



A REVIEW ON DENGUE AND ITS MANAGEMENT

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ABSTRACT

Dengue fever is most prevalent viral and acute febrile diseases. It is caused by virus mainly found in tropics with geographical spread shortly after rainy seasons. Transmitted in humans by mosquito. It known as break bone fever due to sometime severe joint & muscular pain found. Death usually due to ignorance of method of treatment. It is very low mortality. It can cause wide spectrum of illness mild to severe fatal dengue hemorrhagic fever. In Ayurvedic literature diseases caused by low immunity in body. In this ancient science of healing, The concept of immunity based on beej-bhoomi theory. It can correlated with Aagantujvishamjwara mentioned in ayurvedic literature. It is prevented by enhancing body immunity & follow specific dincharya, ritucharya. Prevention of dengue fever by using bed nets, insecticide. Be aware of peak exposure time & place. Dengue fever is usually self limited illness. In Ayurveda many medicinal plant like Papaya, tulsi, neem, kalmegha, aargwdha, dhatura are useful to treat dengue.

KEYWORDS: Dengue, Medicinal plant, Aagantujajwara.

INTRODUCTION

Ayurveda is a practical, medical science which promotes perfect health through prevention and cure the health problems by recommending life style changes. Dengue is the most emerging viral ailment in human beings caused by arthropode-borne flavivirus named dengue virus (DENV) transmitted by the infected bite of Aedes aegypti mosquito.

Dengue is characterized by high grade biphasic fever (about 104-105 F), skin rashes and pain (headaches and often severe muscle & joint pains), thus termed as "Break-bone fever, "dandy fever". Four different antigenic varieties of dengue virus are recognized and all are transmitted by the day time biting Aedes aegypti which breed in standing water in refuse dumpsite. It has become major international public health concern. Dengue is correlate with aagantuja vishmjwara basis on symptom & pathogenesis. In ayurvedic literature have many herbal medicine were described for management of dengue.

AYURVEDIC VIEW

^[1]Acc. To Acharya Charaka diseases caused only when there is lack of immunity(compromised immune system) in the body. Concept of immunity is based on beej-bhoomi theory i.e. ojas is the product of healthy digestive system which helps the body in resisting infection.

^[2]In Sushrut Samhita – Dengue can be correlate with Aagntuja vishamjwara because of irregular onset, action, time and reappearance.

^[3]According to Acharya Dalahna –Intermittent fever as caused by invasion of evil spirits/ microorganism/ Bhoot.

^[4]Rakta Dhatwashrayjvara – Hemoptysis, burning sensation, perspiration, vomiting, giddiness, boil all symptom of fever located in blood.

Virus infestation throws pitta out of balance leading to destruction of platelets.

^[5]Aacharya Charaka has mentioned – Vishamjwara, vatolvana sannipatajjwara^[6]

^[7]Aacharya Chakrapani has mentioned – Bhootanubandha

^[8]Madhavkara has recognized – Bhootabhishyangajwara and dandakjwara.

^[9]Aacharya Charaka have described about Janpdodhwansa is dedicated to diseases causing epidemics

^[10]Aacharya Bhava Prakash explained Vatolvana sannipatjjwara.

EPIDEMIOLOGY

^[11]Dengue ranks as the most important, rapidly emerged mosquito-borne viral diseases in recent years and is endemic in all continents. Over the past 5 decades, there has been a dramatic global increase in frequency of

dengue fever, DHF, DSS and their epidemics with a concomitant increase in diseases incidence. It now endemic over 100 countries like India, South East Asia, Western pacific, Africa, America, Malaysia.

^[12]Recent survey reveals that there are 50 million dengue cases was reported and approximately 2 billion people lives in dengue endemic countries.

Table no: 1 In India – following graph shows dengue cases and deaths since 2010.^[13]

YEAR	CASES	DEATH
2010	28292	110
2011	18860	169
2012	50222	242
2013	75808	193
2014	40571	137
2015	99913	220
2016	45490	88

PATHOGENS OF DENGUE

Dengue virus is single stranded RNA virus belongs Flaviviride family. There are 4 different serotypes according to biological and immunological criteria.^[14]

- DEN-1
- DEN-2
- DEN-3
- DEN-4

At present 3,6,4, and 4, genotypes have been identified for four dengue virus serotypes. multiple genotype s often co-circulate within the same geographic area. DEN 2 & 3 serotypes with Asian origins have been established as

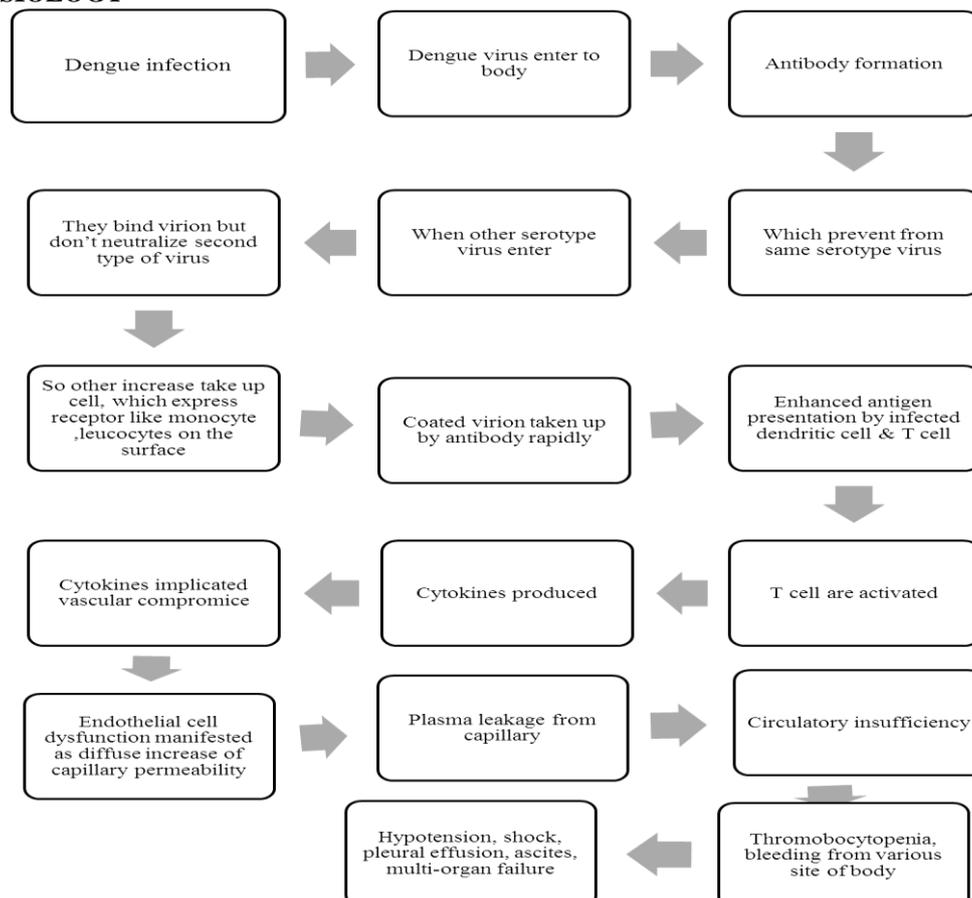
endemic cycles in other continents. Dengue virus composed 3 structural protein.

- Enveloped protein – found in viral surface.
- Membrane protein – imp for formation of viral particles.
- Nonstructural protein – it is involved in replication of viral RNA.

VECTOR MOSQUITO

- *Aedes aegypti*
- *Aede salbopictus*

PATHOPHYSIOLOGY

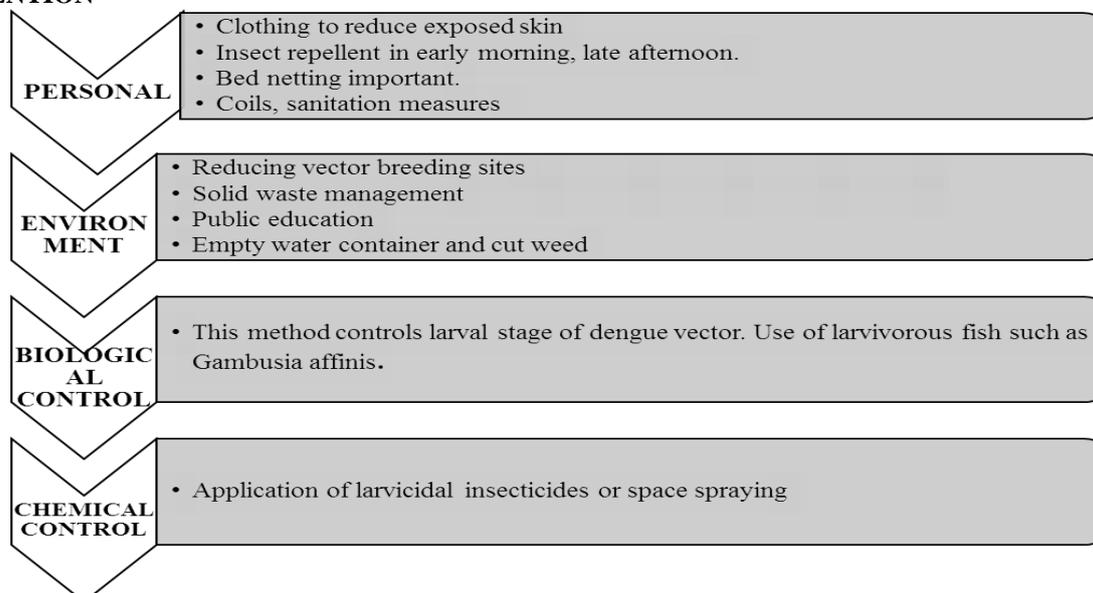


CLINICAL MANIFESTATION

S.NO.	CLASSIC DENGUE FEVER ^[15]	DENGUE HEMORRHAGIC FEVER	DENGUE SHOCK SYNDROME
1.	It occur in non-immune and non- indigenous adults & children.	It follows secondary dengue infection.	This condition is associated with very high mortality
2.	Headache with throbbing pain behind the eyes	High fever, intermittent, associated with rigor, bleeding from nose or any site of body.	Typically circulatory failure such as tachycardia, hypotension, cold blotchy skin, congested peripheries.
3.	Fatigue, muscle & joint pain	The fever last for 2-7 days then fall sub normal level when patient either recover or progresses to plasma leakage phase.	Patients with DSS die due to multi-organ failure and disseminated intravascular coagulation.
4.	Unpleasant metallic taste in mouth	Onset of plasma leakage is characterized by tachycardia, hypotension, sweats, cold extremities.	
5.	Nausea, vomiting, abdominal pain	In severe case plasma leakage ,patient may develop circulatory shock(prolonged capillary refill time, narrow pulse pressure)	
6.	Dermatological manifestation such as flushed skin(on face & neck),a maculo-papular rash on arm and leg.	During plasma leakage –pleural effusion, pericardial effusions, myocarditis.	
7.	Minor bleeding, Patechiae, GI bleeding	Thrombocytopenia, Heamoconcentration are usually detectable before the subsidence of fever and the onset of shock.	

EXAMINATION AND INVESTIGATION

- Estimation of Electrolyte level.
- Full blood count –Assess Platelet level
- antigen test. Serological studies –
 - ELISA- based on NS1
 - IgM –capture enzyme– linked immune-sorbent assay (mac-elisa).
- Serum studies from samples taken during acute illness and convalescence(increase in titre to dengue antigen).
- Tourniquet test- causes petechiae to form below the tourniquet.
- X-ray of chest- may demonstrate pleural effusion.
- Isolation of dengue virus.
- Polymerase chain reaction.

PREVENTION

MANAGEMENT

Dengue is single stranded RNA virus. There are no approved antiviral agents or vaccine is available for treatment of this virus which increases mortality rate all

over world. As there are no synthetic drug available, now its need to focus on medicinal plants which are considered to be effective, safer, nontoxic & having anti dengue property.^[16]

Table no: 02a- Medicinal plant & their properties used in dengue

Properties of drug	^[17] Aaragvadha	¹⁸ Papaya	¹⁹ Dhatura	^[20] Tulsi	^[21] Chirayata
Rasa	Madhura, tikta	Katu, tikta	Madhura, katu, Kashaya, tikta	katu, Kashaya, tikta	Tikta
Guna	Guru	Laghu, ruksha, tikshna	Tikshna, guru, ruksha	Laghu, ruksha	Laghu, ruksha
Virya	Ushna	Ushna	Ushna	Ushna	Sheeta
Vipaka	Madhura	Katu	Katu	Katu	Katu
Karma	Rechana (purgation)	Kaphavatashamak, swedajanaan (increase sweating), kusthaghna (decrease skin diseases)	Krimihara (decrease infection), kanduhara (reduce itching), vranahara (reduce wound)	Krimigna (decrease infection), Vranashodhaka (cleaning of wound)	Shothhara (reduce inflammation), swasahara (reduce cough), Dahahara (decrease burning sensation)

PAPAYA (Carica papaya)

Regenerate WBCs & Platelets, support immune system with vitamin A,C,E. Papaya leaf as an integral part of

chemotherapy treatment. Some constituent of papaya leaf are following to help the treat dengue.

Table no. 02b: Action of Papaya against dengue

S.No.	Chemical constituent	Action
1	Papin, chemopapin	Stimulate/improve megakaryocytes ↓ Produce sufficient no. of platelets
2	Carboplatin	Multi lineage hemopoietic cell ↓ mature in nature & doesn't affect stem cells
3	Flavinoids	Shown anabolic effects ↓ Stimulant effect on blood cell production
4	Tannins	Large polyphenolic compound ↓ Containing sufficient hydroxyls & other carboxyl ↓ To form strong complexes with protein and other macromolecules ↓ Increase retraction events release individual pro-platelets ↓ Increase platelet count

Table no. 03: Pharmaceutical action of chosen drugs

Drug	Action
Papaya	^[22] Regenerate WBCs, platelets. Support immune system, Muscle relaxant Anti-microbial, antiseptic, reduce inflammation, healing bed sores, anti-hyperlipidemic, use in intestinal worm.
Tulsi	^[23] Analgesic, antioxidant, antiviral, protection from radiation poisoning, carminative antispasmodic.
Aaragvadha	^[24] Antipyretic, analgesic, astringent Uses in cough, liver diseases, swelling of neck, skin eruption, rheumatic ulcer.
Dhatura	^[25] Analgesic, antihistaminic, sedative, bronchodilator, intoxicant, decrease seriousness of dengue fever.
Chirayata	^[26] Antihistaminic, antiviral, antioxidant, anti-inflammatory Uses in reduction of fever, skin diseases, loss of appetite, malaria, lowering

blood sugar.

GENERAL TREATMENT

- ^[27]**Vrihatvatachintamani rasa with anupana of tagaradi kwath** - As per the Samprapti of the disease; it is Vatapradhana Tridoshaja, thus it vitiates the Vata and pitta dosha, also indicated for the management of sannipataja Jwara.
- Contains Gold which acts as Immuno-modulator.
- ^[28]**Guduchi satva & guduchyadi kwath** – Best immuno-modulator. Pacifies vitiated pitta & raktadosha. Indicated in Rakta-pitta & Jeerna Jwara (chronic fever).
- ^[29]**Aarogyavardhini vati** – Tridoshanashaka(reduce tridosha), Rasayana(increases immunity), useful in Yakrit-pleehavikara (act on liver & spleen diseases), Resolves Mandagni.
- ^[31]**Trikatu choorna** – Tridoshanashaka (equiliberim of tridosha), srotoshodhaka(clearing of srotosh), indicated in Kasa-shwasa(cough, cold, asthma), mandagni(indigestion).
- ^[32]**Sitopaladi choorna** – Indicated in Shirahshoola(headache), shushkakasa(dry cough), aalasya(laziness), aruchi(anorexia), rakta-pitta(bleedingdisorder), jwara(fever).

CONCLUSION

This study gives an elaborate understanding of dengue fever through Ayurveda. Due to virus infestation and irregular nature of fever; it is correlated with various types of Jwara. As its onset is abrupt & affects a large community; therefore can be correlated with Janpadodhwansa. Infection has progressed rapidly. With the hope of heralding a new era where the clinician is better armed to combat infection and promote human health by traditional medicine. Ayurveda has many herbal and herbo-mineral formulations in different dosage forms for the treatment of Dengue fever. In spite of several clinical trials there is need of more clinical trials and pharmaceutical studies to establish their pharmacokinetic and pharmacodynamic properties on modern parameters. By using these drugs alone or as adjuvant with modern drugs Dengue fever can be controlled and cured.

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