

## Dengue: A monsoon threat

R Arivuchudar

Assistant Professor, Department of Clinical Nutrition and Dietetics, Periyar University, Salem, Tamil Nadu, India

### Abstract

Dengue, the most threatening disease spread by the *Aedes aegypti* mosquitoes, hosting dengue virus, peaks during the months of September and October. The bite of such mosquitoes initiates with the symptoms of flu and slowly progresses to a possibly deadly disease, dengue. In recent times during monsoon the occurrence of dengue has reached its heights in urban and semi-urban areas across the world. The treatment for dengue is not specific but the experts are of view that the fatalness can be reduced by early detection and appropriate therapeutic measures on time. The widespread education, about the causes, proper control measures to be taken and the role of diet will help prevent the spread of dengue to a great extent. The vaccination for dengue with the vaccine, Dengvaxia has been done by the National Regulatory Authorities in the endemic areas for the vulnerable age group of 9-45 years. (WHO, April, 2017). This article is prepared with the motive of creating awareness and saving lives from dengue as we are just ahead of the favorable season.

**Keywords:** dengue, prevention, diet

### Introduction

The dengue virus prime carrier, the *Aedes aegypti* female mosquito's early morning bites and the evening bites before sunset transmits the virus to the humans, resulting in dengue after an incubation period of 4-10 days. In turn the dengue affected humans become carriers of the virus, being a source for the uninfected mosquitoes, thus making dengue an epidemic. The breeding place of dengue vectors are predominantly thrown away tires left undisturbed for a long period of time, lucky bamboo, water holders like flower vases, refrigerator tubs, stored soft water in houses, in stagnant water and peridomestic areas. This virus are even tolerant to extremes of cold temperatures and hence poses a threat during monsoon.

### Prevalance in India - 2017

The Health Ministry of India has reported that till 2nd July 2017 around 18700 cases of dengue has been identified, of which Kerala peaks with 9104 dengue cases followed by 4174 cases in Tamil Nadu, 1,945 cases in Karnataka, 616 cases in Gujarat, 606 cases in Andhra Pradesh 469 in west Bengal and around 100 cases in Delhi. The early onset of monsoon is considered as one of the factors for dengue spurt ahead of the usual season and the troll is expected to increase in forthcoming months.

### Symptoms

Dengue fever is a dreadful illness, where the virus mostly invades the infants, young children and adults. A High Fever around a temperature of 103-104°F lasting for about 2 to 7 days in combination with the following symptoms symbolises initial phase of dengue:

- Severe headache,
- Pain behind the eyes, muscle and joints,
- Intolerable pain in bones – break bone fever
- Nausea,

- Vomiting,
- Swollen glands or
- Skin rash.

The physiological complications of dengue includes

- Low platelet count (less than 20,000), where the normal value is 1.5- 4 lakhs,
- Oozing of plasma,
- Oedema- Accumulation of fluid,
- Difficulty in breathing,
- Severe bleeding, or
- Loss of organ functioning.

If left untreated, the alarming signs arise 3–7 days after the first symptoms along with a decrease in temperature to less than 100°F and increased breath rate, restlessness, abdominal pain, continuous vomiting, bleeding of gums, tiredness and hematemesis. These factors serves as an indicator of the critical phase which is disastrous. Hence proper diagnosis at the initial phase and appropriate medical care can prevent death.

### Dietary Interventions in Dengue

The prime area of dietary concern for dengue must be on enhancing the synthesis of white blood cells, the disease-fighter of our body. A potent dose of phytonutrients that lifts the immune system's production of infection-fighting natural killer cells and T-cells must be emphasised. Nutrients which escalate the production of antibodies should be prioritised.

The good quality protein with the power of all essential amino acids is indispensable not only for the production of antibodies but also to improve levels of glutathione, an antioxidant that backs the immune system.

Apart from providing an ample quantity of foods to develop the immunity it is equally important to replenish the body with fluids. Fluids should be given at regular intervals to compensate the loss through sweat and to

permit sufficient urinary output for excreting toxins and wastes. Children must be encouraged to drink around 2.5 to 3 litres of fluids per day while the infant's intake should be 0.7-0.8 litres of fluids per day.

During fever due to poor appetite it is of utmost importance to prescribe foods to satisfy patient's likes. To start with, in the initial 2-3 days of dengue it is always suggested to opt for liquid foods to compensate for the fluid loss as dehydration is the main complication. Liquid foods also help to improve the appetite.

In due course, soft solid foods can be gradually introduced. Since the liver function is impaired it is highly essential to provide easily digestible foods as well as the food selected should be in a form which supplies high energy in lesser quantities. As the patients food intake significantly improves formulation of high protein diet can be stressed.

Highly seasoned spicy, oily, fried, salty foods should be avoided. Stay away from refined sugars, processed foods, and carbonated beverages. These foods cause indigestion and also the trans-fat present in these junk foods contain free radicals which are responsible for tissue damage and lowering of platelet count.

Raw foods should not be consumed as they may be a source of parasite infection in the colon, which leads to a decrease in the platelet count.

A diet high in calories, protein, and vitamin (especially vitamin C and K), mineral (especially calcium and iron), low in fat with plenty of fluids is emphasised after the fever to refurbish platelet count and all the nutrients in the body.

The following list of foods packed with these potentials, can be recommended to lift the pace of life with dengue. Liberty can be given to modify the form (boiled, mashed, juices, soups etc.) of consumption to suit patients need and palatability.

#### **Papaya leaf extract**

The papaya leaves should be washed well and grinded with water. Oral consumption of 25 ml of this extract twice daily for five days cures dengue. The active antioxidant factors like papain, chymopapain, L-tocopherol, flavonoids, ascorbic acid and glucosides improve the immune modulatory effects thereby increasing the platelet counts.

#### **Oral Rehydration Solution**

Six teaspoons of sugar and half a teaspoon of salt dissolved in a liter of boiled and cooled water taken at regular intervals does wonders in hydrating the body.

#### **Fruit juices**

It is recommended to intake fruit juices instead of whole fruit as it helps in adding fluids to the body facilitating the excretion of toxins through urine. The fruits juices of amla / gooseberry, orange, lime, sweet lime, litchi, pomegranate, pineapple, kiwi, strawberry, guava, watermelon, tomatoes, grapes are commendable sources of vitamin C, an antioxidant that prompts the synthesis of collagen, lymphocytes thereby triggering the immune system to fight against the virus.

#### **Coconut Water**

Coconut water should be framed as an important component of diet while convalescing from dengue as it is a rich source of electrolytes-sodium, potassium, phosphorus and magnesium which are crucial for maintaining the electrolyte balance and minerals like zinc and selenium which act as antioxidants.

#### **Vegetables**

Carrots and green leafy vegetables contain beta-carotene and vitamin B6, powerful phytonutrients which boosts the production of antibodies. The presence of Calcium and vitamin K, the two main components of blood clotting together makes Green leafy vegetables an important resource to improve platelet count. Inclusion of garlic helps white blood cells proliferate faster because of the presence of sulphur-containing compounds- allicin and sulphides. Mushrooms too aid in the production of white blood cells and act more effectively against foreign bodies. Cucumber, beets and red cabbage can be included to improve the doses of vitamin C. These vegetables are loaded with essential vitamins and minerals that improve immunity and lessen the grief of the patients.

#### **Nuts and Seeds**

Almond is treasure of nutrient Vitamin E, which fuels the production of natural killer cells, aiding in boosting immunity. Four to five soaked almonds will do wonders in speedy recovery.

Wheat germ, flax seed and Sunflower seeds are power houses of Vitamin E which can be added to any food consumed to improve resistance.

#### **Porridge**

Porridge prepared from any cereal (rice, broken wheat, oats) ensures to provide adequate nutrients to combat the disease. It is easy to swallow and digest.

#### **Herbs and Spices**

Herbal Tea or Decoctions prepared from Neem leaves, Tulsi, Ashwagandha, Aloe Vera, Turmeric and Ginger act as an effective ayurvedic remedy to treat dengue fever by increasing the white blood cell count and the platelet count.

Green tea bundled with flavonoids has anti-inflammatory and antioxidant characteristics that wards off harmful microbes, toxins and helps in replenishing the immune system.

#### **Protein Foods**

Foods such as legumes, milk, egg white, chicken, and fish, high in protein and low in fat are highly advised for dengue patients to fight the virus. Protein rich foods helps to replenish lost nutrients. Albumin in egg white and Calcium in milk helps to boost the platelet count.

To sum up, rest with intake of plenty of fluids orally is indispensable for combating against dengue fever.

#### **Conclusion**

The main strategy to battle against dengue is to overcome the spread of dengue virus through the mosquitoes by implementing the following measures.

- Prevent water stagnation to avoid breeding of mosquitoes,
- Proper disposal of unwanted logs, tiers,
- Frequent emptying and changing of water stored for domestic purpose,
- Use of mosquito nets for windows, on beds etc.
- Use of mosquito repellants with proper cautions,
- Sprinkle salt on long standing waters,
- Use of dark colored full sleeved dress materials.

To conclude, spreading these measures of prevention of dengue and improvising the food choices by means of Medias, Newspapers and Health workers and educating the young minds in schools can go a long way in overcoming this lethal seasonal illness.

### References

1. <https://www.ncbi.nlm.nih.gov/pubmed/27525287>
2. [www.who.int/mediacentre/factsheets/fs117/en/](http://www.who.int/mediacentre/factsheets/fs117/en/)
3. [www.livemint.com](http://www.livemint.com) › Science › Health
4. <https://nhp.gov.in/disease/musculo-skeletal-bone-joints-/dengue-fever>
5. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL *et al.* The global distribution and burden of dengue. *Nature*. 496, 504-507.
6. Brady OJ, Gething PW, Bhatt S, Messina JP, Brownstein JS, Hoen AG *et al.* Refining the global spatial limits of dengue virus transmission by evidence-based consensus. *PLoS Negl Trop Dis*. 2012; 6:1760. doi:10.1371/journal.pntd.0001760.