

AYURVEDA: THE ALTERNATIVE TREATMENT FOR DENGUE**Aastha S. Yadav*, Aditi P. Prabhudesai and Dr. Milind J. Umekar**

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ABSTRACT

The present review article tells about Dengue infection, which is one of the mosquito-borne infections found in the tropics, with a geographical spread similar to malaria caused by one of four closely related virus serotypes of the genus *Flavivirus*, family *Flaviviridae*. In Ayurveda, Dengue fever is known as Dandakjwara which means joint pain that's why this is also called breakbone fever. The incidence of dengue has grown dramatically around the world in recent decades. Over 2.5 billion people – over 40% of the world's population – are now at risk from dengue. Data from the World Health Organization (WHO) estimates up to 100 million cases of dengue fever each year. This review highlights current understanding of dengue, including its

history, diagnostic tests, and its management through ayurvedic medicinal plant product. Plants such as guduchi, papaya leaf, *andrographis paniculata*, *Azidarachta indica*, *Amaltas*, *chirayata*, *datura*, *hara-dhania*, *hermal*, *kanghi* and *methi* are found to be beneficial.

KEYWORDS: Dengue, *Flaviviridae*, Ayurveda, dandakjwara.**INTRODUCTION^[1,2]**

Dengue is an acute viral infection with potential fatal complications. Dengue fever was first referred as “water poison”. The origin of word “dengue” is derived from the Swahili phrase “ka-dinga pepo” which describes “cramp-like seizure” caused by an evil spirit. The Swahili word “Dinga” had its origin from Spanish word “dengue”, which means fastidious or careful, which would describe the gait of a person suffering from the bone pain of dengue fever. The term dengue fever came into use only after 1828. Dengue is a viral infection transmitted by the bite of an infected female *Aedes* mosquito. Dengue viruses (DV) belong to family *Flaviviridae* and their four serotypes of virus referred to as DV-1, DV-2, DV-3, and DV-4. Dengue virus is a positive-stranded encapsulated RNA virus and is composed of three

structural protein genes, which encode the nucleocapsid core (C) protein, a membrane associated (M) protein, an enveloped (E) glycoprotein and seven non-structural (NS) proteins. Following the bite of an infected mosquito, the virus disseminates and infects multiple lymphoid and non-lymphoid tissues. The viral burden accumulates to the point that generalized clinical symptoms (fever, headache, and myalgia) develop, presumably secondary to a host antiviral state in which interferon expression is abundant. Host and virus variables shape the clinical outcome of any given dengue virus (DENV) infection. For the host there is undoubtedly physiological component that influences whether infection or (re-infection) has a benign outcome or results in disease that manifests across a gradient of severity.



Fig. 1:-Female Aedes mosquito bite.

Epidemiology

Dengue is widespread throughout the tropics, with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, quality of vector control services in urban areas as well as degree of urbanization. The incidence of dengue is increased 30 fold between 1960 and 2020. This increase is believed to be due to multiple factors like, rapid urbanization, population growth; increase is believed international travel from endemic areas and lastly global warming in India. First outbreak was reported during 1963 in Kolkata, The next major outbreak of Dengue/Dengue Hemorrhagic Fever was reported in Delhi and neighboring states in 1996.

Statistics of Dengue In India

India in 2017 has seen 11,832 more cases of dengue compared with 2016 and the number of deaths from the vector-borne disease has been recorded more than last year. According to the

directorate of national vector borne disease control program (NVBDCP), till July 30, 2016 the total dengue cases in the country were 16,870 while for the same period 2017 that saw 2,536 cases with 10 deaths. Kerala reported the maximum dengue cases with 15,913 cases followed by Tamil Nadu with 5,474 cases, Karnataka with 4,186 cases, and Andhra Pradesh with 798 cases, west Bengal with 571 cases and Maharashtra with 460 cases.

Symptoms

A primary symptom of dengue appears in 3 to 15 days after mosquito bite and it includes high fever and severe headache, with severe pain behind the eyes. Dengue hemorrhagic fever is a more serious form of dengue infection. Other associated symptoms includes-

- Significant dehydration
- Abdominal pain
- Fever
- Fatigue
- Loss of appetite
- Nausea
- Vomiting
- Tachycardia increased capillary refill time
- Cool mottled or pale skin
- Diminished peripheral pulses Change in mental status.
- Oliguria
- Sudden rise in haematocrit despite administration of fluids
- Narrowing of pulse pressure (20mmHg)
- Hypotension (A late finding representing uncorrected shock)
- Retro orbital pain behind the eye. Rashes develop on the feet or legs 3 to 4 days after the beginning of the fever
- Swelling and pain in muscles and joints
- The joint pain in the body has given dengue fever the name that is “break bone fever”.

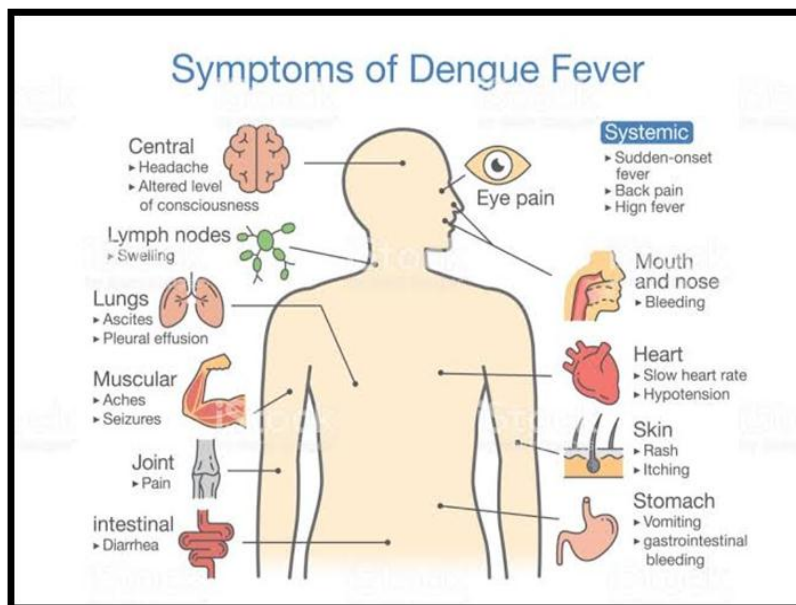


Fig. 2: Symptoms of dengue fever.

Diagnosis^[3]

Confirmed diagnosis of dengue infection requires laboratory tests. Laboratory diagnosis methods for confirming dengue virus infection may involve detection of the virus, viral nucleic acid, antigens or antibodies, or a combination of these techniques. After the onset of illness the virus can be detected in serum, circulating blood cells, plasma and other tissues. Some of the following ranges of diagnostic methods are as follows-

1. Platelet count

Any fever not settling down after three or four days should invite further tests like blood count, routine urine test, chest x-ray. Dengue fever is usually characterized by lowering of platelets in the blood. The platelet count may need to be repeated everyday if they show lowering trend. If these keep going down it is best to hospitalize the patient for further treatment.

2. Hematocrit Test

Hemorrhagic dengue fever leads to leakage from blood vessels and this can lead to increased vascular permeability. This is manifested by one or more of the following – a hematocrit level increase greater than 20% is a sign of hemoconcentration and precedes shock. The hematocrit level should be monitored atleast in every 24 hours to facilitate early recognition of dengue hemorrhagic fever and every 3-4 hours in severe cases of dengue hemorrhagic fever or dengue shock syndrome.

3. Detecting specific antibodies

Serologic diagnosis requires collection of serum within 6 days after onset of Symptoms; the serum is tested for detecting specific anti-dengue antibodies by enzyme linked immunosorbent assay (ELISA). Increase of four fold concentration of IgG (immunoglobulin G) or IgM (immunoglobulin M) antibody titers to one or more of the dengue virus antigens in serum sample is diagnostic of dengue.

4. Isolation of the virus

Isolation of virus requires collection of serum sample from patients within 5 days after appearance of symptoms. To do the isolation of virus 'Polymerase Chain Reaction (PCR)' is done. This detects the viral genomic sequence from Serum samples.

Prevention and Control

Control and prevention depends protection from the bites of aedes mosquito which is supposed to transmit in infection. The method of controlling the mosquito is by eliminating its habitats. Elimination can only be done by getting rid of open sources of water, or by adding some insecticides or biological control agents to such areas. People can also prevent mosquito biting by wearing clothing that fully covers the skin. Prevention can also be done by using mosquito repellents as well as by using mosquito netting while resting.

Ayurvedic Treatment

Several ayurvedic medicines are useful for dengue treatment. Medicines are made of natural substances, and are found to be completely safe with no side effects and have shown effective results in thousands of dengue cases.

A. Guduchi^[4]

Giloy or Amrita is an anti-inflammatory (that reduce inflammation) and antipyretic (that reduce fever) herb. It is also known as Guduchi, Madhuparni, Amrita, Chinnaruha, Vatsadaani, Tantrika, Kundalini and Chakralakshanika. Giloy is found abundantly in North India. This herb, which has been used in Ayurvedic Rasayanas since centuries, is very helpful in building up the immune system and the body's defense against infecting organisms. In a scientific study conducted using human WBC (white blood corpuscles), the Ayurvedic herb helps in enhancing the killing ability of macrophages (the resistant cells which are responsible for fighting foreign bodies as well as microorganisms).



Fig. 3: Guduchi.

There are many uses of Giloy or Amrita which have botanical name *Tinospora cordifolia* and family-Menispermaceae. It mainly contains-Columbin, tinosporaside, jatrorrhizine, palmatine, berberine, tembeterine, tinocordifolioside, phenylpropene disaccharides, choline, tinosporic acid, tinosporal, and tinosporon have been isolated from *Tinosporacordifolia*. 3-6 gram Stem part of guduchi is mostly used by decoction method in 50-100 ml water. Leaves and roots are also used for medicinal purpose. There is a special extracted preparation of Guduchi, called as Guduchisatva which is useful in fever.

Action of Guduchi^[5]

The bitter properties present in the drugs have antispasmodic properties which is helpful in preventing infectious diseases like dengue, swine flu, malaria etc. This wonderful Ayurvedic herb helps in raising the efficiency of protective WBC (white blood cells) and builds up the body's own protection mechanism known as immune system, anti-inflammatory, antirheumatic, and anti-allergic actions. In dengue, platelets count is decreases and body strength is very weak. Guduchi increase platelet counts. Guduchi play an amazing role in strengthening our natural immune system by helping the White Blood Cell count to increase in our body. This action of Guduchi as major immunity booster is very remedial especially during the dengue spell. In dengue, immune power is very weak. Guduchi boost immunity in dengue fever. *Tinospora* is effective in promoting regeneration of the liver. Dengue is sometimes associated with the problems of degeneration of liver. This herb fights this degeneration by raising the efficacy of the WBCs in the body.

B. Papaya^[6,7,8]

In recent times, papaya leaves are very effective and useful in management of dengue fever especially in increasing platelet count in dengue patients with low platelet count, and those who develop hemorrhagic dengue fever. Drinking papaya leaf juice is found to be one of the effective remedy. The leaves have essential nutrients and organic compounds which help in increase platelet count. Papaya leaves are also rich in vitamin-C which stimulates immune system, whereas antioxidants present in leaves helps in reducing the stress and remove toxins from the body.



Fig. 4: Papaya leaves.

C. Basil leaves

Basil leaves are miraculous herbs that not only help during dengue fever, but also improve overall immunity. Chewing 5-6 basil leaves boosts immunity and has been recommended as an effective Ayurvedic treatment for dengue fever. Basil leaves contains essential oils with natural insecticidal properties which keep mosquitoes at bay.



Fig. 5: Basil leaves.

D. *Azidarachta indica*^[9]

Neem leaves has medical properties, and this is the reason they are recommended for a variety of ailments. Steep neem leaf and drink the brew to increase platelet and white blood cell count. Properly brewed leaves also found to increase immune system in dengue.



Fig. 6: Neem leaves.

E. Orange juice

Oranges are rich in antioxidants and vitamins which help in treating the secondary symptoms of dengue. Orange juice also helps in eliminating dengue virus by promoting antibodies in the immune system, by increasing urination and thereby ultimately releasing toxins from the body. Orange juice also repairs body cells as it contains vitamin-C which is crucial in creating collagen.



Fig. 7: Orange juice.

F. Datura

Datura leaves are effective in reducing the fever in dengue infection. It helps to reduce the seriousness of fever in dengue infection.



Fig. 8: Datura leaves.

G. Amaltas

Amaltas is the root of the cassia tree. It is used as a tonic for reducing fever in dengue.



Fig. 9: Amaltas.

H. Coriander leaves

Hara dhaniania is also taken as a tonic that reduces fever in dengue.



Fig. 10: Coriander leaves.

I. Chirayata

Chirayata is useful for treating convulsions that occurs in dengue. It is also found to be effective for treating fever as well.

J. Fenugreek leaves

Fenugreek leaves are known to reduce fever and act as a sedative to ease pain and promotes restful sleep for patients. The leaves can be soaked in water and can be used to drink. Methi powder is also found to be beneficial. It is also known to stabilizing the high fever that is a common dengue symptom.



Fig. 11: Fenugreek leaves.

Homeopathic Medicines

A. For Dengue Fever With Weakness and Prostration

Gelsemium

Gelsemium is the best Homeopathic remedy for Dengue Fever patients who experience outmost weakness and prostration. A state of dullness, dizziness and drowsiness is the perfect

description to select Gelsemium over other Homeopathic medicines for the treatment of Dengue Fever. The patients seem lethargic and have a desire to lie down in perfect silence without any disturbance. He or she also wants to be quiet and dislikes conversation. The patient experiences chill, but in selecting Homeopathic medicine Gelsemium, the chill is most typically marked in the back and travels up and down the back. Another feature is heaviness of eyes. The headache is mainly present in back portion that in most cases travels up to the forehead and eyes. There is also an absence of thirst in majority of cases.

B. For Dengue Fever When Joint Pains and Bodyaches Are Present

Eupatorium Perfoliatum

Eupatorium perfoliatum is the best natural Homeopathic cure for body ache in Dengue Fever. Homeopathic remedies Bryonia Alba and Rhus Tox too are of great help in providing relief from joint pains or general body ache in Dengue Fever. Which of the two best suits the patient depends on the specific individual features. The most specific feature to choose Bryonia Alba is worsening of pains by any movement even in the least degree. This Homeopathic medicine is the best remedy when rest is the main position for relief from pain. Extreme thirst with a dry mouth may be felt along with this specific feature. Thus it is the ideal Homeopathic medicine when a patient experiences relief from pain by movement and worsening of pain by taking rest.

C. For Dengue Fever When Severe Headache Accompanies It

The most significant natural Homeopathic medicines for headache in Dengue Fever are Gelsemium, Belladonna and Eupatorium Perfoliatum. Gelsemium is the best Homeopathic remedy when a Dengue Fever patient experiences pain in back of the head (Occiput). The pain can also travel from back of the head to the forehead or eyes. Heaviness of eyes is also marked with pain in head. Homeopathic medicine Belladonna is the best choice when pain is marked in the sides of head (temples). For using Belladonna, the pain is very violent and throbbing in nature. Tight binding of head provides relief. Natural Homeopathic medicine Eupatorium Perfoliatum is recommended for with vertex headache.

D. Dengue Fever When Nausea and Vomiting Is Present

Along with Eupatorium for relieving nausea and vomiting in Dengue Fever, Homeopathic remedies Ipecac and Arsenic Album can be used. Ipecac is a Homeopathic medicine of great help when there is persistent nausea and vomiting. Arsenic Album is the ideal Homeopathic

medicine when nausea gets worse by the smell or sight of food and vomiting gets worse from eating or drinking anything.

E. For Dengue Hemorrhagic Fever

Although Homeopathic medicines are beneficial in treating Dengue Hemorrhagic Fever, urgent medical advice is advised as such cases can be life-threatening and may need urgent hospitalization. The main Homeopathic medicines that can help in Dengue Hemorrhagic Fever are China, Ipecac and Arsenic Album. Homeopathic medicine China is of great help when there is bleeding from any mucus membrane along with marked exhaustion. Debility and outmost prostration with hemorrhages is its main indication. When the hemorrhages are accompanied by severe nausea and vomiting, then Ipecac is the most suitable Homeopathic medicine. Arsenic Album is the best Homeopathic medicine when outmost anxiety and restlessness accompany bleeding. The person needing Arsenic Album may also have a fear of death along with anxiety. The thirst for water at very small intervals may also be felt by persons who can greatly benefit from Homeopathic remedy Arsenic Album.

CONCLUSION

Dengue fever represents a real economic burden especially in affected countries. Extensive efforts are needed to tackle disease spread and reduce the mortality rates and the associated healthcare cost. This will be a step forward to develop an adequate preventive Ayurvedic medicines and effective treatment using various medicinal plants Guduchi (giloyor, amrita), *Andrographis paniculata*, *Azadirachta indica* (neem) along with other medicinal herb as they exhibit potential activity against dengue fever. Patient with dengue fever showing significant increase in platelet count after administration of papaya leave. Guduchi plays an amazing role in strengthening our natural immune system. The aqueous extract of neem leaves (NL) completely inhibited 100–10,000 infective tissue cultures. As many plants from all over India were found in literature search which were recommended for their use against dengue. However, many plants/extracts have been tested scientifically and also have shown evidences of efficacy. There is a need to search more such herbal formulations which are being practiced at local level, document them properly and validate them scientifically to confirm efficacy, understand mechanistic action and safety so that they can be exploited for their anti-dengue potential, as the allopathic treatment does not show higher efficacy.

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