returning to the UK (rather than visitors coming to the UK). A total of 1,012 cases of imported malaria (and three deaths from the infection) were reported in the UK in 2021. The average number of deaths in the UK has been six deaths per year for the last twenty years. Most cases were caused by Plasmodium falciparum.

Areas where malaria is common are in the tropical or subtropical parts of the world. This includes most of Africa, Asia, and significant parts of South America. It is not generally a risk in Western Europe, the USA, Australia or New Zealand.

The risk of getting the disease is greatest if not taking antimalarial medication properly or at all. People taking last-minute holidays and also those visiting friends or relatives abroad have been shown to be the least likely to take antimalarial medication.

Note: malaria can kill people very quickly if it is not diagnosed promptly. If you feel unwell and have recently visited an area known to be affected, you should seek prompt medical advice, even if you have taken your antimalarial medication correctly.

How is malaria diagnosed?

If malaria is suspected then medical advice needs to be sought without delay. Anyone who has travelled in the previous year to an area in which there is malaria may be at risk of this disease, even if they took antimalarial medication whilst abroad. Usually a doctor will immediately refer to a hospital or Infectious Disease Unit for rapid testing if this is the suspected diagnosis.

A doctor will organise a blood test. The blood sample will be sent to the laboratory and will be examined for the presence of the plasmodium parasite. The type of plasmodium causing the infection will also be determined. If the first blood test is negative but there is strong suspicion of malaria then another blood test taken a couple of days later might be recommended.

Malaria treatment

If malaria is promptly diagnosed and treated, most people make a full recovery. Treatment is with antimalarial medicines. A number of these are available including:

- Artemisinin combination therapy (ACT) This is usually artemether-lumefantrine (Riamet®) or dihydroartemisinin-piperaquine (Eurartesim®).
- Quinine.
- Quinine with doxycycline.
- Atovaquone-proguanil (Malarone®).
- Chloroquine.
- Artesunate.
- Primaquine.
- The type of medicine prescribed and the duration of treatment can vary from person to person. It depends on various factors such as:
- The type of plasmodium infection.
- If any antimalarial medication was taken whilst travelling.
- The severity of symptoms.

Mild symptoms can be treated at home. However, with the Plasmodium falciparum type or in pregnancy then it is very likely that treatment and monitoring would be in hospital. This would also be needed if there are complications or for children or elderly people.

Some people are given more than one type of medication or an alternative medication if they develop side-effects to a medication. Resistance to antimalarial medicines has become a problem and this means that newer medicines or a combination of medicines may be given.

If the first antimalarial medicine prescribed fails to improve symptoms, a variety of other medicines might need to be tried as part of the treatment. Treatment for malaria can cause people to feel weak and tired for several weeks afterwards.

Other advice after a diagnosis of malaria:

- The infection will be reported to Public Health England as it is a notifiable disease, meaning doctors are obliged to report all cases.
- Others who travelled with the person with malaria (if you caught malaria whilst travelling) should be warned to urgently report any symptoms of illness to a health care professional.

- After treatment, it is possible to have a relapse. If this occurs further treatment may be required.
- Having had malaria does not lead to immunity from getting it again so precautions still need to be taken if travelling to areas where malaria is known to be found.
- Blood cannot be donated for some time after having this disease. Regular blood donors would need to inform the blood donation service of their diagnosis.

How can malaria be prevented?

There are a number of things that can protect from malaria. These include taking the malaria prophylaxis exactly as recommended and also trying to avoid being bitten by using insect repellent, wearing long sleeves and trousers and by using mosquito nets. See the separate leaflet called Malaria Prevention.