REAPPEARANCE OF THE JAPANESE ENCEPHALITIS VIRUS IN THE TORRES STRAIT, 1996

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Following an outbreak of Japanese encephalitis (JE) in the Torres Strait in March - April 1995[1], the inactivated JE vaccine was offered to all residents of the outer islands of the Torres Strait in December 1995 - January 1996. Nearly 9,000 doses of vaccine were administered; 88% of the residents who commenced the vaccination regimen received at least two doses. The high uptake of the vaccine precluded the use of residual sera (from samples forwarded to the Thursday Island Hospital laboratory for clinical purposes) for surveillance to detect further incursions of the JE virus into the Torres Strait.

Queensland Department of Primary Industries (QDPI) and Queensland Health jointly established a system using pigs on three outer islands (Badu, Saibai and Erub), on one inner island (Kiriri) and on the North Peninsula Area (NPA) at the tip of Cape York, as sentinel animals for surveillance. Young pigs (those born after the 1995 outbreak) were chosen assuming them to be susceptible at the onset of the 1995-96 wet season. The three outer islands were chosen because all three have substantial numbers of domestic pigs, have local Australian Quarantine Inspection Service staff to assist with the collection of blood samples from the pigs, and they represent north-south and east-west axes across the outer Torres Strait. Further, Badu was the focus of the 1995 outbreak, and Saibai is within a few kilometers of the Papua New Guinea (PNG) coastline.

The outer island pigs were first bled in late January and early February 1996. A total of 78 pigs were sampled, 40 from Badu, 20 from Saibai and 18 from Erub. As they were sampled they were tagged with a numbered ear tag to allow identification during future samplings. The samples were initially tested by haemagglutination inhibition (HAI) assay, and then plaque reduction neutralisation assay (PRNA) was performed upon any sera with elevated HAI titres. Seven of the pigs, four from one island and three from another, tested positive for JE. The three pigs that tested positive on one island were young (about two months) and belonged to the same litter. All other pigs from the island that were tested were negative. This suggests the pigs that tested positive had maternally acquired antibodies; the mother of the litter was subsequently found to have a very high JE antibody titre, supporting the hypothesis. All four pigs on the other island were subsequently recognised as being older than originally thought and they were alive during the 1995 outbreak.

The first sampling at the end of January-early February provided no firm evidence of JE virus transmission since the 1995 outbreak. Importantly, it identified 71 pigs as being susceptible in early 1996; these pigs became the focus for further surveillance.

The second sampling took place in mid-March, and 66 pigs from the three outer islands were bled. On 29 March the Laboratory of Microbiology and Pathology, Brisbane, confirmed that 12 of the 13 pigs from Saibai with two sequential samples had seroconverted, that is there was at least a four-fold rise from a baseline HAI titre from <20 when the paired sera where tested in parallel. This finding was confirmed by PRNA. The pigs tested on Badu and Erub remained seronegative as did the sentinel pigs on Kiriri and the NPA. Thus there is clear evidence of JE virus activity on Saibai sometime during February - March 1996.

The immediate response was to inform the Saibai Council of the reappearance of JE virus in their community, and to reinforce the importance of personal protection measures (repellants, mosquito coils, bed nets etc.) to minimise the risk of mosquito bites. This response was extended to the two other northern islands - Boigu and Dauan. Although these two islands were not included in the surveillance, they are also very close to PNG and it can be assumed that the circumstances behind the reappearance of JE virus on Saibai are likely to apply to them as well.

The remaining communities of the outer Torres Strait were informed on 1 April, and advised to take similar precautions. Mosquito control activities have been in place in the Torres Strait throughout the wet season, and will be reinforced at Saibai and Boigu over the coming weeks. The sentinel pig surveillance system will be maintained over the coming months, and will possibly be expanded during the next wet season. Although vaccination has protected the majority of the outer island population, plans for ongoing elective vaccination (for example, of children who turn one year of age and therefore become eligible for vaccination) will need to be developed.

Reference

1. Hanna J, Ritchie S, Loewenthal M, *et al*. Probable Japanese encephalitis acquired in the Torres Strait. *Comm Dis Intell* 1995; 19:206-208.

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