

Malaria acquired in the Torres Strait

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Abstract

Two cases of *Plasmodium vivax* malaria acquired in the Torres Strait during 1997 are reported. The source of infection could not be firmly established but two possibilities are discussed. Anopheline mosquitoes are present in the Torres Strait, and malaria is frequently imported from Papua New Guinea (PNG), thus transmission by local mosquitoes poses an ongoing threat. However, in this particular location, Badu Island, no recent importation of malaria was identified and mosquito surveillance demonstrated low numbers of anopheline species at the time and for the preceding two years. These cases could also feasibly be explained by a variant of 'baggage malaria' in which mosquitoes already infected with the malaria parasite were imported from PNG in one of the small boats that regularly make this journey. These cases serve as a reminder to health care providers in northern Australia to consider the diagnosis of malaria in patients presenting with a febrile illness.

Introduction

Malaria is commonly diagnosed in the Torres Strait with virtually all cases being imported from Papua New Guinea (PNG). During 1996, for example, a total of 67 cases were notified; 50 of these were visitors from PNG and the remainder were local residents with a history of travel to PNG. Despite the presence of anopheline mosquitoes in the Torres Strait, in particular *Anopheles farauti sensu lato* (*An. farauti s.l.*),¹ locally acquired cases of malaria are uncommon. The last known cases were acquired on the island of Saibai in 1991

(unpublished data, Tropical Public Health Unit).

Two cases of *Plasmodium vivax* (*P. vivax*) malaria that were acquired in the Torres Strait in 1997 are presented in this report.

Methods and Results

Malaria was confirmed in two residents of Badu Island in the Torres Strait in mid-June 1997. Both had *P. vivax* detected in blood films at the Thursday Island Hospital and subsequently confirmed by the Malaria Reference Laboratory, Centre for Public Health Sciences, Brisbane. The two cases were unrelated and lived

in homes separated by a distance of at least 500 metres in a community of over 600 people. Neither case had ever travelled to PNG, nor had they recently travelled elsewhere in the Torres Strait.

The first case was a 17 year old male who initially presented with fever and headache on 5 June 1997. He commenced oral amoxicillin therapy on 9 June for bilateral otitis media and cough, but his fever persisted and blood films confirmed malaria on 11 June. He responded rapidly to oral quinine (600mg x3 daily for 3 days) and Fansidar (3 tabs on day 3).² He underwent

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primaquine therapy (7.5mg x3 daily for 14 days)³ following a normal glucose-6-phosphate dehydrogenase (G6PD) assay, and has remained well.

The second case was a 54 year old male who presented on 9 June with bilateral otitis media. He commenced oral amoxicillin therapy and re-presented the following day with fever and confusion. He was evacuated to the Thursday Island Hospital and treated with intravenous ceftriaxone and penicillin for presumed septicaemia. Blood films confirmed malaria later that day and he responded rapidly to oral quinine (600mg x3 daily for 3 days). His G6PD levels were low and he was not treated with primaquine.

Further cases of malaria were actively sought by clinic staff. Blood films were taken from the household contacts and immediate neighbours of both cases and from other patients who subsequently presented to the Badu Health Centre with a febrile illness. A total of 17 additional films were collected and examined at the Thursday Island Hospital. Staff at each of the other clinics throughout the Torres Strait were informed of the situation and requested to arrange blood films for all febrile patients. No further cases of malaria were detected.

Discussion

The specific mechanism of transmission is unclear in these cases. Transmission by local mosquitoes would require: a source of infection (such as, a visitor from PNG with gametocytes present in peripheral blood), the presence of adequate numbers of the mosquito vector, and climatic conditions that allowed the completion of extrinsic incubation of the parasite within the mosquito.⁴

The source of infection could not be identified. The last recognised case of imported malaria on Badu Island was on 22 February 1997, when *P. vivax* (with gametocytes) was detected. The time taken for extrinsic incubation in the mosquito is 8-16 days and the incubation period in humans is usually 12-17 days.⁴ Although prolonged incubation up to 9 months or more has occurred in more temperate areas, in tropical regions such as the Torres Strait, incubation periods for *P. vivax* are typically short.⁵ Therefore, it is most unlikely that the two

locally-acquired cases in June were linked to the February importation.

Unrecognised importation could have occurred at a later date as people frequently travel to and from PNG. Visitors from PNG slept in the house of the first case in late March, and frequently stayed with neighbours of the second case. Several factors contribute to the possibility of unrecognised importation; visits to the island are often brief, PNG residents with a history of recurrent malaria may have asymptomatic parasitaemia, and the gametocytes of *P. vivax* appear early in the infection, possibly before a diagnosis is made.

Mosquito surveillance has been actively maintained in the Torres Strait following several cases of Japanese encephalitis in 1995.⁶ This surveillance has shown that the numbers of *An. farauti s.l.* have consistently been low on Badu Island for the last two years. Light traps baited with dry ice were set in late March 1997 and yielded an average count of three *An. farauti s.l.* per trap, with 25 captured in a trap set about one kilometre from the community (unpublished data, van den Hurk, Tropical Public Health Unit). Further light trapping and a larval survey on Badu Island on 17 June 1997 detected low total mosquito numbers and no anopheline species. Such low levels are considered to indicate a negligible risk of local malaria transmission.⁷

Climatic conditions during this period were probably adequate for completion of parasite development in the mosquito, as nearby Horn Island recorded a minimum temperature of 19°C and minimum relative humidity of 58% for the months of April and May 1997 (personal communication, Bureau of Meteorology, Brisbane).

The absence of an identified recent imported case, and the capture of such low numbers of *An. farauti s.l.* make it difficult to readily accept that local transmission occurred in this manner, although it cannot be completely ruled out.

Local transmission could also feasibly occur if mosquitoes already carrying the parasite were themselves imported from a malarious area. This phenomenon, although rare, is well recognised elsewhere with titles such as 'airport', 'harbour' and 'baggage' malaria, in recognition of infected mosquitoes purportedly travelling to

non-endemic regions in planes, boats and personal baggage.^{8,9,10,11} There are no direct flights from PNG to Badu Island, but considerable numbers of visitors from PNG regularly travel to the island in small open boats; a journey of about four hours duration. It is plausible that infected mosquitoes could be imported in 'baggage' carried on such trips.

These cases serve as reminder that, while the risk of serious outbreaks of malaria in northern Australia is increasingly recognised as low,¹² health care providers in northern Australia may occasionally encounter an unusual case of malaria. The diagnosis should be considered in patients presenting with a febrile illness so that prompt treatment can be given.

References

1. Foley DH, Bryan JH, Booth D and Freebairn CG. *Anopheles farauti*, *Laveran sensu lato* and *An. hilli* in Torres Strait, Australia. *J Aust Ent Soc* 1991;30:307-312.
2. Tropical Public Health Unit. Malaria in the Torres Strait: Guidelines on diagnosis, treatment and control for health care staff. 2nd ed. Cairns: Tropical Public Health Unit, 1997.
3. Antibiotic Guidelines subcommittee, Victorian Drug Usage Advisory Committee. Antibiotic Guidelines. 9th ed. Melbourne: Victorian Medical Postgraduate Foundation, 1996.
4. Gillies HM, Warrell DA. Bruce-Chwatt's essential malariaology. 3rd ed. London: Edward Arnold, 1993.
5. Brooks DL, Ritchie SA, van den Hurk AF et al. *Plasmodium vivax* malaria acquired in far north Queensland. *Med J Aust* 1997;166:82-83.
6. Hanna JN, Ritchie SA, Phillips DA, Shield J, Bailey MC, Mackenzie JS et al. An outbreak of Japanese encephalitis in the Torres Strait, Australia, 1995. *Med J Aust* 1996; 165:256-260.
7. Hanna JN, Brookes DL, Ritchie SA, van den Hurk AF, Lowenthal MR. Malaria and its implications for public health in far north Queensland: a prospective study. *Aust NZ J Public Health*. In press.
8. Isaacson M. Airport Malaria: a review. *Bull World Health Org* 1989; 67:737-743.
9. Jenkin AJ, Ritchie SA, Hanna JN, Brown GV. Airport Malaria in Cairns. *Med J Aust* 1996; 166:307-308.
10. Delmont J, Brouqui P, Poullin P, Bourgeade A. Harbour acquired *Plasmodium falciparum* malaria. *Lancet* 1994; 344:330-331.
11. Castelli F, Caligaris S, Matteelli A, Chiodera A, Carosi G, Fausti G. 'Baggage malaria' in Italy: cryptic malaria explained? *Trans R Soc Trop Med Hyg* 1993; 87:394.
12. Hanna JN, Ritchie SA et al. Malaria and its implications for public health in far north Queensland: a prospective view. *Aust NZ J Public Health*. In press:1998