Sentinel Chicken Surveillance Program in Australia, July 2002 to June 2003

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Abstract

Detection of flavivirus seroconversions in sentinel chicken flocks located throughout Australia is used to provide an early warning of increased levels of Murray Valley encephalitis (MVE) and Kunjin (KUN) virus activity in the region. During the 2002–2003 season low levels of flavivirus activity were detected in northern Australia compared to previous years. MVE and KUN virus activity was detected in the Kimberley and Pilbara regions of Western Australia and the Northern Territory but not in north Queensland, New South Wales or Victoria. This is similar to the previous season. There were no reported cases of disease caused by either virus. *Commun Dis Intell* 2003;27:367–369.

Keywords: encephalitis, flavivirus, Kunjin, Murray Valley encephalitis

Introduction

The Sentinel Chicken Surveillance Program is used to provide an early warning of increased flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin (KUN) viruses. MVE virus causes the disease Murray Valley encephalitis (formerly known as Australian encephalitis), a potentially fatal disease in humans. Encephalitis is less frequent in cases of Kunjin virus infection and these encephalitis cases have a lower rate of severe sequelae. These viruses are enzootic in the Kimberley region of Western Australia and in the Top End of the Northern Territory and possibly in Far North Queensland (Western Cape and Gulf country). They are epizootic in the Pilbara, Gascoyne and Midwest regions of Western Australia, central Australia and in western and central Queensland. MVE virus is also responsible for occasional severe epidemics of encephalitis in south-eastern Australia, the most recent occurring in 1974.

In the northern areas of Australia MVE and KUN virus activity varies depending on the extent and location of wet season rainfall and flooding in the region. MVE and KUN virus activity is monitored in Australia by detecting seroconversions in sentinel chicken flocks.[1] Since 1974, a number of sentinel chicken flocks have been established in five Australian States to provide an early warning of increased MVE and KUN virus activity. These programs are funded by the State health departments and each state has a contingency plan, which will be implemented if one or more chickens in a flock seroconverts to one of these viruses. From 1992 to 2001 the results of the state sentinel chicken programs were reported bimonthly in *Communicable Diseases Intelligence* (*CDI*). From 2002 onwards, important results were posted on the Communicable Diseases Australia website by each state and this report is a brief summary of the results obtained from each State program during the 2002–2003 season.

Currently, 31 flocks are maintained in the north of Western Australia, eight in the Northern Territory, six in New South Wales, 10 in Victoria and two in northern Queensland. The flocks in Western Australia and the Northern Territory were sampled and tested all year round but those in New South Wales and Victoria were tested only in the summer months, during the main MVE risk season. The Queensland flocks were tested weekly from January to June. All flock locations were presented earlier in *CDI*.[2] Additional details of the Australian sentinel chicken surveillance program has also been presented earlier in *CDI*.[1]

Summary of recent flavivirus activity in Australia

MVE and KUN virus activity is detected in Western Australia and the Northern Territory in most years. Activity in other areas is less regular. Record rainfall was recorded in the north of Australia during the 1999–2000 wet season and cases of Murray Valley encephalitis were reported from the Northern Territory, central Australia and Western Australia. Above average rainfall was recorded in central Australia in 2000–2001 and cases were again

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reported in the region. A single case was also reported from central Queensland. In 2000–2001 MVE activity was detected in New South Wales for the first time since 1974 but no cases were reported. Kunjin virus activity was also detected in New South Wales and Victoria in 2000–2001.

MVE and KUN virus activity was low in 2001–2002 with activity recorded only in Western Australia and the Northern Territory. Kunjin virus activity was reported from Western Australia, Northern Territory and northern Queensland.

Flavivirus activity in 2002–2003

Western Australia

Serum samples from the Western Australian sentinel chicken flocks are tested by the Arbovirus Surveillance and Research Laboratory at the University of Western Australia in Perth.

MVE activity was detected from July to September in the Kimberley and Pilbara regions in 2002, but this was a continuation of the previous season's activity. A localised warning was issued by the Mosquito-Borne Disease Control section at the Western Australia Department of Health (WADOH) for the Pilbara region in September.

Although there was above average summer rainfall (December to February) in most areas of the Kimberley in 2002–2003, flavivirus activity was considerably lower than last year and began later than usual in Western Australia. Antibodies to either MVE or KUN virus were only detected in a total of six chickens in the Kimberley region. There was only one seroconversion reported from Paraburdoo in the Pilbara region in May 2003. No human cases were reported.

MVE activity was first detected in February 2003 at Fitzroy Crossing in the West Kimberley and seroconversions to both MVE and KUN viruses were detected later in April and May at two sites (Kununurra and Kalumburu) in the north-east Kimberley. The WADOH issued a health warning to residents and visitors to the Kimberley in early March. An additional health warning was sent out to the Kalumburu community in May.

MVE activity was only detected at one site (Paraburdoo) in the Pilbara in May. In response to this, a health warning was issued in June 2003 by WADOH, to residents and visitors to the Pilbara region. No activity was detected further south or east in the Gascoyne, Murchison, Midwest, Goldfields and Wheatbelt regions in 2003.

Northern Territory

MVE activity is usually initiated later in the Northern Territory than in Western Australia. The flocks were bled monthly by veterinary officers of the Department of Business Industry and Resource Development and volunteers, and the serum samples were tested by staff of the Arbovirus Surveillance and Research Laboratory in Perth.

Flavivirus activity during the 2002–2003 wet season was lower in the Northern Territory than in the previous season. Kunjin virus activity was detected in August 2002 in the Darwin area, but this was probably a continuation of the previous season's activity (P Whelan, personal communication).

The first MVE seroconversion for this season was detected in April 2003 at Gove. MVE activity was also detected in the Darwin rural area in June. Media warnings were issued by the Northern Territory Department of Health and Community Services in early May from Maningrida to Groote Eylandt and late June for the general Top End.

KUN activity was detected at Katherine in May, at Gove from April to June, and at Tennant Creek in June. A media warning of the increase in KUN activity in the Northern Territory was issued in late May for Maningrida to Groote Eylandt.

No cases of disease caused by MVE or KUN virus were recorded in the Northern Territory during the 2002–2003 season. The lack of MVE activity in Alice Springs is thought to be partly due to an extensive insecticide application and drainage measures in Ilparpa swamp on the outskirts of Alice Springs, that were carried out in early 2002, and the below average summer rainfall for 2002–2003. The lack of MVE activity in the Alice Springs region was in accord with the predictions based on accumulated summer rainfall, with less than 100 mm of summer rain in Alice Springs this year, despite heavy November 2002 rain.[3]

North Queensland

The two sites in Queensland were monitored weekly for six months (January to June) and samples were tested by staff at Queensland Health Scientific Services. No flavivirus activity was detected.

New South Wales and Victoria

Samples from sentinel chicken flocks were tested weekly for flavivirus antibodies in New South Wales (Westmead Hospital) from December to April and in Victoria (Veterinary Research Institute) from October to March. In the 2002-2003 season no MVE or KUN virus activity was detected in this region.

Acknowledgements

The Sentinel Chicken Programs in each state are funded by the State health departments.

I thank Mr PI Whelan, Medical Entomology Branch, Department of Health and Community Services, Darwin for his advice on this report.

The following people have contributed to the Australian sentinel chicken program and I thank them for their help with this report. I apologise if I have missed anyone.

Mr J Azoulas, Veterinary Research Institute, Victoria; Dr D Dwyer, Virology Department, Westmead Hospital, New South Wales; Ms S Harrington, Mosquito-Borne Disease Control Branch, Western Australian Department of Health; Ms L Hueston, Virology Department, Westmead Hospital, New South Wales; Dr Cheryl Johansen, Arbovirus Surveillance and Research Laboratory, University of Western Australia, Ms Nina Kurucz, Medical Entomology Branch, Department of Health and Community Services, Darwin; Dr MD Lindsay, Mosquito-borne Disease Control Branch, Western Australian Department of Health; Ms Alyssa Pyke, Public Health Virology Laboratory, Queensland Health Scientific Services; Prof. JS Mackenzie, Department of Microbiology, University of Queensland; Dr L Melville, Berrimah Agricultural Research Centre, Darwin; Dr SA Ritchie, Cairns Tropical Public Health Unit, Queensland; Dr DW Smith, Division of Health Sciences, Western Australian Centre for Pathology and Research, Western Australia.

The following laboratories were responsible for testing sentinel chicken sera:

Arbovirus Surveillance and Research Laboratory, Discipline of Microbiology, University of Western Australia.

Public Health Virology Laboratory, Queensland Health Scientific Services

Virology Department, Westmead Hospital, New South Wales

Veterinary Research Institute, Victoria

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