Japanese encephalitis

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MEMBERS OF THE AUSTRALIAN DEFENCE FORCE are exposed to a variety of risks when they deploy abroad. One of these risks is Japanese encephalitis, a potentially fatal mosquito-borne disease endemic in many areas to which ADF personnel deploy. Japanese encephalitis is the most common form of viral encephalitis in Asia, including Japan, Korea, China, India, Thailand, Indonesia, Malaysia, Vietnam, Taiwan and the Philippines.

The virus that causes Japanese encephalitis is carried by several species of culicine mosquitoes, and is transmitted to a human when an infected mosquito sucks that person's blood. Japanese encephalitis is not transmitted from person to person, although transplacental transmission has been observed.

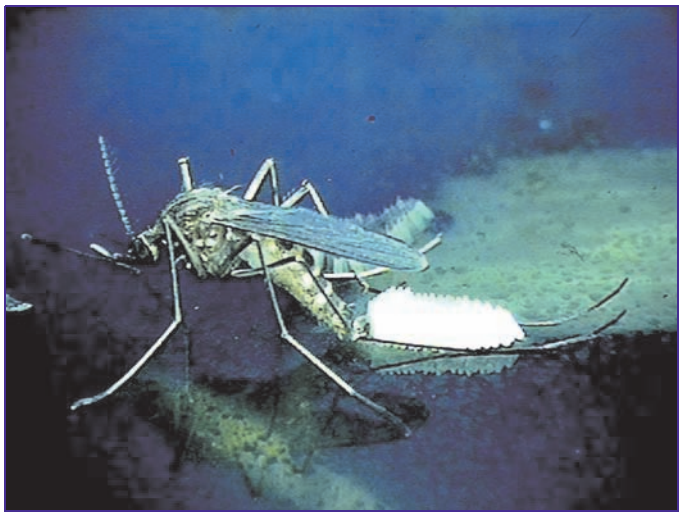
The virus usually propagates at the site of the bite and in regional lymph nodes. Subsequently, viraemia develops, leading to inflammatory changes in the heart, lungs, liver and reticuloendothelial system. Most infections are cleared before the virus can invade the central nervous system, leading to subclinical disease. However, neurological invasion can develop and involve large areas of the brain, including the thalamus, basal ganglia, brain stem, cerebellum, hippocampus, and cerebral cortex.

Japanese encephalitis is a seasonal disease, with most cases occurring in temperate areas from June to September. Further south in subtropical areas, transmission begins as early as March and extends until October. Transmission may occur all year in some tropical areas (eg, Indonesia).

Symptoms and outcomes

The virus has an incubation period of 5–15 days. Most people infected with the virus never become sick, but approximately one in 200–300 infections results in severe disease characterised by rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis, and death. The case-fatality rate can be as high as 60% among those with disease symptoms. About 30% of those who survive suffer from lasting damage to the central nervous system, resulting in:

- movement difficulties, where the arms, legs, or body jerk or writhe involuntarily;
- shaking;
- paralysis;
- inability to control emotions;
- loss of mental abilities; and
- mental disturbances, including schizophrenia (which may affect 75% of Japanese encephalitis survivors).



A culicine mosquito

Young children are most likely to have serious, long-term problems after an infection.

Diagnosis and treatment

The diagnosis is made primarily on the basis of the symptoms and knowledge of the illnesses endemic to a particular geographic region. Most diagnostic techniques for Japanese encephalitis do not yield results very quickly.

There are no treatments to stop or slow the progression of Japanese encephalitis. Only the symptoms can be treated. Fluids are given to decrease dehydration, and medications are given to decrease fever and pain. Medications are available to attempt to decrease brain swelling. Patients in a coma may require mechanical assistance with breathing.

Vaccination for Japanese encephalitis

A three-dose vaccine is available for Japanese encephalitis. Doses of the vaccine on Days 0, 7 and 30 are required for good protection. The vaccine is commonly given to young children in areas where the disease is endemic. Travellers to these regions can also receive the vaccine. In addition to vaccination, visitors to regions with high rates of Japanese encephalitis should take precautions (like using mosquito repellents and sleeping under a bed net) to avoid contact with mosquitoes.

The vaccination regimen should ideally commence 6 weeks before departure. An abbreviated schedule of Days 0, 7 and 14

can be used if time constraints do not permit the longer schedule. The last dose should be given at least 10 days before travel to ensure an adequate immune response and access to medical care in the event of a delayed adverse reaction. The vaccine can be safely given alone or with other vaccines. However, the vaccination regimen should be complete before commencing chloroquine as an antimalarial drug.

The vaccine is given by subcutaneous injection into the fatty layer beneath the skin, and 99% of people given the primary three doses over a 30-day period are protected. The dosage is 1.0 mL for adults and children older than 3 years and 0.5 mL for children between 1 and 3 years of age.

If the disease risk continues, then a booster dose should be considered every 2–3 years.

Personnel may suffer a reaction after receiving the vaccine. Reactions usually occur within 48 hours. They occur most quickly after the second dose. Typical reactions include:

- tenderness, redness and swelling at the injection site (20%);
- headache, fever, muscle aches, chills, dizziness, nausea, vomiting or abdominal pain (10%); and
- wheezing, facial swelling, hives or itching (0.1%–0.2%).

People receiving the vaccine should remain at the clinic for 30 minutes after receiving the dose.

The vaccine contains thimerosal, mouse serum protein, formaldehyde and gelatin. Anyone who has had a life-threatening allergic reaction to this vaccine or any of the vaccine components (eg, thimerosal or rodent protein) should not receive the vaccine. Caution should be used for people with a history of allergic reaction to Hymenoptera envenomation, drugs or any other cause. Personnel who receive the vaccine should avoid alcohol consumption for 48 hours following vaccination.

The vaccine should not be routinely administered during pregnancy. However, because infection acquired during pregnancy carries the potential for intrauterine infection and miscarriage, the risk of infection to the mother and developing fetus should be weighed against the theoretical risks of vaccination for pregnant women who will travel to areas where Japanese encephalitis is prevalent.

Vaccination and the ADF

Vaccinations within the ADF are aimed at protecting health and enhancing the overall effectiveness of personnel, to ensure preparedness of individuals and units for operational service, particularly overseas. Vaccinations help prevent the spread of diseases, and protect against diseases considered a risk for operational deployments, including biological weapons. Therefore, ADF personnel may require protection against a number of infectious diseases to be fit for deployment. Specific vaccinations may be required in response to specific perceived threats. Japanese encephalitis vaccine is one such example.

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