Proposed guidelines for malaria antigen testing

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To the Editor: The use of rapid immunochromatographic antigen detection tests (RDTs) to diagnose malaria infection in South African pathology laboratories has been both a blessing and a confounder over the years. RDTs are sensitive and have probably saved many lives. On the other hand laboratory personnel tend to become overly reliant on antigen tests instead of using them in conjunction with microscopy, and pan-malarial antigen tests have sometimes led to confusion and misdiagnosis. We propose the following guidelines for malaria antigen testing in the hope of improving the use of malaria antigen tests in South Africa.

Many rapid malaria antigen tests use immunochromatographic technology. Rapid antigen testing provides a simple, quick, sensitive method for determining the presence of malaria parasites. Their sensitivity for detecting Plasmodium falciparum infections is usually high (> 90%) compared with light microscopy in a routine laboratory setting. However, any malaria antigen test should first be validated for the setting in which it will be performed, then regularly quality-assured thereafter. In addition, these tests should not be considered a complete substitute for direct microscopic examination of thick and thin Giemsa-stained blood smears, which remains the international gold standard for the detection and identification of malaria parasites.

Circumstances under which malaria antigen testing should be performed

- Antigen testing should be performed only by suitably trained staff.
- Storage conditions, expiry dates and methods should be strictly adhered to.
- Antigen testing is useful to obtain a quick preliminary result, and the laboratory report should reflect that a limited test was performed.
- Antigen test results should be analysed in conjunction with thick and thin Giemsa-stained blood smears where possible.
- Antigen testing is useful to confirm the presence of P. falciparum in a mixed infection with another malaria species.
- Antigen testing is useful in situations where there is no experienced, competent microscopist or equipment available to perform blood smears.

Limitations and misconceptions about malaria antigen tests

- Persistence of antigenaemia despite parasite clearance following treatment has been observed with the histidine-rich protein 2 (HRP II) antigen tests. This limits their use in terms of monitoring response to treatment and may cause confusion in the evaluation of treated patients.
- RDTs that detect both P. falciparum and non-falciparum species cannot distinguish pure P. falciparum infections from co-infections with P. falciparum and the other malaria species, as the test line configurations are limited.
- RDTs that detect both P. falciparum and non-falciparum species cannot differentiate between P. vivax, P. ovale and P. malariae.
- False-negative results, even in the face of high parasitaemias, have been described.
- False-positive results, especially in patients who are rheumatoid factor-positive, are possible.
- Many antigen tests that claim to detect P. falciparum and P. vivax in fact do not specifically detect P. vivax, but rather a pan-malarial antigen common to all four human malaria species. This can lead to confusion in the laboratory. However, the sensitivity of pan-malarial antigens for P. ovale and P. malariae infections has been reported to be low.
- P. falciparum accounts for more than 95% of the malaria cases in southern Africa, so an antigen test detecting only this species is the most cost-effective solution. P. vivax is the least common of the four human malaria species occurring in southern Africa, making antigen testing for this species scientifically questionable.
- The sensitivity of antigen tests decreases at low parasitaemias and may only be 50 - 70% compared with microscopy at parasite loads less than 100/µl.
- A practical limitation is lack of parasite load quantitation, which is regarded as integral to laboratory diagnosis of malaria.
- Batch quality variability of RDTs has been reported.

Malaria antigen tests are a valuable additional tool when used under the correct circumstances and in conjunction with smear microscopy. It is important that the abovementioned limitations of RDTs are well understood to allow the correct interpretation and use of these tests. In laboratories with inexperienced malaria microbiologists and where reliable microscopy may not be available, it would be in the patient’s best interests to perform both malaria antigen testing and blood smear examination.
Playstation thumb – a new epidemic in children

Safura Abdool Karim

To the Editor: Repetitive strain injury (RSI) is a painful condition, which can sometimes be serious, affecting the arms and hands. It results from repeated movements that damage tendons, nerves, muscles, and other soft-body tissues. Jobs ranging from meat packing to the playing of a musical instrument1 can lead to this kind of injury as a result of the tasks performed. In extreme cases RSI can cause a person to become wheelchair bound.

With increasing use of computers at work, home, and school, injuries of the hands, arms, and shoulders are becoming common. Playstation thumb is a RSI resulting from continuous playing of playstation games for many hours and can manifest as pain in the thumbs and blisters on the tips of the thumbs. Other associated symptoms include pain, stiffness, swelling, numbness and tingling of the hands, wrists, elbows, shoulders, back or neck.

After reading a letter to the Editor in the Lancet2 about a case of playstation thumb in a young girl in England, I did a survey of the extent of this problem at my school. The survey was done at the Crawford Preparatory School in Durban among 120 Grade 4 - 7 learners. Their ages ranged from 9 to 13 years. Thirty learners from each grade, an equal number of boys and girls, were interviewed using a list of 7 questions. Each participant was asked if s/he played playstation games and, if so, how often and for how long, on average. I also asked everyone if they experienced any playstation symptoms including pain in the thumb or wrist and the presence of blisters.

My results show that more boys played playstation games regularly. Twenty-eight of the 60 boys and 17 of the 60 girls played regularly. However the boys had fewer symptoms of playstation thumb. Eight of the 28 boys and 7 of the 17 girls who played regularly had symptoms of playstation thumb. No one had serious problems or symptoms. Those who played more playstation had more symptoms, especially if they played for more than 3 hours per day.

Playstation thumb was common in this survey. Although RSI is not new, in the past it occurred mainly among adults. Today computers and computer games are creating new medical problems, such as playstation thumb, which are becoming common in children.

Acknowledgement. Thanks to my mother for showing me the letter in the Lancet and to Cheryl Baxter for advice on how to write this letter and for help with the musician reference. I did this survey as a science project for my school’s Science Day.


Table I. Number of learners who had symptoms of playstation thumb

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<th>Girls Have symptoms of playstation thumb</th>
<th>Boys Play playstation regularly</th>
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