

Dengue Fever

Recently, there has been reports on the media that the dengue fever has killed a few people in Coimbatore, Salem and Namakkal districts in Tamil Nadu. In this respect, here we provide a few information about this epidemic for the information to the public.

Dengue is characterized by sudden onset, high fever, severe headache, joint and muscle pain and rash. Nausea and vomiting, loss of appetite, and altered taste sensation are common. A rash may appear 3 to 4 days after onset of fever and may spread from the torso to the arms, legs, and face. The disease is usually benign and self-limiting after about 7 days. Dengue may also present as a severe and fatal hemorrhagic disease, called dengue hemorrhagic fever (DHF). There is no specific treatment for dengue infection.

Dengue is a viral disease transmitted by urban Aedes mosquitos. The principal vector mosquito is Aedes aegypti, a species found living in close association with humans in most tropical urban areas. Mosquito biting activity is greatest in the morning for several hours after daybreak and in the late afternoon for several hours before dark. It may feed all day indoors, in shady areas, or when it is overcast. This mosquito breeds in artificial water containers, such as discarded tires, cans, barrels, buckets, 55 gallon drums, flower vases, and cisterns, all frequently found in the domestic environment.

There are four dengue virus serotypes (DEN-1, DEN-2, DEN-3, and DEN-4), and all are currently circulating in the Pacific Islands, Americas, Asia, and Africa.

Think You Have Dengue?

- Avoid analgesics with aspirin; use those with acetaminophen.
- Rest and drink plenty of fluids.
- Consult a physician.

General recommendations to avoid mosquito bites:

- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-m-toluamide). DEET in high concentrations (>30%) may cause side effects, particularly in children.

- Avoid formulations containing > 30% DEET. Use aerosols in an open space to avoid inhalation. Avoid applying repellent to the hands of children.
- Wear long-sleeved clothing and long pants if you are outdoors during the day and evening.
- Spray permethrin or DEET repellents on clothing, as mosquitos may bite through thin clothing.
- Use mosquito netting over the bed if your bedroom is not air conditioned or screened. For additional protection, treat the mosquito netting with the insecticide permethrin.
- Spray permethrin or a similar insecticide in your bedroom before going to bed.
- Vitamin B and ultrasound devices are NOT effective in preventing mosquito bites.

What is Dengue fever (DF)?

Dengue infection is caused by a virus. It occurs commonly as dengue fever. Occasionally the patient suffering from dengue may develop bleeding. Common sites for bleeding are nose, gums or skin. Sometimes, the patient may have coffee ground vomiting or black stools. This indicates bleeding in gastro intestinal tracts and it is serious. The patient with dengue who has bleeding has dengue haemorrhagic fever (DHF). Rarely the patient suffering from dengue may develop shock, then it is called dengue shock syndrome (DSS).

When should I suspect Dengue?

Dengue should be suspected when you have sudden onset of fever. The fever is high 103-105 degrees F or 39-40 degrees C. It is accompanied with severe headache (mostly in the forehead), pain behind the eyes, body aches and pains, rash on the skin and nausea or vomiting. The fever lasts for 5-7 days. In some patients, fever comes down on 3rd or 4th day but comes back. All the above symptoms and signs may not be present in the patient. The patient feels much discomfort after the illness.

There are several types of fever, when should dengue be suspected?

The characteristics of dengue that make it different from other causes of fever are the pain behind the eyes, severe pains in the muscles, severe joint pains, and skin rashes. These features make the diagnosis of suspected Dengue likely. The severe joint pains caused by DF is the reason why DF is also called break-bone fever.

What is the difference between suspected and probable case of dengue?

If a patient suspected to be having dengue has reduced platelets or an increase in blood haematocrit, then the patient has probable dengue. These additional findings makes dengue more likely. Patients with dengue may not have a high haematocrit if the person was anaemic to start with.

(Platelets are cells in blood that help to stop bleeding. Haematocrit indicates the thickness of blood).

Can you get dengue again after suffering from it once?

It is possible to get dengue more than once. Dengue can occur because of 4 different but related strains of dengue virus. If a person has suffered from one virus, there can be a repeat occurrence of dengue if a different strain is involved subsequently. Being affected by one strain offers no protection against the others. A person could suffer from dengue more than once in her/his lifetime.

Can the diagnosis of dengue be confirmed?

There are laboratory tests that provide direct or indirect evidence for dengue fever. These tests provide evidence for the occurrence of dengue infection. There are some additional tests that can help to identify the type of dengue infection. The tests for confirmation of Dengue should be done in reliable laboratories.

How can someone get dengue fever?

Dengue fever occurs following the bite of an infected mosquito *Aedes aegypti*. This type of mosquito has a peculiar white spotted body and legs and is easy to

recognize even by laymen. It breeds in clean water (see Question 20) and has a flight range of only 100 – 200 metres. The mosquito gets the Dengue virus after biting a human being infected with dengue virus.

Can I get dengue fever from another person?

Dengue does not spread directly from person to person. **It is only spread through the bite of an infected mosquito.**

When does dengue develop after getting the infection?

After the entry of the virus in the person, it multiplies in the lymph glands in the body. The symptoms develop when the virus has multiplied in sufficient numbers to cause the symptoms. This happens generally about 4-6 days (average) after getting infected with the virus.

Can people suffer from dengue and not appear ill?

Yes. There are many people who are infected with the virus and do not suffer from any signs or symptoms of the disease. **For every patient with symptoms and signs there may be 4-5 persons with no symptoms or with very mild symptoms.**

Can dengue fever be treated at home?

Most patients with dengue fever can be treated at home. **They should take rest, drink plenty of fluids that are available at home and eat nutritious diet. Whenever available, oral rehydration Salt/ORS (commonly used in treating diarrhoea) is preferable. Sufficient fluid intake is very important and becomes more important in case DF progresses into DHF or DSS where loss of body fluid / blood is the most salient feature.** It is important to look for danger signs and contact the doctor as soon as any one or more of these are found.

What is the treatment? Is it curable?

Like most viral diseases there is no specific cure for dengue fever. Antibiotics do not help. **Paracetamol is the drug of choice to bring down fever and joint pain. Other medicines such as Aspirin and Brufen should be avoided since they can increase the risk of bleeding.** Doctors should be very careful when prescribing medicines. **Any medicines that decrease platelets should be avoided.**

Can dengue fever become dangerous?

The infection can become dangerous since it may cause damage to the blood vessels. The damage may range from increased permeability of the blood vessels, causing leakage of blood fluid/plasma into various organs to completely broken blood vessels that causes bleeding. The symptoms and signs of dengue haemorrhagic fever and dengue shock syndrome are related to damage to the blood vessels and derangement in functioning in components of blood that help it to clot.

Can people die from dengue fever?

People who suffer from dengue fever have no risk of death but some of them develop Dengue Haemorrhagic Fever or Dengue Shock Syndrome. In some of these cases death can occur. With proper treatment, the patients with Dengue haemorrhagic fever and dengue shock syndrome can recover fully. Good treatment provided in time can save most lives.

When should a patient suffering from Dengue go to the hospital or consult a doctor?

Generally the progress towards dengue haemorrhagic fever or dengue shock syndrome occur after 3-5 days of fever. At this time, fever has often come down. This may mislead many of us to believe that the patient is heading towards recovery. In fact, this is the most dangerous period that requires high vigilance from care-givers. **The signs and symptoms that should be looked for are severe pain in the abdomen, persistent vomiting, bleeding from any site like, bleeding in the skin appearing as**

small red or purplish spots, nose bleed, bleeding from gums, passage of black stools like coal tar. Bring the patient to the hospital whenever the first two signs, namely, severe pain in the abdomen and persistent vomiting are detected. Usually it is too late if we wait until bleeding has occurred.

The most dangerous type of dengue is the dengue shock syndrome. It is recognized by signs like excessive thirst, pale and cold skin (due to very low blood pressure), restlessness and a feeling of weakness.

Is there a vaccine to prevent dengue fever?

A vaccine has been developed to prevent dengue fever but it is still under trial. It is not yet available in the market. Scientific progress is likely to help in prevention of dengue fever by vaccination in the years to come.

Are there any long term ill effects of dengue fever?

Most people who suffer from dengue fever recover in 1-2 weeks time. Some may feel tired for several weeks. However, if symptoms persist after this period, consult a doctor.

Where does the mosquito that spreads dengue live?

The highly domestic mosquito *Aedes aegypti* 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 the homes, and other dwellings. These eggs will develop, become larvae, and further develop into adults in about 10 days.

How can the multiplication of mosquitoes be reduced?

Dengue mosquitoes breed in stored, exposed water collections. Favoured places for breeding are barrels, drums, jars, pots, buckets, flower vases, plant saucers, tanks, discarded bottles, tins, tyres, water coolers etc.

To prevent the mosquitoes from multiplying, drain out the water from desert coolers/window air coolers (when not in use), tanks, barrels, drums, buckets etc. Remove all objects containing water (e.g. plant saucers etc.) from the house. Collect and destroy discarded containers in which water collects e.g. bottles, plastic bags, tins, used tyres etc.

In case it is not possible to drain out various water collections or to fully cover them, use TEMEPHOS, an insecticide, (brand name Abate) 1 part per million according to the local guidelines to prevent larvae from developing into adults.

How can I prevent mosquito bites to prevent dengue?

There is no way to tell if a mosquito is carrying the dengue virus. Therefore, people must protect themselves from all mosquito bites.

- Dengue mosquitoes bite during the day time throughout the day. Highest biting intensity is about 2 hours after sunrise and before sunset.
- Wear full sleeves clothes and long dresses to cover as much of your body as possible.
- Use repellents- be careful in using them in young children and old people.
- Use mosquito coils and electric vapour mats during the daytime also to prevent dengue.
- Use mosquito nets to protect children, old people and others who may rest during the day. The effectiveness of these nets can be improved by treating them with permethrin (pyrethroid insecticide). This bed-net is called Insecticide Treated Nets and are widely used in the prevention of malaria.

Is there any advice for the patient with dengue fever to prevent the spread of the disease to others.

The spread of dengue from a patient to others is possible. The patient should be protected from contact with the mosquito. This can be achieved by ensuring that the patient sleeps under a bed-net. Effective mosquito repellents are used where the patient is being provided care. This will prevent the mosquito from biting the patient and from getting infected and spreading it to others.

What is your advice on travel if there is an outbreak of dengue?

There is no travel restriction. However, you should be aware of what to do if you are travelling an area where dengue has been reported. This includes observing prevention measures described in these frequently asked questions and answers and reporting to the doctor if you have fever and are worried that it might be dengue fever.

What should the doctors treating dengue do ?

Patients suspected to be suffering from dengue haemorrhagic fever or dengue shock syndrome should be admitted to a hospital without delay.

The progress of these patients should be monitored regularly at 1-2 hours interval.

Platelet counts and haematocrits should be monitored repeatedly to review the progress of patients.

If the haematocrit levels fall dangerously then a blood transfusion should be considered. A fall of more than 20 % as compared to previous levels may be an indication for transfusion.

If the haematocrit values rise the patient should be given fluids intravenously and the fluids carefully monitored to ensure that the patient does not get excess fluids. A rise of more than 20 % as compared to previous levels may be an indication for IV fluids. The doctor should decide based on best judgement of patient's condition.

What should the doctors treating dengue avoid?

- Do not prescribe aspirin and brufen or any other medicine that reduces the platelets or increases the tendency to bleed.
- Avoid giving IV fluids unless the patient is bleeding or the haematocrit level is rising progressively.
- Avoid rushing into giving blood transfusion unless the haematocrit is falling dangerously.

- Do not give platelet transfusion unless the platelet count is very low or unless there is bleeding.

What is your advice regarding reporting of dengue?

All suspected or probable dengue cases should be reported to the health authorities. Further confirmation of the cases is done by the health authorities. Seek their guidance on blood collection and transportation of samples from suspected/probable cases of dengue.

What can the community do to prevent dengue?

In fact, the community is the key to dengue prevention. As elaborated above, prevention of dengue relies heavily on preventing the mosquito (*Aedes aegypti*) that transmits dengue from breeding inside and in the vicinity of homes. Every household can undertake the very simple measures to prevent existing water collections from becoming places for breeding of *A.aegypti* by draining out water from various containers, by regular changing of water plus cleaning flower vases and other items or, in the case of unused items, by discarding/destroying them.

Since the mosquito does not travel far, "house cleaning" by all members of a community will ensure that no breeding places exist, preventing dengue from occurring.

The main strategy in the prevention and control of dengue is "source reduction", or prevention of breeding places, mentioned above.

In the case of a dengue outbreak or epidemic what are our strategies?

Prevention of mosquito breeding places remains our mainstay. However to stop or to slow down the transmission it may be supplemented by "thermal fogging", using fogging machines. In fogging, we use an insecticide that has an immediate knock-down effect on adult mosquitos. When fogging is undertaken after an epidemic occurs, it is unfortunately too late. Fogging, to be effective, should be done at about 3-4 days interval. It is expensive and time consuming. Therefore, measures undertaken by the community, for the community, to prevent the

breeding of mosquitoes is far more cost-effective than containment measures once an outbreak occurs.

Clinical Aspects

Primary Infection:

- acute febrile illness of sudden onset
- fever lasting 3 to 5 days
- headache, myalgia, arthralgia or muscular pain, retro-orbital pain, anorexia
- fine maculopapular rash on extremities
- recovery may be associated with fatigue and depression
- children usually have milder disease than adults

Secondary Infection:

- Over 90% of cases of DHF and DSS occur in patients previously infected with the virus
- Symptoms are similar to those seen in primary infection, although after a period of 3 to 7 days the Patient goes on to display haemorrhagic symptoms.
- Bleeding, particularly in skin (petichiae), occasionally in gums and nose
- Increased vascular permeability, resulting in leakage of plasma into extravascular spaces and which leads to hypovolaemia.
- Haemorrhagic symptoms.
- Reduced blood pressure.
- Vascular changes and coagulopathy.
- Circulatory shock.
- Vomiting and abdominal pain.
- Lymphadenopathy and hepatomegaly may occur.
- Presence of blood in stools, vomitus, urine.

Diagnosis

Haemagglutination Inhibition Assays (HAI)

- Traditional method of diagnosis
- Sera must be acetone or kaolin treated before testing
- Requires paired sera collected at least 7 days apart
- Variance in potency of haemagglutinins made in different laboratories has lead to doubts regarding general applicability.

ELISA

- Pre-treatment of sera is not required.
- Sserial dilution not required - diagnosis can be made from a single serum specimen.
- Diagnosis can be from a single serum sample.

Treatment

No Specific treatment for primary dengue.

Secondary Infection:

- Intravenous fluid replacement and use of plasma expanders
- Oxygen therapy
- Blood transfusions in cases of severe bleeding
- Heparin for severe haemorrhage.

For more information visit the web site of World Health Organization, Regional Office for South East Asia at: <http://w3.whosea.org/EN/Index.htm>