rapid diagnosis of falciparum malaria by using the Parasight F test in travellers returning to the United Kingdom: prospective study

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A simple diagnostic strip test for *Plasmodium falciparum* malaria (Parasight F test, Becton Dickinson Advanced Diagnostics) detects a water soluble antigen, histidine rich protein 2, which is produced by blood stages of *P falciparum*. High sensitivity and specificity have been reported for the test in areas where malaria is endemic and in studies of travellers returning from such areas. We compared the test with standard blood film microscopy in febrile travellers returning to the United Kingdom from such areas.

**Subjects, methods, and results**

We studied 160 consecutive patients aged 9–77 years presenting between April 1994 and June 1996 to our unit with a history of fever and travel in the previous year to an area where malaria is endemic. Thin films were stained with Giemsa and read by an experienced microscopist. The Parasight F test was performed in accordance with the manufacturer’s instructions; a pink band indicates a positive result. Each test took less than 10 minutes to perform. Thin films and test strips were read blind to each other.

In 45 patients falciparum malaria was the final diagnosis (table). At presentation 42 cases were detected by microscopy and 42 by the Parasight F test. Parasitaemias ranged from <0.01% to 15% of erythrocytes parasitised. In one patient, the test was positive at presentation, and scanty (<0.001%) *P falciparum* trophozoites were detected on blood film only on day 2. In two other patients both the blood film and the test gave negative results at presentation but positive results on subsequent days. One patient had a positive test with a negative blood film; three days previously he had had halofantrine treatment for presumed malaria. One patient with pneumococcal meningitis had positive tests over three days with negative daily blood films. The test was negative in one patient with a *P falciparum* parasitaemia of <0.01%.

Test results were negative in all 113 other patients who did not have *P falciparum* infection, including 27 infected with other malarial species (23 with *P vivax*, 3 with *P ovale*, 1 with *P malariae*). Other diagnoses included diarrhoeal disease, dengue fever, typhoid, pneumonia, urinary tract infection, brucellosis, acute myeloid leukaemia, and infectious mononucleosis.

Compared with the final diagnosis, the Parasight F test used at first presentation had a sensitivity of 93.3%, a specificity of 98.3%, a positive predictive value of 95.6%, and a negative predictive value of 97.4%.
Comment

The ParaSight F test is simple, rapid, and has adequate sensitivity and specificity for initial assessment of \( P \) falciparum infection in returning travellers. It identified all patients with \( P \) falciparum apart from one patient with a low parasitaemia of <0.01% and two patients with parasites not detected on initial microscopy. Positive test results in the patient treated with halofantrine are explained by the established persistence of histidine rich protein 2 in the blood for up to 10 days. Positive results of the patient with pneumococcal meningitis were taken to be a genuine false positives.

The test does not remove the need for blood film examination as it is not 100% sensitive at low parasitaemias, and repeated daily testing may be necessary to establish the diagnosis. Nor does the test give any indication of density of parasites, essential in planning management.

The ParaSight F test has a useful role in the initial screening of febrile returning travellers with suspected falciparum malaria, particularly where laboratory staff are not experienced in diagnosing malaria. The test can be considered a “side room” investigation, as it requires no special training. It may also be used to distinguish between the benign malarias and the potentially lethal falciparum malaria.

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