

MALARIA SCREENING AND SURVEILLANCE IN THE NORTHERN TERRITORY - PROTOCOLS FOR ACTIVE SCREENING OF STUDENTS FROM HIGH RISK AREAS

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In the past malaria was endemic in the Northern Territory (NT), resulting in numerous deaths in the Aboriginal and mining communities. Extensive programs to eradicate malaria included active case surveillance, mass drug therapy and vector control. The last endemic case was reported in 1962 and the World Health Organization declared Australia malaria free in 1981. However, the Top End of the Northern Territory is still receptive to re-establishment of indigenous malaria. In addition to increasing numbers of imported malaria cases, introduced malaria (brief local transmission) occasionally occurs in tropical Australia^{1,2}, justifying concerns about indigenous malaria. To help decrease this risk in the NT and to decrease the morbidity from malaria, a passive surveillance program has been complemented with an active screening and surveillance program for students arriving from countries with endemic malaria.

Passive surveillance

A protocol with aggressive anti-malaria measures has been in place for a number of years for notified cases. The measures include:

- all laboratories immediately notifying cases to the NT Disease Control Centre (DCC),
- initial admission to hospital of all malaria cases to minimise parasite-mosquito contract and to supervise drug therapy,
- staff from DCC interviewing the patient for a detailed travel history before and after arrival in Australia,
- notifying the Medical Entomology Branch for assessment of the need for initiating vector investigation and control measures,
- contacting co-travellers and offering a blood test for malaria,
- home follow-up by Community Health staff to ensure compliance with primaquine eradication therapy.

Active screening and surveillance

In 1991, when five cases of malaria were diagnosed in 17 students from Papua New Guinea (PNG)³, it became apparent that there was a need to monitor persons from high risk malarious areas who will spend prolonged

periods of time in the Top End. (High risk areas are defined as PNG, Solomon Islands, Vanuatu, Myanmar, Laos, Cambodia, Vietnam and parts of Thailand, Malaysia and Indonesia¹.) These persons are more likely to have partial immunity to malaria with asymptomatic parasitaemia, but some will also develop severe clinical malaria while in Australia. Since secondary school students from high risk areas are readily identifiable when compared with other migrants, an active malaria screening and surveillance program was introduced.

Initially, screening was introduced into the secondary school system with the Department of Education. Students from high risk malarious areas were targeted with the following measures:

- a blood test to screen for malaria in initial entry into Australia. This measure was modified early in 1993 to include screening on every entry into Australia,
- recommending malaria prophylaxis during holidays at home, noting the loss of partial immunity when the students are out of a malarious area for prolonged periods, and
- a letter to students and their 'foster' parents alerting them to think of malaria and to seek medical advice for any illness.

Data were collected over the last three years from secondary school students in Darwin (Table 1). Of the 17 cases of malaria in secondary school students, asymptomatic infection was detected in five on screening. Eight developed clinical malaria soon after arrival in Australia before screening took place. Three students treated for clinical malaria subsequently relapsed with *Plasmodium vivax* malaria despite 14 days of 22.5mg daily primaquine. One student with asymptomatic *P. vivax* malaria on screening subsequently developed clinical *P. falciparum* malaria. One student with clinical *P. malariae* malaria in 1991 was reinfected during holidays in PNG and presented with clinical *P. falciparum* malaria soon after return to Darwin in 1993. It seems likely that in the NT we can expect malaria to be detected each year in at least one in 10 secondary students from high risk malarious areas such as PNG and the Solomon Islands.

Two problems have been identified since the introduction of this policy. Self-medication prior to arrival in Australia is common and compliance with malaria prophylaxis is poor in the holidays. Both problems are

1. Northern Territory Department of Health and Community Services, Darwin.
2. National Centre for Epidemiology and Population Health, Canberra.

Table 1. Overseas students from high risk malarious areas attending secondary schools in Darwin, and cases with malaria, by year

	1991	1992	1993
Students from high risk areas	17	34	54
Students treated for clinical malaria ¹	4	4	4
Students treated for asymptomatic malaria ¹	1	1	3
NT total malaria cases	45	30	34

1. 17 total cases in 12 students.

Table 2. Overseas students from malarious countries¹ attending university in Darwin, and cases with malaria, by year

	1991	1992	1993
Student numbers	78	81	90
Reported cases of malaria	0	0	2 ²

1. Low and high risk malarious countries combined.

2. One official notification and one self-medication admitted to the student health service doctor.

being addressed with educational efforts. However, with the new prophylactic guidelines recommended by the National Health and Medical Research Council⁴, compliance in the future may be even more problematic since doxycycline requires daily administration and mefloquine costs around \$8 for each weekly tablet. These concerns led to the recent change of our screening policy from initial entry only to screening on every entry into Australia.

The active screening program was extended in 1993 to include students at the NT University from malarious countries (Table 2). However, problems are anticipated in this setting also. These students are adults and possibly more likely to refuse screening. They are also accustomed to self-medicating at home when clinical malaria occurs and therefore may be more reluctant to seek medical advice or treatment. In contrast, the 'foster' parents of secondary school students usually

actively seek help. Some adults students are accompanied by a spouse and children. Arrangements have been made for the students' family members to be tested free of charge at Community Health Clinics. The uptake and acceptance of these measures remain to be seen. Education is again necessary to obtain the voluntary co-operation of both students and their families. It will take several years to raise awareness among overseas students, local education staff and fellow students to a level where screening will be generally acceptable and self treatment uncommon.

Of note is that few cases of malaria have to date been notified from NT University students (Table 2). This may in part reflect self-medication. However, many of these students are from areas of substantially lower malaria risk when compared with the majority of the secondary students who come from PNG and the Solomon Islands¹. It is anticipated that overseas student numbers in the NT will continue to increase, including more university students from high risk malarious areas.

In summary, we have delineated the NT malaria screening and surveillance system. The passive surveillance with its attendant protocol is now routine and well accepted. We are still in the process of initiating active screening and surveillance into the educational system. The initial measures appear to be tolerated by secondary students and to be acceptable to the school nurses and local student liaison officers who are vital to the program.

References

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