Travel to malaria areas. What’s the fuss about the buzz?

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Introduction

Malaria is prevalent in many tropical and subtropical areas and is both preventable and treatable. However, malaria can be a life-threatening disease if not diagnosed and treated early.

Malaria is derived from two Italian words ‘mal’ (bad) and ‘aria’ (air). Initially, it was thought that the air around salt marshes played a role in how the disease was spread, hence the name malaria.

Although there have been reports of malaria in Chinese medical texts dating as far back as 2 700 BC, the Plasmodium parasites were only identified in 1880, and 17 years later the role of the mosquito in transmitting malaria was discovered.

On the African continent, malaria is mainly caused by Plasmodium falciparum parasites, which are the most dangerous type and are globally responsible for most malaria-related deaths. Although human malaria can be caused by different species of Plasmodium parasites, this article will only be focusing on P. falciparum malaria.

The role of the mosquito

Malaria is an acute febrile disease caused by Plasmodium parasites. The life-cycle of the malaria parasites involves two hosts, the mosquito and the human. See Figure 1. The parasites are spread to humans by the bite of an infected female Anopheles mosquito, which feeds mainly between dusk and dawn. The male Anopheles mosquitoes do not play a role in the spread of malaria as they don’t feed on blood.

Malaria life cycle

Figure 1. Life-cycle of malaria parasites. Adapted from: Image 1. Hill AVS. Vaccines against malaria. Philosophical transactions B. Sept 2011. http://rstb.royalsocietypublishing.org/content/366/1579/2806.short
Malaria symptoms

The first symptoms of malaria are non-specific and include a sudden onset of fever and flu-like symptoms. Other symptoms in adults include cold shivers, sweating, headaches, muscular aches and weakness, coughing, vomiting, diarrhoea and abdominal pain. Young children may not present the same way and the most common symptoms in young children are fever, poor feeding, vomiting, diarrhoea, cough and lethargy.

The incubation period is at least seven days and symptoms usually appear 10–15 days after being bitten by an infected mosquito. Falciparum malaria can develop into severe illness or death, if not treated within 24 hours.

Persons at risk of severe malaria

If possible, people at increased risk of developing serious illness should avoid travelling to high-risk malaria areas.

The following people are at particularly high-risk of developing serious illness:

• Pregnant women
• Infants and young children (under the age of five years)
• Elderly persons (over 60 years of age)
• Persons with a weakened immune system (i.e., persons living with HIV/AIDS or persons undergoing chemotherapy)
• Persons without a spleen

Note: Persons living in low-risk malaria areas are not immune to malaria and are also at risk of contracting malaria and developing severe disease.

Malaria areas

The risk for malaria varies from country to country and even amongst different areas within a country. According to the World Health Organization (WHO), there are currently 91 countries around the world (mainly in Africa, Asia and the Americas) where travellers could be at risk of malaria infection.

The risk may also fluctuate from season to season, being the highest soon after the start of or at the end of the rainy season. Altitude also plays a role with the risk being lower at altitudes above 1 500 m. However, malaria can be contracted at altitudes up to nearly 3 000 m in favourable climatic conditions.

Figure 2 shows endemic areas in South Africa. Malaria mainly occurs in the low altitude areas of Limpopo, Mpumalanga and northern KwaZulu-Natal provinces and the risk for malaria transmission is the highest during the wet summer months (September to May).

However, the infected mosquitoes can occasionally (very rarely) be transported in vehicles and suitcases from an endemic area to a no-risk area; this is known as Odyssean malaria. People with unexplained fever should therefore be
tested for malaria even if they have not travelled to an area where there is a risk of malaria.

**Prevention**

Pharmacist’s assistants are in a unique position to advise those who are planning to travel to an area where there is a risk of malaria on measures to prevent mosquito bites as well as on the importance of appropriate chemoprophylaxis.

**Preventing mosquito bites**

The first-line of defence is to prevent being bitten. The female *Anopheles* mosquito bites during dusk and dawn and the following measures can be taken to prevent being bitten:

- If possible, stay indoors between dusk and dawn.
- Cover windows and doors with mosquito screens, especially in malaria-endemic areas.
- Wear long-sleeved clothing (if possible light-coloured), long trousers and socks if outside between dusk and dawn. Mosquitoes are inclined to bite below the waist, mostly below the knees. By wearing long trousers and shirts, one can reduce the amount of exposed skin.
- Apply mosquito repellents to exposed skin surfaces, especially during dusk and dawn. Effective mosquito repellents such as those containing 20–50% N,N-diethyl-m-toluamide (DEET) are recommended for adults and children aged two months and older. Depending on the product used, it should be reapplied every four to six hours as well as after bathing and showering. Care should be taken to avoid the mouth, eyes, mucous membranes, sensitive, sunburned or damaged skin or deep skin folds.
- Use vapourisation mats and mosquito coils indoors.
- Sleep under bed nets impregnated with insecticides (pyrethroids such as permethrin).
- Use air-conditioners or ceiling fans; this disturbs the mosquito while they are trying to feed.
- Apply permethrin, which is both an insecticide and repellent, to clothes and to mosquito nets, but not to skin.

**Chemoprophylaxis**

For chemoprophylaxis, the patients should be referred to the pharmacist or doctor for individual assessment. The most suitable product would depend on geographic region, the availability of antimalarials, antimalarial drug resistance, duration of stay, individual patient factors as well as the product considered to be best tolerated for optimal compliance.

Antimalarial medicines such as mefloquine, doxycycline or atovaquone-proguanil can be used to prevent malaria. These products are considered to be equally effective if taken correctly. Products containing mefloquine or atovaquone-proguanil are currently only available on prescription. However, doxycycline is available as a S2 product “S2 Doxycycline - when intended and labelled for the chemoprophylaxis of malaria in those aged 8 years and older, for periods not exceeding 4 months of continuous use; (S4)...”

“IIt is of utmost importance to take malaria prophylaxis correctly and for the right length of time”

Doxycycline prophylaxis needs to be started one day before travel; it should be taken daily while in the area and continued daily for four weeks after returning. It is an ideal product to use for those ‘last minute travellers’. However, it may not be suitable for all travellers and it is contraindicated in pregnant women and in children eight years of age or younger. Please refer the patient to the pharmacist for additional information regarding dosing, possible adverse effects, precautions, contraindications and interactions.

Advice for people taking malaria prophylaxis:

- It is of utmost importance to take malaria prophylaxis correctly and for the right length of time.
- Start taking malaria prophylaxis before entering a malaria area. Depending on the product, malaria prophylaxis may need to be started at least one week before entering a malaria area (i.e. mefloquine).
- The course should be completed after leaving a malaria area (duration would depend on the product used).

Those taking chemoprophylaxis should be warned that chemoprophylaxis is not always 100% effective and that it is still possible to contract malaria. Anyone who develops fever or flu-like symptoms seven or more days (within three months) after entering a malaria area should consult a doctor for urgent evaluation (so that malaria can be either excluded or treated).

**Summary**

More than half the world’s population remain at risk of malaria, despite continued implementation of effective interventions. Pharmacist’s assistants are in a unique position to advise patients travelling to high-risk malaria areas on how they can minimise their risk. The five principles of malaria protection (“ABCDE”) are:

- Be Aware of the risk, incubation period and main symptoms of malaria.
- Avoid mosquito Bites, especially during dusk and dawn, even when taking malaria prophylaxis. Avoid outdoor activities (especially during dusk and dawn) in environments where mosquitoes breed i.e. swamps and marshy areas.
- Use Chemoprophylaxis, when appropriate, at the correct interval and for the right length of time.
- Seek early Diagnosis; the initial symptoms of malaria may be mild and difficult to recognise as malaria. It is therefore important for individuals who have travelled to a malaria area to go to the doctor if they are experiencing flu-like symptoms at any time between seven days after the first possible exposure and three months (or rarely, later) after the last possible exposure; even if they have been using malaria chemoprophylaxis.
• Early detection and Effective medical treatment can be life-saving.

Bibliography


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