VACCINATION AGAINST JAPANESE ENCEPHALITIS IN THE TORRES STRAIT

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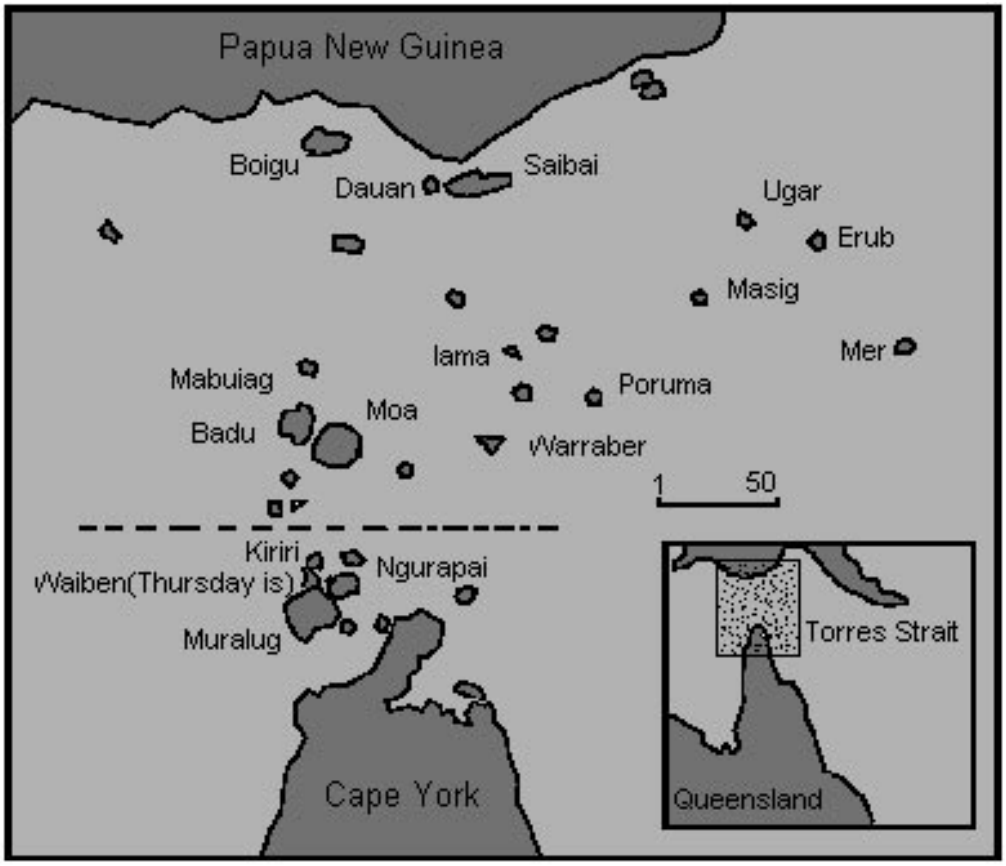
Abstract

Three cases of Japanese encephalitis (JE) occurred among residents of Badu Island in the Torres Strait in early 1995. Although this was the first recognised outbreak of locally acquired JE in Australia, there were subsequent indications that JE was widespread at that time throughout the outer Torres Strait islands. Strategies to minimise the risk of future cases of JE in the Torres Strait were implemented. As a munber of these strategies would take time to implement, vaccination of the population of the outer islands of the Torres Strait before the 1996 wet season was recommended. Vaccine was ordered, and mobile teams, each vaccinating seven communities in the area, administered the vaccine. Several clinics were established to vaccinate people who had temporarily moved away and those moving to the outer islands. JE vaccine was administered to 3,440 people. The vaccination achieved high levels of uptake, with 93% of those who commenced the series receiving two or three doses. Ongoing surveillance using sentinel pigs on the islands is in place to detect further incursions of the JE virus into the Torres Strait.

Background

Three cases of Japanese encephalitis (JE) occurred among residents of Badu Island in the Torres Strait in March-April 1995[1]. Subsequent serological surveys indicated that JE virus activity was widespread throughout the outer Torres Strait Islands at, or about, that time (unpublished data).

Figure. The Torres Strait. The outer islands are north of the arbitrary dotted line



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Although JE is widespread in Asia, the Torres Strait outbreak was the first recognised occasion of locally acquired JE in Australia. In response, a workshop was convened in mid-July 1995 to develop strategies to minimise the risk of future cases of JE in the Torres Strait. Among the short-term (relevant to the 1995-96 wet season) strategies that were considered were the vaccination of people and vaccination of pigs.

At the time, it was considered that concerns about the delayed moderately severe hypersensitivity reactions reported following the administration of the human vaccine[2], and the lack of any information concerning the risk of future outbreaks, did not justify the widespread use of the vaccine. It was proposed instead that pigs be vaccinated, thereby eliminating amplifying hosts from the community environments. Vaccinating pigs would render them unsuitable for surveillance. The Torres Health Council approved the testing of unused human sera, from blood specimens sent for routine laboratory studies, for opportunistic surveillance for JE.

By mid-October it was clear that the animal vaccine would not be available before the 1995-96 wet season and that the proposed risk-assessment studies to determine the likelihood of further incursions of the JE virus into the Torres Strait would take considerably longer than anticipated. An urgent recommendation for a mass vaccination program to cover the population of the outer islands of the Torres Strait before the wet season was forwarded to the then Commonwealth Department of Human Services and Health. On 1 November 1995, it was announced that the Federal Government would fund the purchase of JE vaccine for the people of the outer Torres Strait islands, and Queensland Health would cover the administration costs.

Implementation of the vaccination program

There are 14 communities on 13 outer Torres Strait islands (Figure).

Although there are no reliable census data for the Torres Strait, it was estimated that the population of the outer islands was about 3,000. Local sources suggested that the vaccine uptake would be poor beyond Badu Island, and therefore vaccine was ordered from the vaccine distributor for 2,000 adults and 400 children (one to three years of age).

During November a considerable effort was made to inform the residents of the outer islands on how to minimise the risk of acquiring JE through personal protection measures (repellents, mosquito coils, bed nets etc.) and about the vaccination program. Public Health staff visited each outer island community to brief councils and address community meetings to pass on the information. Two posters were developed and displayed throughout the communities.

Information pamphlets about JE and vaccination consent forms were prepared in English and in the local vernacular. Both specifically mentioned that people who have significant allergies to bee stings, foods and medicines may be more susceptible to allergic reactions to the JE vaccine, and that those who receive the JE vaccine should:

(i) not leave the clinic for 30 minutes after receiving the vaccine,

(ii) not drink alcohol for two days after administration of the vaccine, and

(iii) remain within ready access to medical care for ten days following vaccination.

The advice concerning alcohol was based on tentative findings that suggest that a greater than usual intake of alcohol after vaccination may be associated with adverse reactions (R Kass, personal communication). Community Health staff circulated these sheets in advance of the vaccination teams to obtain consent. The local media - radio and newspaper - also ran stories on the prevention of JE and on the vaccination program.

Every outer island community has a health centre staffed by local health workers; five of the communities have resident registered nurses. Medical services are provided by medical practitioners from Thursday Island visiting on a two- to four-weekly basis. Two mobile teams, each vaccinating seven communities, administered the JE vaccine. Each team consisted of a medical practitioner, at least two registered nurses and the local health workers. Extra nursing staff from outside the Torres Strait had to be assigned to the program to ensure that there were adequate staff not only to constitute the teams but also to maintain routine services. A registered nurse remained behind on each community for three days after vaccination to monitor for adverse reactions.

Prior to the start of the vaccination program, all nursing staff and senior health workers involved in the program participated in a workshop. Details of the JE vaccine, the reported adverse reactions and their management, and details of the program, including itinerary and staff movements, were discussed. Three workshops were convened, two in the Torres Strait and one in Cairns. All attendees were given protocols on JE vaccination and the management of adverse reactions. To cater for Torres Strait residents temporarily away and people moving to the outer islands (for example to commence employment), three JE vaccination clinics were established off the outer islands: in a travel medicine clinic in Brisbane, in a general practice in Cairns and in the Outpatients Department of Thursday Island Hospital.

Vaccine was recommended for all residents over one year of age of the outer Torres Strait Islands unless they had proven immunity by testing positive for JE during the serological survey, and all non-residents who would be living or working on the outer Torres Strait islands in the 1995-96 wet season for the equivalent of 30 days or more[2]. People who had past history of an allergic reaction that required systemic therapy were advised not to have the vaccine.

The vaccine schedule (three doses given on days 0, 7 and 28) required each team to vaccinate one community every day for a week, and then, without any delay, return to the first community to start the second round. The vaccine arrived in time to commence the program as planned on Sunday, 3 December. Additional refrigerator space had to be found on Thursday Island as the volume of vaccine was too great for the hospital's pharmacy. The third round commenced on 8 January (day 35) to allow communities to celebrate New Year (day 28) without undue interference.

Each vaccination clinic required at least two vaccinators working out of separate examination rooms; details of each vaccination were usually recorded by a local health worker or community member. Self-inking stamps were used to record the vaccine batch and date of administration in each client's clinic record. The client's name, sex, date of birth, community of residence, date of vaccination and vaccine batch were recorded and faxed to the Tropical Public Health Unit in Cairns. An administrative officer dedicated to the task entered the information on to an Epi Info database. Printouts for each community were faxed back for correction and used for entering information about subsequent doses in due course.

The logistics of transport (fixed-wing aircraft and occasionally helicopter) between islands, staff movements, accommodation, cold chain requirements and vaccine supply from Thursday Island to, and between, the outer islands was coordinated by a senior registered nurse dedicated to the task.

Several circumstances threatened the program:

(i) One of the chartered aircraft became inoperable without any warning during the first (sequential) two rounds. This required urgent rescheduling of flights and staff movements.

(ii) A shipment of JE vaccine was rejected soon after arrival in Australia, which could have resulted in insufficient vaccine to compete the second round. However the Australian distributor was able to obtain an urgent replacement shipment, employ staff to work overnight to relabel the vaccine to meet Australian requirements, and to courier the shipment to the Torres Strait before existing stocks were exhausted.

(iii) There was an unexpected demand for vaccine by the local residents, far exceeding predictions. The outcome was that Federally funded vaccine was virtually exhausted after the second round, leaving no vaccine to begin the third round. This shortfall was predicted soon after the end of the first round and on 12 December a request was made to the Federal Government for further funding to enable an urgent order to be placed for an additional 2,000 doses of vaccine. The funding was approved and the extra vaccine was obtained in time to commence the third round.

By 19 January, 9,046 doses of JE vaccine had been administered to 3,440 people. Remaining stock was used opportunistically during routine medical clinics, particularly to catch up on second and third doses in those who had commenced but not completed the vaccination regimen. By the end of March 1996, 2,529 people (2,455 from the outer islands) had received three doses, 732 (687 from the outer islands) had received two doses and 250 (222 from the outer islands) had received only one dose. A total of 9,301 doses of vaccine had been administered, with 8,961 being given to residents of the outer islands.

There were ten reports of mild allergic (urticarial) reactions in the 48 hours following receipt of the vaccine; these individuals were advised not to have further doses of the vaccine. There were *no* episodes of acute or delayed moderate or severe reactions of any sort; in particular there were no episodes of delayed moderately severe hypersensitivity reactions.

Summary

Regardless of the formidable logistics, and the local predictions of poor compliance, the vaccination program achieved very high levels of vaccine uptake, with 93% of those who commenced the series receiving two or three doses. No severe adverse reactions occurred. Ongoing surveillance using sentinel pigs is in place to detect any further incursions of the JE virus into the Torres Strait, and may help to determine the need for future vaccinations (for example in young children) and booster doses[3].

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