



# PREVENTION AND CONTROL OF DENGUE FEVER AND DENGUE HEMORRHAGIC FEVER

## Public Awareness Program, Pakistan Islamic Medical Association

### Introduction

Dengue is the most widespread mosquito-borne infection in human beings, which in recent years has become a major international public health concern. It is usually found in tropical and sub-tropical regions around the world, particularly in urban and semi-urban areas. Over the last 15 years, we have witnessed a dramatic increase in the global incidence of dengue and its severe manifestations

such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Almost 95% of Dengue cases are amongst children under the age of 15 years. Without proper management, Dengue Hemorrhagic Fever case fatality rates can exceed 20%, however, with modern intensive supportive therapy these rates can be reduced to less than 1%.

### Transmission

Dengue viruses are transmitted to humans through the bite(s) of infective female *Aedes Aegypti* mosquitoes, which generally acquire the virus while feeding on the blood of an infected person. After incubation for 8-10 days, an infected mosquito is capable, during probing and blood feeding, of transmitting the virus, to susceptible individuals for the rest of its life. Infected female mosquitoes may also transmit the virus to their offspring by transovarial (via the eggs) transmission.

Humans are the main amplifying host of the virus, although studies have shown that in some parts of the world monkeys may become infected and perhaps serve as a source of virus for uninfected mosquitoes. The virus circulates in the blood of infected humans for 2-7 days, at approximately the same time as they have fever *Aedes Aegypti* mosquitoes may acquire the virus when they feed on an individual during this period.

### Signs and symptoms

Typically, people infected with dengue virus are asymptomatic (80%) or only have mild symptoms such as an uncomplicated fever. Others have more severe illness (5%), and in a small proportion it is life-threatening. The incubation period (time between exposure and onset of symptoms) ranges from 3–14 days, but most often it is 4–7 days. Therefore,

travelers returning from endemic areas are unlikely to have dengue if fever or other symptoms start more than 14 days after arriving home. Children often experience symptoms similar to those of the common cold and gastroenteritis (vomiting and diarrhea), but are more susceptible to the severe complications.

### Clinical course

The characteristic symptoms of dengue are sudden-onset fever, headache (typically located behind the eyes), muscle and joint pains, and a rash. The alternative name for dengue, "break-bone fever", comes from the associated muscle and joint pains. The course of infection is divided into three phases: febrile, critical, and recovery.

The febrile phase involves high fever, often over 40 °C (104 °F), and is associated with generalized pain and a headache; this usually lasts two to seven days. At this stage, a rash occurs in approximately 50–80% of those with symptoms. It occurs in the first or second day of symptoms as flushed skin, or later in the course of illness (days 4–7), as a measles-like rash. Some petechiae (small red spots that do not disappear when the skin is pressed, which are caused by broken capillaries) can appear at this point, as may some mild bleeding from the mucous membranes of the mouth and nose. The fever itself is classically biphasic in nature, breaking and then returning for one or two days, although there is wide variation in how often this pattern actually happens.

In some people, the disease proceeds to a critical phase, which follows the resolution of the high fever and typically lasts one to two days. During this phase there may be significant fluid accumulation in the chest and abdominal cavity due to increased capillary permeability and leakage. This leads to depletion of fluid from the circulation and decreased blood supply to vital organs. During this phase, organ dysfunction and severe bleeding, typically from the gastrointestinal tract, may occur. Shock (dengue shock syndrome) and hemorrhage (dengue hemorrhagic fever) occur in less than 5% of all cases of dengue, however those who have previously been infected with other serotypes of dengue virus ("secondary infection") are at an increased risk.

The recovery phase occurs next, with resorption of the leaked fluid into the bloodstream. This usually lasts two to three days. The improvement is often striking, but there may be severe itching and a slow heart rate. During this stage, a fluid overload state may occur; if it affects the brain, it may cause a reduced level of consciousness or seizures.

## Associated problems

Dengue can occasionally affect several other body systems, either in isolation or along with the classic dengue symptoms. A decreased level of consciousness occurs in 0.5–6% of severe cases, which is attributable either to infection of the brain by the virus or indirectly as a result of impairment of

vital organs, for example, the liver. Other neurological disorders have been reported in the context of dengue, such as transverse myelitis and Guillain-Barré syndrome. Infection of the heart and acute liver failure are among the rarer complications.

## Prevention and control measures

Presently, the only method of controlling or preventing DF and DHF is to combat the vector mosquitoes. *Aedes Aegypti* breeds primarily in man-made containers like earthenware jars, metal drums and concrete cisterns used for domestic water storage, as well as discarded plastic food containers, used automobile tyres and other items that collect rainwater.

**Vector control** is implemented using environmental management and chemical methods. Proper solid waste disposal and improved water storage practices, including covering containers to prevent

access by egg laying female mosquitoes, are encouraged through community-based programmes.

The application of appropriate insecticides to larval habitats, particularly those used by the households, such as water storage vessels can prevent mosquito breeding for several weeks therefore these insecticides must be used periodically. The use of family size insecticide treated nets (ITNs) is also recommended. General insecticide spraying targeting mosquito breeding habitats need to be carried out to kill adult mosquitoes using portable or truck-mounted machines.

## Guidelines for the families of affected persons

Keep body temperature below 39°C. Give the patient paracetamol (not more than four times in 24 hours) according to the dose prescribed below:

| Age         | Dose (tablet 250 mg) | Mg/dose |
|-------------|----------------------|---------|
| < 1 year    | ¼ tablet             | 60      |
| 1-4 years   | ½ tablet             | 60-120  |
| 5 and above | 1 tablet             | 240     |

- **Do not** give the patient **Aspirin** or **Ibuprofen**
- Give large amounts of fluids (water, soups, milk and juices) along with the patient's normal diet
- The patient should rest
- Immediately consult your physician if any of the following manifestations appear: Red spots or points on the skin; bleeding from the nose or gums; frequent vomiting; vomiting with blood; black stools; sleepiness; constant crying; abdominal pain; excessive thirst (dry mouth); pale, cold or clammy skin; or difficulty in breathing.

## Characteristics

**Dengue fever** is a severe, flu-like illness that affects infants, young children and adults, but seldom causes death. The clinical features of dengue fever vary according to the age of the patient. Infants and young children may have a non-specific febrile illness with rash. Older children and adults may have either a mild febrile syndrome or the classical incapacitating disease with abrupt onset and high fever, severe headache, pain behind the eyes, muscle and joint pains, and rash.

**Dengue hemorrhagic fever** is a potentially deadly complication that is characterized by high fever, hemorrhagic phenomena, often with enlargement of the liver and in severe cases, circulatory failure. The

illness commonly begins with a sudden rise in temperature accompanied by facial flush and other non-specific constitutional symptoms of dengue fever. The fever usually continues for two to seven days and can be as high as 40-41°C, possibly with febrile convulsions and hemorrhagic phenomena.

**In moderate DHF cases**, all signs and symptoms abate after the fever subsides. **In severe cases**, the patient's condition may suddenly deteriorate after a few days of fever when the temperature drops, followed by signs of circulatory failure, and the patient may rapidly go into a critical state of shock and die within 12-24 hours, or quickly recover following appropriate volume replacement therapy.

## Immunization

At the present time, no vaccination is available against Dengue Fever or Dengue Hemorrhagic Fever.

## Prevent mosquito bites

- Dengue mosquitoes bite during the daytime - protect yourself from the bite
- Wear full-sleeve clothes and long dresses to cover the limbs.
- Use repellents—care should be taken in using repellents on very young children or the elderly
- Use mosquito coils and electric vapour mats during the daytime to prevent mosquito bites
- Use insecticide treated nets (ITNs) to protect young children, pregnant women, old people, in addition to others who may rest during the day.
- Curtains (cloth or bamboo) can also be treated with insecticide and hung at windows or doorways, to repel or kill mosquitoes.

## Prevent multiplication of mosquitoes (Vector Control)

Mosquitoes which spread Dengue live and breed in stagnant water in and around houses, and places where solid waste is dumped.

- Drain out the water from desert/window air coolers when not in use, in addition to tanks, barrels, drums, and buckets.
- Remove all objects containing water such as plant saucers from the house.
- All stored water containers should be kept covered at all times.
- Collect and destroy discarded containers in which water collects, such as bottles, plastic bags, tins, tyres, etc.
- Efficient disposal of all solid waste/garbage.

## Basic facts about Dengue and Dengue Hemorrhagic Fever

**How does dengue spread?** Dengue is spread through the bite of an infected *Aedes Aegypti* mosquito. The mosquito gets the virus by biting an infected person. The first symptoms of the disease occur about 5-7 days after the infected bite. There is no way to tell if a mosquito is carrying the Dengue virus. Therefore, people must protect themselves from all mosquito bites.

**Where does this mosquito live?** This mosquito rests indoors, in closets and other dark places. Outside, it rests where it is cool and shaded. The female mosquito lays her eggs in water containers in and around homes, schools and other areas in towns or villages. These eggs become adults in about 10 days.

**Where does the mosquito breed?** Dengue mosquitoes breed in stored, exposed, water collection systems. The favoured breeding places are: barrels, drums, jars, pots, buckets, flower vases, plant saucers, tanks, discarded bottles/tins, tyres, or water coolers, and other places where rainwater collects or is stored.

## Courtesy:

Ministry of health (Govt. of Pakistan)  
World Health Organization  
National Institute of Health

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