

DENGUE AND ITS MANAGEMENT THROUGH AYURVEDA

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ABSTRACT

Dengue / Dengue Fever is an infectious tropical disease caused by Dengue virus and characterized by high fever, skin rash, headache, muscle and joint pain. It is a mosquito-borne infection that in recent decades has become a major international public health concern. Globally it is endemic in more than 100 countries. WHO recently estimates that there may be 50 million dengue infections worldwide every year. Dengue has been described as “*Dandaka Jwara*” in the *Parishista* Chapter of *Madhava Nidan*.¹ Here it has been described that a Mosquito is the basic cause for spread of this fever *Dandaka Jwara*. It usually subsides within a week but sometimes it is more fatal for children and old person. Till date there is no specific treatment available for dengue, but appropriate medical care can save the life.

Keywords: Dengue, Endemic, *Aedes aegypti*, Infection, Haemorrhagic, *DandakaJwara*, *Asthi Toda*, *Aruchi*, *Swarasa*, *Satwa*,

INTRODUCTION

The term “break-bone fever” was first named by Benjamin Rush in 1789 for dengue like illness. After that it was known as “dandy fever” and finally the term “Dengue” came into general use only after 1828. Dengue is a viral fever caused by viruses. This is spread or transmitted by the bite of mosquitoes called *Aedes aegypti* from one person to another. The viruses travel in the blood stream and that they destroy the body capacity to produce new platelets and the platelet count started falling after 2 to 3 days of the infection. It is emerging as a major health problem in tropical and sub-tropical countries like India and is drawing the attention of Government and all health agencies due to its fatality and limitations of treatment

in convention system.² As such there is no direct reference and description regarding dengue in Ayurveda. In the *Parishista* part of *Madhava Nidan*, there is the description about “*Dandaka Jwara*” which has much similar with dengue.¹

At present there is no specific treatment is available in modern Medicine. There is only focus on providing the symptomatic relief, complete rest and adequate fluid intake. According to WHO, dengue is the fastest growing mosquito borne disease across the world causing nearly 400 million infections every year. As per the National Vector Borne Disease Control Programme (NVBDCP) data of India, it has been reported that 1, 57,220 cases were infected and more

than 250 death were occurred due to dengue in the year 2017 and even the total number of deaths in this year was the highest in the last one decade. Most people with dengue recover without any ongoing problems. The mortality is 1 – 5% without treatment and less than 1% with adequate treatment.^{3,4}

History: The first record of case of probable dengue fever is in a Chinese medical encyclopedia (265-420 AD) which referred to a “water poison” associated with flying insects. There have been descriptions of epidemics in the 17th century, but the most plausible early reports of dengue epidemics are from 1779 and 1780, when an epidemic swept Asia, Africa and North America. From that time until 1940, epidemics were infrequent. In 1960, transmission by the *Aedes* mosquitoes was confirmed, and in 1907 dengue was the second disease (after yellow fever) that was shown to be caused by a virus. Further investigations by John Burton Cleland and Joseph Franklin Silver completed the basic understanding of dengue transmission.^{3,4}

Etymology: The origins of the word “dengue” are not clear, but one theory is that it is derived from the Swahili phrase *Ka-dinga-pepo*, which described the disease as being caused by an evil spirit. The Swahili word *dinga* may possibly have its origin in the Spanish word *dengue*, meaning fastidious or careful, which would describe the gait of person suffering the bone pain dengue fever. However, it is possible that the use of the Spanish word derived from the similar – sounding Swahili. Slaves in the West Indies having contracted dengue were said to have the posture and gait of a dandy and the disease was known as “dandy fever”. The term “break-bone fever” was first named by physician Benjamin Rush, in 1789. The term dengue fever came into general use only after 1828.^{3,4}

Transmission / Spreading: Dengue virus is primarily transmitted by *Aedes* mosquitoes, particularly *Aedes aegypti*. They bite primarily during the day. Other *Aedes* species that transmit the disease include *A. albopictus*, *A. polynesiensis* and *A. scutellaris*. Humans are the primary host of the virus, but it also circulates in nonhuman primates. An infection can be acquired via a single bite. A female mosquito that takes a blood meal from a person infected with dengue fever

becomes itself infected with the virus in the cells lining its gut. About 8 – 10 days later, the virus spreads to other tissues including the mosquito’s salivary glands and is subsequently released into its saliva. When the virus containing mosquito bites a normal human being, the virus is injected into the person’s body and he/she becomes infected and can develop symptoms of Dengue fever. Dengue can also be transmitted via infected blood products and through organ donation.^{3,4}

Mechanism of Dengue fever: When a mosquito carrying dengue virus bites a person, the virus enters the skin together with the mosquito’s saliva. It binds to and enters white blood cells and reproduces inside the cells while they move throughout the body. The white blood cells respond by producing several signaling proteins, such as interferon, which are responsible for many of the symptoms, such as the fever, the flu-like symptoms and the severe pains. In severe infection, the virus production inside the body is greatly increased and many more organs such as the liver and the bone marrow are affected. The fluid from the bloodstream leaks through the wall of small blood vessels into body cavities. As a result, less blood circulates in the blood vessels, and the blood pressure becomes so low that it cannot supply enough blood to vital organs. Furthermore, dysfunction of the bone marrow leads to reduced numbers of platelets, which are necessary for effective blood clotting; this increases the risk of bleeding, the other major complication of dengue fever.^{3,4}

Classification / Types: As per the World Health Organization’s 2009 classification, dengue fever is divided into two groups i.e. uncomplicated and severe. However, the older classification is still widely used.

There are three types of Dengue fever –

1. Classical (Simple) Dengue Fever
2. Dengue Haemorrhagic Fever (DHF)
3. Dengue Shock Syndrome (DSS)

The classical (simple) Dengue fever is a self-limiting disease and does not kill the patient. However, the other types (i.e. DHF & DSS) can prove fatal if prompt treatment is not started. It is important to

recognize whether Dengue Fever is Simple or DHF or DSS.^{3,4}

Laboratory tests:

Dengue fever may be diagnosed by haematological test like complete blood count (CBC) and microbiological laboratory testing. This can be done by virus isolation in cell cultures, nucleic and acid detection by polymerase chain reaction (PCR), and viral antigen detection or by antibody titer for dengue virus types through specific antibodies. Virus isolation and nucleic acid detection are more accurate than antigen detection, but these tests are not widely available due to their greater cost. All tests may be negative in the early stages of the disease. These laboratory tests are only of diagnostic value during the acute phase of the illness except for serology. Tests for dengue virus-specific antibodies, types IgG and IgM, can be useful in confirming a diagnosis in the later stages of the infection.^{3,4}

Diagnosis: The diagnosis of Dengue is typically made based on reported clinical symptoms and physical examination. However, early disease can be difficult to differentiate from other viral infections. A probable diagnosis is based on the findings of fever plus two of the following: nausea and vomiting, rash, generalized pains, low white blood cell count, positive tourniquet test, or any warning sign in someone who lives in an endemic area. Warning signs typically occur before the onset of severe dengue. The tourniquet test, which is particularly useful in settings where no laboratory investigations are readily available, involves the application of a blood pressure cuff for five minutes, followed by the counting of any petechial hemorrhages; a higher number makes a diagnosis of dengue more likely. It can be difficult to distinguish Dengue fever and Chikungunya, a similar viral infection that shares many symptoms and occurs in similar parts of the world to dengue. Often, investigations are performed to exclude other conditions that cause similar symptoms, such as malaria, typhoid fever and meningococcal infection. The earliest change detectable on laboratory investigations is a low white blood cell count, which may then be followed by low platelets and metabolic

acidosis. In severe disease, plasma leakage results in haemo-concentration (as indicated by a rising haematocrit) and hypo-albuminaemia. Pleural effusions or ascites can be detected by physical examination when in large quantity. But the demonstration of fluid on ultrasound may assist in the early identification of dengue shock syndrome.^{3,4}

Complication: Complications are more common in babies and young children, and in contrast to many other infections. Women are more at risk than men. Dengue can be life – threatening in people with chronic diseases such as diabetes and asthma. The main complications are:^{3,4}

- Febrile convulsions
- Severe dehydration
- Bleeding from nose and gums
- Blood in the stools or in vomiting
- Bleeding spots on the skin
- Very low blood pressure

Common Sign and Symptoms:

Dengue fever usually starts with sudden rise of high temperature, severe headache, nausea, vomiting, loss of appetite, swelling and severe pain in muscles, bones and joints. Red colour rashes develop on the body surface after 3 to 4 days of the fever in few cases. In some cases, bleedings started from mouth, nostril & hair follicles. This condition is known as hemorrhagic dengue. Patients feels severe breakdown in bones and joints as if someone has been beaten by stick. High temperature of 103⁰ to 105⁰F may occur which gets subsided within three to four days. Irregular pulse is found during fever. Symptoms like common cold, cough, throat infection and gastroenteritis are also found.⁵

Management: Dengue fever is a life-threatening disease/infection now a day. There is no specific treatment has been described in medical sciences for this fever except symptomatic relief. *Ayurveda* stresses to strengthen the immune system of the body and control of all the symptoms including body temperature. Keeping in the mind the treatment modalities of dengue can be categorized into symptom modifiers i.e. the agents that alleviate or lighten the symptoms & general health promoters i.e. the drugs

which improve the Quality of Life (QOL). Apart of these the vector control measures / agents are beneficial in the management of dengue.⁶

Symptom modifiers:

The agents that alleviate symptoms of dengue are categorized under symptom modifier like *Jwara hara* (anti-pyretic), *Sothahara* (anti-inflammatory), *Vedana hara* (analgesics) etc.

In initial stage, *Kwatha* prepared with *Dhamyaka*, *Parpatata*, *Kiratatikta*, and *Musta* may be advised. In case of hemorrhagic condition, *Vasa*, *Rakta Chandana* & *Yashtimadhu* along with sugar candy (*Mishri*) may be added in the *Kwatha* and advised to the patient. Other medicines like *Shamshamani Vati* (*Guduchi Ghana Vati*), *Sudarshanaghana Vati*, *Godanti Bhasma*, *Amrittottara Kwatha* etc. used as per the symptoms.⁸

General health promoters:

Many single herbs like *Guduchi* (*Tinospora Cordifolia*), *Tulasi* (Holy Basil), *Sunthi* (Dried Ginger) and juice of Papaya leave are the common herbs used to prevent its complications. Using of these herbs is potentiating the immune system of the body so the fever gets controlled within 4 to 8 days without any complications. *Amla* (rich in Vit - C) are used to help in absorption of iron.

Punarvana (*Borhavia Diffusa*) is helps in flushing out toxins from the body through micturition and perspiration. *Guduchi* (*Tinospora Cordifolia*) *Swarasa* and *Guduchi Satwa* are very much useful in dengue fever. *Tulsi* leaves boiled in water and that boiled water is used to improve the immune system and reduce the fever. *Anaar* (Pomegranate) juice and the juice of papaya leaves can be taken to increase the platelet count.⁸

Pathyaa-pathya:

Take light, nutritive, warm and easily digestible foods and proper rest and sleep and maintain personal as well as environmental hygiene. Avoid chilled foods & drinks, strenuous exertion and stressful conditions. Have cold milk with sugar candy. Consume 2-gram *Shunthi* (Dry Ginger) powder twice daily with infusion prepared by adding 5-gram (one teaspoonful) of *Guduchi* (*Giloye*) powder in 100 ml (1/2 glass) of

boiled water. Dose for children between 6 to 12 years of age will be half and for children below 6 years will be one fourth. One teaspoon of honey can be added to the infusion; and/or. One liter of water boiled with 10-15 *Tulsi* leaves and 10-15-gram *Dhania* (*Coriander*) powder for ten minutes and cooled to room temperature may be consumed at intervals of 3-4 hours in a day. Drinks like *Shadanga Paneeya*, *Dhanyakadi Hima* (*Dhaniya*, *Amla*, *Vasa*, *Draksha*, *Parpat*), Water of cardamom and clove and Green coconut water may be given in suitable quantity in 3 – 4 hours interval.^{3,8}

Prevention: Use Screens/nets on doors and windows. Wear full sleeved shirts, pants, shoes and socks to keep body covered. Use mosquito net on regular basis. Use mosquito repellents. Patient should be kept inside mosquito net. Do not keep open water and clean water logging area frequently.^{3,7}

DISCUSSION

Control of mosquito (vector) transmission, development of dengue vaccine and antiviral drugs constitute future directions with an aim to prevent and treat dengue infection. Control of mosquito (vector) transmission can be done by keeping guppies (*Poecilia reticulata*) or copepods (*doridicola agilis*) in standing water and infecting the mosquito population with bacteria of the *Wolbachia* genus. Due to the progressing transmission and enhancing severity of dengue infection, the necessity to develop a dengue vaccine has gained considerable importance. There is a worldwide public health need for a safe, effective and economic tetravalent dengue vaccine. Complex pathology, the prerequisite to control four virus serotypes and inadequate investment by vaccine designers have hindered vaccine advancement. Scrupulous attempts are aimed to develop antiviral drugs that can be used to manage dengue fever and avoid the life-threatening episodes.⁹

CONCLUSION

Dengue has evolved as a global life-threatening public health concern, affecting around 2.5 billion individuals in more than 100 countries. The physician should be aware about the varied clinical manifestations of this condition and ensure an early and adequate treatment plan. Future directions to combat this dreadful disease aim at methods of mosquito control, development of vaccine, and antiviral drug regimen.

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