



Australian Paediatric Surveillance Unit
STUDY INFORMATION SHEET
Japanese Encephalitis in Children

COMMENCED
MAY 2023

BACKGROUND

Japanese encephalitis virus (JEV) is an enveloped, positive sense, single-stranded RNA member of the Flaviviridae family that is transmitted to humans by mosquitoes [1,2]. Five genotypes, I through V, are recognized based on the nucleotide sequence of the envelope gene. Between 1870 and the mid-1990s, most infections were caused by genotype III. Infections caused by JEV genotype I have predominated during the last two decades. The recent emergence of genotype V in parts of China, Malaysia, and South Korea is an important reminder that more than one genotype can circulate simultaneously [3]. Most human infections with JEV are mild or completely asymptomatic but can result in encephalitis. Severe clinical illness is more common in children than in adults, occurring in approximately 1 of every 250 infections. The mortality is between 20%-30%. Between 30% and 50% of patients who survive JEV encephalitis suffer permanent neurologic, psychiatric, and/or cognitive deficits. Those who survive infection from any of the five JEV genotypes develop lifelong immunity against all genotypes.

In Australia, JEV predominantly affects overseas travellers returning from endemic regions [1]. However, in 1995, JEV was first recognized in natural transmission cycles in northern Australia when a widespread outbreak occurred on the islands of the Torres Strait. On the Island of Badu, there were three human cases of which two were fatal [2]. In 1998, JEV again appeared in the Torres Strait, with two clinical cases, one was a child.

On March 4, 2022, Japanese encephalitis was identified as a “communicable disease incident of national significance” in Australia, following the detection of Japanese encephalitis virus (JEV) in mummified, stillborn, and weak newborn piglets from multiple commercial piggeries. Human cases of Japanese encephalitis were identified across five Australian states (Queensland, New South Wales, Victoria, South Australia, and the Northern Territory (Figure 1) affecting 42 individuals with seven deaths (19 October, 2022) [4; www.health.gov.au/health-alerts/japanese-encephalitis-virus-jev/about].

In the most recent outbreak, the sentinel case was a 45-year-old resident of the Tiwi Islands (located 80 km north of Darwin on the Northern Territory coast (Figure 1)) who presented with a two-day history of acute confusion and fever [4]. The patient developed progressive neurologic deterioration and died 15 days after admission.

Subsequently, a complete JEV genome sequence that was obtained from thalamus tissue which suggested that the virus belonged to genotype 4 and was closely related to the 2022 Southeast Australian outbreak strains (>99.7% nucleotide identity) in samples obtained from pigs, humans, and mosquitoes [5]. The most likely reason for the recent 2022 South-Eastern outbreak is related to unusual weather events that resulted in the extended migration of infected water birds from Northern Australia down the eastern coast [6]. Surveillance and monitoring of piggeries in New South Wales and Victoria is ongoing.

OBJECTIVES

1. To identify cases of Japanese Encephalitis infection in Australian children aged 17 years or younger seen by paediatricians.
2. To describe Japanese Encephalitis in children, including demographics, clinical features and severity, treatment; and short-term outcomes.

CASE DEFINITION

Please report any newly diagnosed case of Japanese Encephalitis in any child aged less than 18 years with:

1) acute onset of symptoms consistent with Japanese Encephalitis (e.g. high fever, rigors, headache, weakness, vomiting, diarrhoea, and seizures);

OR

2) later stage symptoms/signs (e.g., altered mental status, hemiplegia, tetraplegia, cranial nerve palsies);
AND

3) Laboratory IgM antibody confirmation of JEV infection.

INVESTIGATOR CONTACT DETAILS

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