CONDITION

Japanese B encephalitis

Japanese B encephalitis is a mosquito-borne viral infection that can cause serious inflammation of the brain.

WHAT IT IS
Mosquito-borne viral inflammation of the brain

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Fever, headache, confusion, seizures

WHAT CAUSES IT
Infection with Japanese encephalitis virus

HOW IT IS DIAGNOSED
Antibody testing of blood and spinal fluid

MAIN TREATMENT
Supportive hospital care and rehabilitation

CAN IT BE CURED?
No - no treatment removes the virus

IS IT AN EMERGENCY?
Sometimes - confusion, seizures, or reduced consciousness

LONG-TERM OUTLOOK
Most infections silent; encephalitis can cause lasting disability

Overview

Japanese B encephalitis is now usually called Japanese encephalitis , or JE. It is caused by Japanese encephalitis virus, which is spread through the bites of infected mosquitoes.

The virus occurs mainly in parts of Asia and the western Pacific. It is maintained in a cycle between mosquitoes and animals, especially pigs and water birds. People are sometimes infected when a mosquito carrying the virus bites them. The infection does not normally spread directly from one person to another.

Most infected people have no symptoms. Some develop a short illness with fever and headache. Fewer than 1 in 100 infected people develop encephalitis, which means inflammation of the brain. Although this is uncommon, it can be life-threatening and may leave lasting problems with movement, thinking, speech, or seizures.

Risk is usually low for short visits to cities. It is higher with longer stays or repeated travel in affected areas, particularly where there are rice fields, wetlands, pig farming, and many mosquitoes. Vaccination and protection from mosquito bites can reduce the risk.

Symptoms

Symptoms usually begin about 5 to 15 days after an infected mosquito bite. It is not possible to identify Japanese encephalitis from symptoms alone because several other infections can cause a similar illness.

Most infections cause no noticeable symptoms. A mild infection may cause:

When encephalitis develops, symptoms can become more serious over hours or days. They may include:

Seizures are particularly common in children with encephalitis. Young children may instead seem unusually sleepy, irritable, difficult to wake, or unwilling to feed.

These symptoms need urgent assessment. Other conditions, including meningitis, malaria, stroke, and different forms of viral encephalitis, can look similar and may need immediate treatment.

- Fever
- Headache
- Tiredness
- Nausea or vomiting
- High fever and severe headache
- Confusion, unusual behaviour, or difficulty staying awake
- Neck stiffness
- Seizures
- Weakness or paralysis
- Problems speaking, swallowing, or coordinating movement
- Tremor, stiffness, or other abnormal movements
- Loss of consciousness

Causes and risk factors

Japanese encephalitis virus belongs to the flavivirus family, which also includes dengue, yellow fever, and West Nile viruses.

Certain mosquitoes, mainly Culex species, pick up the virus after feeding on infected pigs or water birds. An infected mosquito may then pass the virus to a person through a later bite. People usually do not carry enough virus in their blood to continue the mosquito-to-human cycle.

Japanese encephalitis occurs across much of Asia and parts of the western Pacific. Patterns differ by place. In some tropical areas, transmission can happen throughout the year. In temperate areas, it is often more common during warmer or rainy months.

Factors that can increase exposure include:

A brief trip does not automatically mean that you are at high risk. Your exact risk is shaped by where you go, the season, how long you stay, your activities, and where you sleep.

- Living in or visiting a region where the virus is present
- Staying for a month or longer in an affected area
- Spending time in rural or agricultural areas
- Outdoor activity during evening or night, when many Culex mosquitoes feed
- Sleeping without effective screens, air conditioning, or mosquito nets
- Frequent or repeated travel to affected regions
- Visiting during a local outbreak or transmission season

Diagnosis

Japanese encephalitis cannot be confirmed from symptoms or a brain scan alone. Doctors consider it when someone has encephalitis and has recently lived in or travelled to an area where the virus circulates.

Diagnosis usually includes a lumbar puncture . During this procedure, a small sample of cerebrospinal fluid-the clear fluid around the brain and spinal cord-is collected from the lower back. Blood is also tested.

The main laboratory test looks for IgM antibodies against Japanese encephalitis virus in blood or cerebrospinal fluid. IgM antibodies are immune proteins that appear in response to a recent infection. Testing very early in the illness can be negative, so another sample may sometimes be needed.

Related viruses can cause antibodies that react in similar ways. Specialist laboratories may

therefore use a neutralisation test to help confirm the result. Vaccination against Japanese encephalitis or another flavivirus can also affect how antibody results are interpreted.

Other tests help assess the brain and rule out alternative causes. These may include:

- MRI or CT scans of the brain
- An electroencephalogram, or EEG, which records electrical brain activity
- Blood tests for other infections and organ function
- Tests for malaria, meningitis, or other forms of encephalitis

Treatment and management

There is no specific antiviral treatment proven to remove Japanese encephalitis virus. Treatment focuses on supporting the body, protecting the brain, and managing complications while the immune system responds to the infection.

People with encephalitis usually need hospital care. Treatment may involve:

Some people need care in an intensive care unit, particularly if consciousness, breathing, or repeated seizures are concerns.

Recovery support may continue after the acute infection has settled. Physiotherapy can help with strength, balance, and movement. Occupational therapy focuses on daily activities and independence. Speech and language therapy can help with speech, communication, and swallowing.

People affected by memory, mood, behaviour, or learning changes may benefit from psychological care, neuropsychological assessment, or educational support. The rehabilitation plan is based on the problems that remain rather than on the infection alone.

- Oxygen or breathing support
- Fluids and nutrition
- Medicines to control seizures
- Treatment for fever, pain, or nausea
- Monitoring and management of pressure or swelling in the brain
- Prevention of problems caused by immobility or difficulty swallowing

Complications

Japanese encephalitis involving the brain can be severe. The World Health Organization reports that about 20% to 30% of people who develop encephalitis die from it. Among survivors, about 30% to 50% may have lasting neurological, cognitive, or behavioural difficulties.

Possible complications include:

Difficulty swallowing can allow food or liquid to enter the lungs, causing aspiration pneumonia. Reduced movement can also contribute to blood clots, pressure injuries, and loss of muscle strength.

Not everyone who develops encephalitis has permanent disability. Some people recover well, while others need long-term assistance. The severity of the initial brain inflammation and the areas of the brain affected can influence recovery.

- Ongoing weakness or paralysis
- Tremor, stiffness, or slowed movement
- Recurrent seizures or epilepsy
- Problems with memory, attention, or planning
- Speech or swallowing difficulties
- Changes in mood, personality, or behaviour
- Hearing or vision problems
- Learning or developmental difficulties in children

Prevention

Japanese encephalitis can often be prevented, although no measure removes all risk.

Vaccines are available and are used routinely in many places where the infection is common. For travellers, vaccination is generally recommended for longer stays in affected regions and may be considered for shorter trips involving substantial rural, outdoor, or nighttime exposure. It is not usually recommended for brief travel limited to urban areas with low exposure.

A travel health professional can assess the itinerary, season, length of stay, planned activities, and personal medical circumstances. This should ideally happen well before travel because vaccination may require more than one appointment.

Whether or not you are vaccinated, reduce mosquito bites by:

Vaccination is not 100% effective, so mosquito protection remains important. Japanese encephalitis is not usually caught through food, drinking water, touching pigs, or ordinary

contact with an infected person.

- Using an effective insect repellent according to its label
- Wearing long sleeves, long trousers, and closed shoes
- Choosing screened or air-conditioned rooms when possible
- Sleeping under a mosquito net where rooms are not well screened
- Treating clothing or equipment with an appropriate insecticide where recommended
- Taking extra care from evening through night, when many carrier mosquitoes bite

Living with it and what to expect

People who have no symptoms generally do not know they were infected and do not develop ongoing problems. A mild fever illness may settle without lasting effects.

Encephalitis has a less predictable course. The first days may involve rapid changes in alertness, seizures, or movement. Once the infection and brain inflammation are controlled, recovery often shifts toward rehabilitation.

Some improvements may happen over weeks and months as swelling settles and the brain recovers. Strength, speech, attention, and daily skills can continue to improve with practice and therapy. Recovery is not always steady; fatigue and temporary setbacks are common during rehabilitation.

Some effects can last for years or become permanent. A person may look physically recovered but still have difficulty with memory, concentration, emotional control, or planning. Children may need follow-up because learning or developmental problems can become clearer as school demands increase.

Routine follow-up may include neurological review, seizure monitoring, hearing or swallowing assessment, and rehabilitation. Support at school or work can help someone return gradually and safely. Family members may also need guidance if behaviour, communication, or care needs have changed.

The infection does not become a long-term contagious state. Ongoing symptoms result from the brain injury caused during the acute illness, not from spreading the virus to other people.

When to get medical help

Seek emergency medical help for:

Do not wait for a routine appointment when signs of encephalitis are present. Tell the emergency team about recent travel, including countries visited, rural stays, mosquito exposure, and travel dates.

Arrange prompt medical assessment for a fever or worsening headache during or after travel in a region where Japanese encephalitis occurs. These symptoms are more often caused by something else, but other travel-related infections may also need testing.

Routine follow-up is appropriate after hospital discharge to review recovery, medicines, seizures, swallowing, mood, memory, movement, and support needs. New neurological symptoms during recovery should be assessed promptly rather than left until the next planned visit.

- New confusion or unusual behaviour
- Difficulty waking or loss of consciousness
- A seizure, especially a first seizure or one that does not stop
- Sudden weakness, paralysis, or difficulty speaking
- Severe headache with fever, neck stiffness, or repeated vomiting
- Breathing difficulty or blue or grey lips

Common questions

Is Japanese B encephalitis the same as Japanese encephalitis?

Yes. Japanese B encephalitis is an older name. Japanese encephalitis, often shortened to JE, is now the usual term.

Can I catch it from another person?

Ordinary person-to-person spread does not occur. The virus is mainly passed through bites from infected mosquitoes. Caring for or living with an affected person does not usually put you at risk.

How likely am I to get sick after an infected mosquito bite?

Most infections cause no symptoms, and fewer than 1 in 100 infected people develop encephalitis. Individual exposure risk is influenced by destination, season, trip length, accommodation, and time spent outdoors.

Do I need a Japanese encephalitis vaccine for travel?

Not every traveller needs it. Vaccination is more relevant for longer stays, repeated travel, rural exposure, outdoor nighttime activity, or travel during an outbreak. A travel health assessment

can match advice to your itinerary.

Can Japanese encephalitis come back after recovery?

The original infection is not usually a relapsing infection. However, seizures, movement problems, fatigue, memory changes, or other effects of the brain injury may continue or become noticeable during recovery.

Can Japanese encephalitis be cured?

There is no medicine that directly clears the virus. Hospital support and treatment of complications give the body time to recover. Rehabilitation can improve function, but some people have lasting effects.

Sources

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- Hills SL, Walter EB, Atmar RL, Fischer M. Japanese Encephalitis Vaccine: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recommendations and Reports. 2019;68(2):1-33.