

## 5. CLINICAL PRESENTATION AND DIAGNOSIS

A high index of suspicion is the most important element in the diagnosis of malaria, in both endemic and non-endemic areas. Malaria areas in South Africa include north-eastern KwaZulu-Natal, and low altitude areas of Mpumalanga and Limpopo (Northern) provinces, particularly those bordering Swaziland, Mozambique and Zimbabwe. Rarely, malaria is contracted in the North-West and Northern Cape provinces adjacent to the Molopo and Orange rivers respectively.

Malaria is endemic in almost all countries in sub-Saharan Africa with the exception of Lesotho. Within each country, geographical distribution of malaria will vary, and year-round transmission with seasonal disease peaks are usual. In southern Africa these peaks are from October to May.<sup>9</sup>

### 5.1 SYMPTOMS AND SIGNS

Symptoms and signs of malaria may present as early as 7 days post-exposure, with an average of 10 - 21 days after being bitten by an infected mosquito. Longer incubation periods may occur in patients who have been on chemoprophylaxis or selected antibiotics eg cotrimoxazole, tetracycline, macrolides, chloramphenicol and quinolones. Incubation periods for *P. falciparum* of 6 - 18 months are unusual but are on record. Malaria due to infections with *P. vivax*, *P. ovale* or *P. malariae* can take up to 12 months to first manifestation.

**Fever** is most common, but may be absent in some cases. "**Flu-like**" symptoms are particularly common presenting symptoms of malaria. Some of the following symptoms may also occur; **rigors, headache, sweating, tiredness, myalgia, abdominal pain, diarrhoea, loss of appetite, nausea and vomiting, and cough.**

In young children malaria may present with **fever, lethargy, poor feeding, vomiting, diarrhoea and cough.**

**Presentation of *P. falciparum* malaria is very variable and may mimic many other diseases** and (vice versa) including influenza, hepatitis, meningitis, septicaemia, typhoid, tick bite fever, gastroenteritis, viral haemorrhagic fever, trypanosomiasis, HIV seroconversion illness, urinary tract infection and relapsing fever.

**Non-immune patients with uncomplicated malaria are at risk for the development of severe *P. falciparum* malaria. Life-threatening complications can develop rapidly in these patients. Malaria should be suspected in any person presenting with any of the above symptoms who has a history of travel to or resides in a malaria transmission area** (Refer to malaria risk map)

In a febrile patient in South Africa where there is no other obvious cause of fever and a recent history of visiting or living in a malaria area is not forthcoming, malaria should still be excluded as infected mosquitoes have been documented to travel long distances in road, rail and air transport.

### 5.2 LABORATORY DIAGNOSIS

Since the clinical presentation is non-specific and may mimic many other diseases, patient blood should be examined immediately to confirm or exclude the diagnosis. A blood test for parasites should be done irrespective of the time of the year or whether the patient has or has not taken chemoprophylaxis.

In the majority of malaria cases, examination of correctly stained blood smears will reveal malaria parasites. However, a negative smear does not exclude the diagnosis; repeat specimens should be examined regularly and urgently until the diagnosis is confirmed, the

patient has recovered or another definitive diagnosis is made. Examination of the peripheral blood smear will give an indication of the species of parasite as well as the level of parasitaemia. High levels of parasitaemia ( $\geq$  to 5% or  $\geq 3+$ )\* are generally predictive of severe malaria in non-immune patients. Importantly, the converse may not be true, with severe disease also occurring with low parasitaemias in the peripheral blood. The interpretation of a low parasite count must always be considered in conjunction with the patient's clinical picture and other laboratory results (See also 7.1).

A number of commercial kits are available for rapid diagnosis.<sup>10</sup> Most of these kits detect parasite antigen namely histidine-rich protein 2. The majority of the tests are only suitable for *P. falciparum* diagnosis, while a few will detect the other malaria species. The rapid tests for *P. falciparum* are highly sensitive. Performance is, however, dependent on the correct usage and interpretation of results and the quality of the particular test used. These tests should be used only for diagnosis of acute malaria infections, and not for follow-up, as the test may remain positive for several weeks even after successful treatment. The test may be negative early in diagnosis, and false positives may be encountered rarely, for example in collagen vascular disease.

\* The parasite count refers to the parasite load in the peripheral blood expressed semi quantitatively (1- 5+) or as a percentage of infected red blood cells. Quantification is often inaccurate and does not necessarily reflect the total parasite load in the patient.

If the diagnosis of malaria cannot be confirmed (unavailability of laboratory tests, or negative tests), the decision to commence malaria therapy should be made on clinical grounds; presence of appropriate clinical features, possible exposure to malaria parasites and the severity of the clinical picture. In cases of severe malaria a blood smear or rapid malaria test is likely to be positive. However, some patients with severe malaria may have a negative smear due to sequestration of parasitized red blood cells. In patients who are treated empirically for malaria, it is imperative to also look for alternative diagnoses and to follow up patients very carefully.

Thrombocytopenia is a common finding in patients with malaria. A slide should be checked for malaria parasites whenever this laboratory finding is made unexpectedly.