

By Dr Salim Parker President-elect - SASTM and Lee Baker

Gaitting the Profession Protecting the Public

# TRAVEL MEDICINE

## The deadliest tiny beast in Africa! The malicious malaria carrying mosquito

Anyone who believes in the lesser power of the gentler gender has evidently not come across the female anopheles mosquito. This prowler of exposed human flesh between dusk and dawn not only indulges in a bloody meal when feasting on us, but may also inject into our bloodstream the parasite that causes malaria. The gender issue is further amplified by the fact that pregnant ladies are more at risk of developing severe and even fatal disease once infected.

The good news is that the number of people infected by the malaria protozoa is decreasing, even though the figures for this international public health problem are still startling. With 365 million cases and over 650 000 deaths annually, this decreasing trend is only slightly comforting. Reports vary though, and some estimate that malaria kills close to a million children in Africa annually. Another concern is so that the number of travellers affected by malaria

has been steadily increasing over the last three years. This article will deal mainly with short term travellers; those who travel for a period of less than three weeks. Four species of the Head down, body at an angle, hind legs

Four species of the Plasmodium parasite cause aised-features of the disease in man. Plasmodium anopheles mosquite falciparum, P. vivax, P. ovale, and feeding P. malariae. A fifth, P. knowlesi, initially found in Southeast Asian monkeys, is now also known to cause disease in humans. P. falciparum causes the most serious and fatal forms of the disease, and predominates in Africa. P. vivax was initially considered a 'benign' disease, but the evidence is increasing that it can also cause moderate to severe disease.

When the malaria parasite enters the human bloodstream after a bloody meal by a mosquito, it enters the liver. This phase is asymptomatic. After seven to thirty days the parasite moves out of the liver and infects red blood cells, where it reproduces and leads to

#### Box One: The "ABC" of Malaria prevention

- A: Awareness and assessment of malaria risk
- B: Avoidance of mosquito Bites
- C: Compliance with Chemoprophylaxis, when indicated
- D: Early Detection of malaria E: Effective treatment

the release of more parasites, which in turn continues the cycle of infecting red blood cells. This is the time when symptoms of malaria are experienced. Malaria may mimic a number of diseases and usually presents with non-specific flu-like symptoms. These include fever, chills, muscle pains and aches, headache, cough, diarrhoea, loss of appetite, nausea and fatigue. The disease is often mistaken for influenza and it is thus imperative that doctors enquire about a travel history AND that patients divulge excursions into malaria areas.

Malaria prevention has been very succinctly described in the document prepared the Malaria Advisory Group and which is available at the <u>http://www.doh.gov.za/docs/policy/2011/malaria\_prevention.pdf</u> website. Their 'ABC' of Malaria prevention' is summarised in Box 1.

#### Malaria Risk

Numerous maps that show the malaria transmission areas are

available, and malaria is known to occur in over 100 countries. Consultation with a travel medicine practitioner is advisable as the maps mostly show transmission for countries as a whole, and frequently do not take seasons and regions into account. Other developments, such as recent cases in Greece and in Italy a few years ago, highlight the need for up-to-date information. It has to be borne in mind that the mosquito vector still exists in those two countries. The risk of acquiring malaria whilst visiting one of the large Brazilian coastal cities differs considerable from the risk when entering the Amazon jungle. Similarly maps will show

South Africa as being a country where malaria is endemic and where visitors may be infected. Thanks to a very effective malaria control programme, South Africa is currently in the elimination phase and it is hoped that by 2018, malaria will have been eliminated within South Africa (no more locally acquired infections). Currently, the risk of malaria within the borders of South Africa is very low, with malaria prophylaxis only being recommended in a few areas and during the summer months only: refer to the latest map showing malaria risk.

#### Mosquito bite prevention

The anopheles mosquito bites between dusk and dawn. Anyone who stays in an air-conditioned hotel at night and has short daytime excursions to mosquito infested areas would be at lower risk



than someone who has boardroom daytime meetings but ventures out of the cocooned environment at night. Long sleeved tops and pants, as well as socks and shoes, are recommended to be worn at night in order to reduce the exposed areas when going out. Applying a DEET-containing insect repellent to exposed skin is essential. The mosquito normally feeds low to the ground, and would preferentially bite exposed feet and legs when a person is upright. The manufacturers give clear indications as how often the repellents have to be applied. These agents have to be applied sparingly but properly, as they have defined spatial effects. The concentration should not be less than 20% in anyone including children, and there is no benefit to using concentrations of more than 50%. It should not be used on the face of young ones. Some natural repellents, such as Citronella oil, have to be re-applied every 90 minutes, and become cumbersome to use.

Window and door mosquito screens are frequently available in certain at risk areas; if not doors and windows of rooms should be closed at night. The rooms should be sprayed at dusk and other measures, such as electrically heated mosquito mats or burning mosquito coils, are usefull in high risk areas. Bed nets must be mosquito-proof and the edges tucked in, and one should ensure that there are no holes in them. Protection is increased by periodically treating the nets with an insecticide such as a pyrethroid. Clothing can also be treated with an insecticide. Air conditioned rooms are very effective mosquito deterrents, and ceiling fans are also useful.



Malaria parasites in red blood cells

### TRAVEL MEDICINE

#### Chemoprophylaxis

It is important to bear in mind that most preventative medication does not prevent the parasite from entering the human bloodstream after a mosquito bite and migrating to the liver (at which stage there are no symptoms and no tests can be done to determine whether the person has been infected or not). Except for one which has some activity in the liver itself namely atovaquone–proguanil , they all act in the blood stage of the disease. Hence it is important to note that, except for the above which needs to be used for seven days after the last exposure, the other drugs have to be used for four weeks after departing from the risk area in order to eliminate any protozoa migrating from the liver. Atovaquone–proguanil needs to be started a day or two before entering a risk area, continued daily whilst there as well as seven days after returning. Doxycycline also is a daily medication that is used as above except that it has to be used for four weeks after returning from the malaria area.

Mefloquine is used weekly and is usually commenced two to three weeks prior to entering the malaria area. This is for two reasons; to evaluate for possible neuropsychiatric effects so that Mefloquine can be stopped before departure and an alternative medication can be initiated, and to ensure sustained adequate blood levels of the drug.. There have been many negative reports about mefloquine in the literature, and it certainly is contraindicated in those who suffer from epilepsy and psychiatric conditions. It must be borne in mind that more than thirty million people since 1989 have taken Mefloquine, and 95% completed their courses. It is also the drug of choice in pregnancy, though all pregnant ladies should be advised to avoid travel to malaria areas unless really necessary. All medications have contraindications and potential side-effects, so their use should be discussed with a travel medicine practitioner or doctor.

Only one of the three drugs currently recommended for prophyalxis should be used. There is no scientific evidence to support use of complementary, alternative and homeopathic preparations for the prevention (or treatment) of malaria.

#### Early detection and self treatment

It has to be emphasised that no prophylaxis is 100% effective. Malaria must therefore be suspected in anyone who recently returned from a risk area, and the traveler must inform his doctor about possible exposure. For those who get sick in a malaria area after being there for more than one week, rapid diagnostic test (RDT) kits are available which are reliable if used correctly. The gold standard for diagnosis is still microscopy of a blood smear. Medical advice should be obtained promptly.

Travelers to remote areas sometimes consider taking along emergency standby treatment. This should be done in consultation with a doctor and after a positive RDT result. Treatment usually involves an arthemeter-lumifantrine combination product. Such patients should in any event try to present for medical assessment as soon as possible.

#### The Future

Malaria remains a global threat. Global warming is changing the nature of the mosquito's habitat. Ease of travel, with the mosquitoes hitching a taxi or airplane ride and causing infections in non-endemic areas such as Pretoria (called Oddysean malaria) is another concern. There are numerous strategies presently being pursued to contain the disease, from introducing sterile male mosquitoes to the development of a vaccine. Presently though, good practice revolves around mosquito avoidance, appropriate prophylaxis, and always considering malaria as a possibility when an endemic area has been visited no matter the presentation.

http://www.doh.gov.za/docs/policy/2011/malaria\_prevention.pdf http://upload.wikimedia.org/wikipedia/commons/a/ae/Anopheles\_albimanus\_mosquito.jpg