Preventing malaria in travellers: an overview

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Nurses have an essential role in advising travellers about the risks of contracting malaria, how to prevent it and how to recognise the symptoms

TRAVEL HEALTH PART 3 OF 3

In this article...
- Causes of malaria
- The ABCD of malaria prevention
- Useful resources for nurses on malaria

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Malaria is caused by the parasite Plasmodium. This is spread by female Anopheles mosquitoes, which bite from dusk to dawn. Five types of the parasite can infect humans: P falciparum, P vivax, P ovale, P malariae and P knowlesi (the last is usually found in monkeys and is rare in humans). All types of malaria can cause debilitating symptoms, but P falciparum malaria can rapidly lead to serious complications, including cerebral manifestations, coma and death.

The life cycle of malaria parasites is complex and differs depending on the type of infection. An understanding of the parasite’s life cycle is necessary to understand both how the infection manifests and the way in which malaria prevention and treatment work at the different stages of the parasite’s life cycle.

Symptoms can appear as early as eight days after an infected bite for P falciparum or can take several months to present in P vivax (Field et al, 2010). Diagrams illustrating the life cycle of the malaria parasite are available (Box 1 contains resources).

Where is malaria found?
Malaria is found in more than 100 countries. The World Health Organization (2011) estimates that 125 million travellers visit these countries every year. In 2010, 1,761 cases of malaria were reported in the UK and seven of these were fatal (Health Protection Agency, 2011).

Fig 1 shows malaria risk areas. P falciparum is more common in sub-Saharan Africa and P vivax is more common in south Asia.

Advising travellers
The ABCD of malaria prevention is the basis of pre-travel malaria advice (Chiodini et al, 2007a):
- Awareness of risk;
- Bite prevention;
- Chemoprophylaxis;
- Diagnosis.

Awareness of risk
Travellers must be aware of their risk of contracting malaria if they are planning to visit malarial areas. As the infection is not found in this country, UK travellers may not realise how dangerous it is.

Most malaria in UK travellers is diagnosed in people who have visited friends and relatives (often called VFR travellers) in Africa or Asia (HPA, 2011). These
travellers may underestimate their risk of malaria or incorrectly think they are naturally immune.

Travellers at high risk of serious complications of malaria include pregnant women, babies and young children, and those with immune suppression, asplenia (no spleen) or splenic dysfunction (Chiodini et al, 2007a) (see last week’s issue for more information on special risks: Wong et al, 2012). People in these groups who are determined to travel, despite being aware of their greater risk of serious complications, should be advised that scrupulous bite avoidance measures and adherence to antimalarial drugs are vital.

The WHO (2011) advised that because of the risk to mother and baby, pregnant women (particularly in the first trimester) should ideally avoid travel to areas where chloroquine-resistant P falciparum occurs. Nurses should seek specialist advice when advising these travellers (Box 1).

**Bite avoidance**

Anopheles mosquitoes bite from dusk to dawn. Since no antimalarial tablet is 100% effective, travellers must be advised about the importance of insect bite avoidance:

- Insect repellents containing up to 50% concentration of N, N-diethyl-meta-toluamide (DEET) are safe to use directly on skin. This includes in pregnancy, during breastfeeding and for babies older than two months.
- Manufacturers’ guidelines should be followed carefully. Avoid getting repellent in the eyes, mouth or nose; travellers should be advised to use their hands to spread it on the face rather than applying it directly. Particular care should be taken when applying repellents to children;
- Wearing long-sleeved clothes and trousers, especially in the evenings, helps to protect against mosquito bites. Clothing can be treated with specially formulated insecticides and repellents (including 100% DEET);
- Those staying in accommodation without effective air conditioning and screening on the doors and windows should sleep under an intact mosquito net that has been pre-soaked with permethrin insecticide. These can be bought from specialist travel companies and large pharmacies. Using bath oils, electronic buzzers or essential oils, eating garlic or yeast extracts such as Marmite or taking vitamin B tablets does not protect against insect bites (Chiodini et al, 2007a).

**Chemoprophylaxis (antimalarial tablets)**

It is important that antimalarials are offered. Any recommendations must take into account the type of malaria at the destination, parasite sensitivity to antimalarials and the individual’s medical history. Table 1 summarises current UK antimalarial recommendations.

Travel medicine is rapidly evolving and it is essential that nurses use reliable and up-to-date resources (Chiodini et al, 2007b). The malaria parasite can and does develop resistance to antimalarials and recommendations change in response to this. Nurses should use national non-commercial UK malaria advice, such as the HPA malaria prevention guidelines (Chiodini et al, 2007a), and National Travel Health Network and Centre (NaTHNaC) and TRAVAX resources (Box 1) to help them give accurate advice and prescribe appropriate antimalarials. Country-specific recommendations are based on expert knowledge of the type of parasites present in a malaria risk area and patterns of parasite resistance to antimalarials.

The importance of prescribing the appropriate drug for the destination cannot be overestimated. Travellers visiting areas with different antimalarial recommendations should be protected in all areas of travel.

![Image](https://example.com/image.png)

**FIG 1. MALARIA RISK AREAS**

Source: Field et al (2010)
Table 1. Antimalarial Drugs

<table>
<thead>
<tr>
<th>Chemoprophylaxis/Drug</th>
<th>Presentation</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proguanil</td>
<td>Paludrine tablets</td>
<td>Low cost. Available over the counter. Well tolerated. Suitable for pregnant or breastfeeding women.</td>
<td>Increasing drug resistance: P falciparum to chloroquine. Large number of tablets required if taken in combination.</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Nivaquine syrup; Avlocto tablets</td>
<td>Weekly dose. Effective for most areas of the world. Can be used with caution in pregnancy.</td>
<td>Needs to be started 2-3 weeks before departure. May cause neuropsychiatric adverse events.</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>Lariam tablets</td>
<td>Weekly dose. Effective for most areas of the world. Can be used with caution in pregnancy.</td>
<td>Needs to be started 2-3 weeks before departure. May cause neuropsychiatric adverse events.</td>
</tr>
<tr>
<td>Atovaquone/proguanil</td>
<td>Malarone tablets</td>
<td>Well tolerated. Can be started close to departure date.</td>
<td>Short course.</td>
</tr>
</tbody>
</table>

Source: National Travel Health Network and Centre (2010)

risk, with the highest area of risk always taking precedence (Chiodini et al, 2007a).

Safe and effective malaria prevention requires full knowledge of the traveller’s medical history (Chiodini et al, 2007a). A complete history, including allergies, past and present health conditions, medication and any family history must be taken (Chiodini et al, 2007b). This is to ensure there are no contraindications or drug interactions before antimalarials are prescribed. Nurses must ensure they are familiar with the contraindications and drug interactions associated with different antimalarials (see HPA guidelines in Box 1). It is also useful to ask travellers if they have taken antimalarials in the past, as they may have experienced drug reactions.

Nurses need to carefully assess the malaria risk for each individual traveller. This involves ascertaining:

- What is the most common type of malaria in the region the traveller is visiting?
- Which antimalarials are recommended for this area?
- What activities are they planning?
- Does this increase their risk of getting bitten by mosquitoes?
- How long are they travelling for?
- Are they visiting friends and relatives?
- What sort of accommodation are they staying in? Is it air conditioned?
- Infants and children, including breastfed babies, need their own antimalarials, with the dose adjusted according to body weight. As with all medicines, antimalarials should be kept out of reach of children, as overdoses can be fatal (Field et al, 2010).

Understanding the reason for taking a drug helps patients to complete a course of medication (Winnick et al, 2005). Discussing the importance of antimalarials in preventing life-threatening malaria helps travellers understand why they need to follow recommendations carefully.

- Babies and children should always be carefully supervised when taking antimalarials. Child doses can be crushed and mixed with chocolate spread, honey, jam, formula (on a teaspoon, never in the bottle) or expressed breast milk (if appropriate) to make them easier to take. If tablets need to be split, parents can buy a pill cutter from a chemist to make sure they are divided correctly (Chiodini et al, 2007a).

Diagnosis

Rapid diagnosis and treatment of malaria is essential. Its symptoms should be explained and travellers must be aware that malaria is a medical emergency. People with the condition can become seriously ill very quickly and should be treated in hospital (Field et al, 2010; Laloo et al, 2007). Anyone who has been to a malaria-risk area must understand that if they develop fever or become unwell (seven days or more after being in a malaria-risk area and up to one year after leaving that area), they need prompt medical attention. This includes an immediate blood test for the disease.

Patients with malaria must start treatment straight away. Travellers must be informed that malaria symptoms can be delayed – if they have any symptoms, even up to a year after travel, they still need to see a doctor urgently (Chiodini et al, 2007a).

The British Infection Society has produced an algorithm for health professionals to help the initial assessment and management of patients with suspected malaria (BIS, 2007).

Symptoms of malaria include:
- Fever;
- Headache;
- Sweating;
- Chills;
- Extreme tiredness;
- Aching muscles;
- Diarrhoea;
- Cough.

As well as all of the above, signs of severe malaria in babies and children can include:
- Breathing problems;
- Difficulty sitting or standing;
- Loss of consciousness or seizures (Chiodini et al, 2007a).

Conclusion

Malaria is almost always preventable and failing to take malaria prevention tablets is linked to most cases in the UK. Nurses play a key role in raising awareness of malaria risks and in helping travellers understand the importance of prevention.

Nurses must be given adequate time and support to develop confidence in using the appropriate UK national guidelines, so they advise travellers effectively and prescribe the correct antimalarials.

References

British Infection Society (2007) Malaria – Algorithm for Initial Assessment and Management in Adults. tinyurl.com/BSI-malaria


National Travel Health Network and Centre (2010) Malaria Chemoprophylaxis. tinyurl.com/Nathnac-malaria-chemo
