



Mosquito-Borne Illnesses

QML Pathology.

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Mosquito-Borne Illnesses

After the recent heavy rainfall in Queensland, we are expecting a surge in mosquito-borne illnesses. The common mosquito-borne illnesses are Ross River virus and Barmah Forest virus, which are widespread in Australia, whereas dengue fever is confined so far to North Queensland. The heavy rains have led to flooding in some parts of Queensland, and water clogging and accumulation of water around residential areas, which are perfect breeding grounds for mosquitoes.

Ross River Virus (RRV)

Ross River virus is a mosquito-transmitted arbo/alphavirus that causes disabling polyarthritis and arthralgias. It is Australia's most common arbovirus with about 5000 cases notified every year. It is endemic throughout Australia, including the major metropolitan areas.

Risk factors for outbreaks include higher rainfalls. In Northern Australia most cases occur during the months January to April. Kangaroos and wallabies are the main reservoir hosts of RRV. During epidemics, human mosquito-human transmission has almost certainly occurred.

Clinical Symptoms:

RRV affects most commonly adults aged 25–44 years. Males and females are equally affected. The incubation period is generally 7–9 days. Subclinical infection probably occurs in up to 30% of those infected.

Onset is usually acute with headache, lethargy and generalised aches and pains, followed by acute polyarthritis, which is often migratory. The rash can take several forms but most commonly maculopapular and may precede or follow the appearance of arthritis by several days. It may be localised or widespread, sparse or dense and may appear on any part of the body.

The duration of symptoms are variable, many patients can be incapacitated for 5-6 weeks. Full recovery takes much longer and joint symptoms are present for a year or more in about 25% of cases. Relapses of arthritis and fatigue occasionally occur. Infection with RRV probably confers lifelong immunity.

Diagnosis:

Serology for RRV- IgG and IgM is available through QML Pathology. A seroconversion or a four-fold rise in IgG antibody titre is diagnostic of recent infection. Detection of RRV specific IgM is suggestive of recent infection but false positives can occur, and sometimes IgM can persist for months to years after infection.

Treatment:

Treatment is symptomatic with rest advisable in the acute stage.

Preventive Measures:

Infection can be prevented by personal protection measures (long sleeves and pants, mosquito repellents) and avoidance of mosquito prone areas. Vectors bite between dusk and dawn.

Barmah Forest Virus (BMF)

Barmah Forest virus is another mosquito borne alpha/arbovirus that causes a very similar illness to RRV with less severe joint involvement and more frequent and more florid rash.

Diagnosis:

Diagnosis can be made by serology.

Treatment:

Treatment is symptomatic, and infection probably confers lifelong immunity.

Dengue Fever

Dengue is a mosquito-borne Flavivirus infection. Any one of the four serotypes of dengue virus can cause the illness. In Australia, dengue is currently limited by the distribution of its vector to Northern Queensland. Dengue is not endemic in Queensland, however, the vector, *Aedes aegypti* is common in North Queensland, with outbreaks manifesting yearly.

Clinical Features:

The incubation period is usually 3-7 days. Clinical manifestations of dengue fever vary from asymptomatic infection to serious disease. Dengue fever is usually characterised by an abrupt onset fever, rash, muscle and joint pains, headaches and severe prostration, especially in adults. The fever has a characteristic pattern of 'saddle back temperature curve', i.e., the fever falls after about 48-96 hours only to return 24 hours later.

The maculopapular rash usually appears 2-6 days after onset (varying from macular papular to confluent petichial). The rash can cover the entire body sparing palms and soles or can be patchily distributed over trunk and extremities. The skin can be very itchy. Loss of appetite, nausea, vomiting, diarrhoea and abdominal pain are other common complaints. The acute febrile phase usually lasts 5-7 days.

Dengue haemorrhagic fever (DHF) is a severe immune mediated complication of dengue virus infection occurring in up to 1% of cases. The onset is the same as dengue, but after 4-5 days there is a sudden deterioration with haemorrhage and/or shock. The mortality rate for untreated DHF is 1-5%.

People with a history of dengue infection from another serotype and individuals with a certain genetic profile are more likely to develop DHF if infected with the virus. Leukopenia, thrombocytopenia and elevated hepatic transaminases are frequently seen.

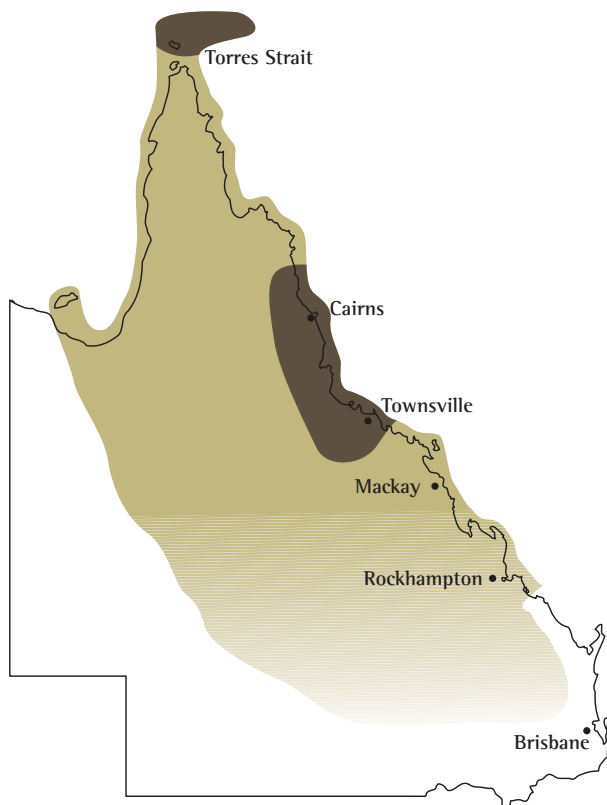


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Distribution Of *Aedes aegypti* and Dengue Activity In Queensland



- Dengue activity in Queensland since 1990
- Distribution of *Aedes aegypti* in Queensland

Reference: 'Dengue Fever Management Plan for North Queensland 2005-2010'
[<http://www.health.qld.gov.au/dengue/documents/29071a.pdf>]

Dengue Fever (Continued)

Laboratory Testing:

- **Dengue Serology**

QML Pathology offers dengue IgG and IgM antibody testing. Serum IgM appears after 4–5 days of infection. Serum IgG does not become positive until about the seventh day of the illness. A patient whose serum is IgG positive for dengue early in their illness has probably been previously exposed to another serotype of dengue. Cross-reactivity between other Flavivirus IgG may occur.

- **Serum Dengue PCR**

Dengue PCR on a blood sample should be requested if the patient presents early in the illness. Rapid diagnosis is important to prevent local spread in receptive areas.

This test can detect dengue virus up to day 5 of the illness and should be ordered in suspected cases as early as possible in the course of the illness.

Treatment:

Treatment is symptomatic, with paracetamol for fever, and adequate hydration. Aspirin, ibuprofen or NSAIDs should not be given as it can aggravate bleeding.

All patients with DHF need to be hospitalised for fluid therapy and monitoring.

Advise mosquito avoidance measures (repellents) for 12 days post onset in areas where the vector is prevalent to prevent the virus being transmitted to mosquitoes. Mosquitoes are most active during daylight hours.



Dr Shalinie Perera FRCPA **Consultant Microbiologist**

Dr Shalinie Perera obtained an MD in microbiology in 2001 and her FRCPA in 2008. Dr Perera worked as a Consultant Microbiologist from 2003 - 2008 at Sri Jayawardenapura General Hospital, Sri Lanka, and as a Registrar in Microbiology at PathWest Laboratory Medicine, Sir Charles Gairdner Hospital, WA from January 2007 to 2008. Dr Perera then worked at the Fremantle Hospital before joining QML Pathology in 2009.

Phone: (07) 3121 4074 Email: Shalinie.Perera@qml.com.au