

**BARMAH FOREST VIRUS**



*“Child Playing at the River Edge”, oil on canvas, 1980, David Boyd*

*“The pursuit of truth and beauty is a sphere of activity in which we are permitted to remain children all our lives”.*

*Albert Einstein*

## **BARMAH FOREST VIRUS**

### Introduction

**Barmah Forest virus** is an **arbovirus**, i.e. a virus which is transmitted via the bite of an arthropod, in this case a **mosquito**.

Barmah Forest virus is an **alphavirus**.

The Barmah Forest virus was first isolated in 1974 from **Culex annulirostris mosquitoes** collected in the Barmah Forest near the Murray River in northern Victoria.

All the infective alphaviruses essentially cause a similar disease pattern in humans, and are principally characterized by:

1. Fever
2. Joint involvement
3. Rash.

There is no current vaccine available and no *specific* treatment and so treatment is entirely supportive

### Terminology:

The study of place names is called **toponymy** (from the Greek words topos “place” and onoma “name”).

Place names are important to every culture because they contain a wealth of historical, cultural and linguistic information and also serve to label events and incidents associated with them. Diseases and pathogens not uncommonly carry the names of places associated with their discovery.

**Ross River** as well as **Hendra, Bairnsdale, Murray Valley** and **Barmah Forest** are all examples of Australian places that have had diseases named after them.

The positive aspect to toponymy is that it can add a unique and interesting story that provides a glimpse into discovery, history and culture.

The negative aspect, of course is that *locals* prefer not to have their region named after a disease! The first written records of an outbreak of syphilis in Europe occurred in 1494 in Naples during a French military invasion of that city. The people of Naples claimed that it was spread by French troops and so they called it the “French disease”, to which the French took great offense, and responded by calling syphilis the “Neapolitan disease”.

In 1918 the Influenza pandemic was commonly referred to as the “Spanish flu”, a great source of irritation to the Spanish, particularly as the exact origins of the influenza virus

were essentially unknown, though the troops of World War I, a conflict in which Spain was neutral, were probably responsible for its rapid dissemination across the globe

## History

Barmah Forest virus was first isolated in 1974 from **Culex annulirostris** mosquitoes collected in the Barmah Forest near the Murray River in northern Victoria, and simultaneously from mosquitoes collected in south-west Queensland.

The first documented case of human disease with this virus was in 1986

## Epidemiology

Barmah Forest virus disease is considered endemic throughout **Victoria**. Outbreaks in particular have been reported in Victoria throughout the Murray Valley and the Gippsland area.

In Victoria, the number of notified cases per year varies widely depending on seasonal and other conditions

Since 1988, it has also been reported in **Western Australia, Queensland, New South Wales** and the **Northern Territory**.

It has been detected in most parts of mainland Australia, and serological surveys indicate that it causes widespread human infection.

The 5 year median for the period 2005 - 2009 was 26 notifications per year.

As of 2015, the virus has only been found in Australia.

## Pathology

### Organism

**Arboviruses** are viruses that are spread by the bite of arthropods, particularly mosquitoes.

They are divided into:

1. **Alphaviruses:**

There are four infective alphaviruses including:

- Ross River virus
- **Barmah Forest virus**
- Sindbis virus

- Chikungunya virus.
2. Flaviviruses.
- Murray Valley encephalitis virus
  - Dengue virus

The alphaviruses are a group of small enveloped single-strand positive-sense RNA viruses.

### Reservoir

- Like Ross River virus disease, Barmah Forest virus disease appears after heavy rains that facilitate the breeding of mosquito vectors.
- It is not established, but it is likely, that macropods and other marsupials are the principal hosts for the virus.
- Barmah Forest virus antibodies have been found in kangaroos, cattle, horses and sheep on the south coast of New South Wales.

### Transmission

Barmah Forest virus is transmitted by the **bite of infected mosquitoes.**

A number of different species can transmit the Barmah Forest virus.

In Australian inland areas the principal vector is:

- **Culex annulirostris**

In coastal regions the principal vector is:

- **Ochlerotatus vigilax** in New South Wales
- **Ochlerotatus camptorhynchus** in the southern parts of Victoria and Tasmania

These vectors are well established in Australia.

### Incubation Period

- The incubation period is around 7 - 10 days.

### Period of communicability

- There is no evidence of direct transmission of Barmah Forest virus from person to person.

### Susceptibility & resistance

- Infection with Barmah Forest virus is thought to confer lifelong immunity.

### Clinical Features

The clinical manifestations of BFV disease are similar other arthropod born Alphavirus infections and so may include:

1. Fever
2. Non-specific constitutional symptoms:
  - Lethargy
  - Malaise
  - Anorexia
  - Headache
  - Myalgias
3. Joint involvement:
  - Rheumatic symptoms

These consist of arthritis or arthralgia, primarily affecting the:

  - ♥ Wrists
  - ♥ Knees
  - ♥ Ankles
  - ♥ Small joints of the extremities.
4. Rash:
  - The rash is variable in:
    - ♥ Distribution

- ♥ Character
- ♥ Duration, (but usually around 7 -10 days)

As in Ross River virus disease, there is a high subclinical rate of infection and low disease rates in children.

Recovery usually occurs within several weeks, but lethargy, arthralgia and myalgia can persist for over **6 months**.

Outbreaks of BFV disease sometimes occur *concurrently with Ross River virus disease*, making specific diagnosis difficult.

### Investigations

1. Serology:
  - A fourfold or greater rise in titer to Barmah River Virus IgG
  - The presence of Barmah River Virus IgM, in the absence of Ross River virus IgM, unless BFV IgG is also detected
2. PCR testing for Barmah River Virus

### Management

#### Prevention

There is no current vaccine available for the Barmah Forest Virus.

The chances of infection can be reduced by avoidance of mosquitoes bites by usual means such as:

- The wearing of long, loose-fitting clothes
- The use effective insect repellents in mosquito-prone areas.
- Avoiding mosquito-prone areas, especially at dusk and dawn when mosquitoes are more active and likely to bite.

#### Treatment

There is no specific treatment and this is essentially symptomatic only.

Simple analgesia such as Aspirin, NSAIDs, or paracetamol are usually sufficient to control symptoms.

*Notification:*

Barmah Forest virus as well as other arbovirus infections (Group B diseases) require notification in writing within 5 days of diagnosis.

*School exclusion:*

School exclusion is not required.

*References*

1. Barmah Forest Virus in Bluebook Website, Accessed July 2017

Dr J. Hayes.  
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