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A Review On Ayurvedic Remedies For Dengue

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ABSTRACT :

Dengue is an acute viral illness caused by an RNA virus of the family Flaviviridae and spread by Aedes mosquitoes. The dengue virus, a member of the genus Flavivirus, is an arthropod-borne virus with four different serotypes (DEN-1, DEN-2, DEN-3, DEN-4). The World Health Organization (WHO) considers dengue a major global public health challenge in tropical and subtropical nations. The incidence of dengue increased significantly from 1960 to 2010 due to factors such as population growth, global warming, unplanned urbanization, and frequent air travel. Approximately 2.5 billion people live in dengue-endemic regions, with about 400 million infections occurring annually and a mortality rate of 5-20% in some areas. Dengue affects more than 100 countries, including Europe and the United States.

Dengue, also known as break-bone fever (Haddi-Tod Bukhar), is a viral infection transmitted from mosquitoes to humans. It is a leading cause of arthropod-borne viral disease worldwide and is also referred to as 7-day fever. Annually, there are about 100 million cases of dengue, resulting in 20,000 to 25,000 deaths. This disease presents a substantial public health challenge, marked by epidemics across different regions globally.

Keywords: Dengue, Disease, Fever, Viral, Arthropod borne

INTRODUCTION-:

The dengue virus is an arthropode-borne virus with four distinct serotypes (DEN-1, DEN-2, DEN-3, and DEN-4). It belongs to the genus Flavivirus of the family Flaviviridae.[1,2] Dengue is regarded by the World Health Organization (WHO) as a serious worldwide public health concern in tropical and subtropical countries. Between 1960 and2010, dengue cases increased thirty times globally. These factors include a faster rate of population expansion, global warming, unplanned urbanization, ineffective mosquito control, frequent air travel, and a shortage of health care services.[3,4,5] Dengue is a disease that affects 2.5 billion people worldwide[5], with 400 million cases of infection annually and a death rate that can reach 5–20% in some locations.[6] More than 100 countries are afflicted with dengue infection, including the USA and Europe.[7], The first known instance of dengue similar sickness in india was in Madras in 1780, the first virologically confirmed outbreak of DF in India occurred in Calcutta and Eastern Coast of India in 1963-1964.[8] A dengue virus infection can have a variety of clinicalThe most widely distributed mosquito-borne illness is dengue, which is widespread in over 100 countries. Information about dengue illness burden, its frequency, incidence and geographic distribution is crucial in designing suitable control measures against dengue fever. In many endemic Asian and South American countries, dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS) are among the leading causes of morbidity and mortality among children (Gubler 1998; Guha-Sapir & Schimmer). We conducted a systematic review and meta-analysis of dengue fever in India.

Dengue has been estimated to have caused 12,000 deaths in South-east Asia, 4000 deaths in the Western Pacific, and 2000 deaths in America in 2002 based on data from 112 national vital registry systems (World Health Organization 2004). The Technical Advisory Committee developed the current World Health Organization (WHO) case classification system into DF/DHF/DSS during its 1974 meeting in Manila, Philippines (WHO Technical Report Series 1975). This system was largely based on the groundbreaking studies conducted at the Children's Hospital in Bangkok, Thailand in the 1960s that defined the disease pattern of that era. Although some small alterations have been suggested, generally the case definition and case classification of dengue have remained the same.

(The term ‘Dengue case definition’ for having or not having a case with dengue disease and the word ‘Dengue case classification’ as the grouping of dengue disease manifestation into ‘DF/DHF/DSS and others’ have been used throughout the article.) These were released in 1980, 1986, and 1997 by the World Health Organization's headquarters as well as by its regional offices (WHO 1993, 1995a, 1995b, 1998, 1999; Pan American Health Organization 1994). There are four severity levels for the DHF.within A positive TT is the only hemorrhagic symptom seen in grade I.

Spontaneous bleeding is seen in grade II, typically in the skin, through the nose, or in the internal organs. Grade III symptoms include hypotension relative to age, a narrow pulse pressure of 20 mmHg or less, restlessness, and a quick, weak pulse. Grade IV shock is defined as undetectable blood pressure or pulse. The DSS is made up of grades III and IV. Dengue fever continues to be a serious and expanding global public health concern. It is clear that better dengue surveillance is required, as the most recent study estimated that 390 million illnesses occur annually worldwide.

In the long run, tracking disease patterns and identifying outbreaks depend on dengue monitoring. Outbreak signals are especially crucial for mobilizing vector control and priming or reorganizing healthcare delivery facilities in anticipation of a spike in suspected cases, as they enable prompt actions. Aedes mosquitoes spread the dengue virus (DENV), which is the source of this arthropod-borne infectious disease. Every year, between 50 and 100 million people contract DENV, placing a heavy financial strain on both governments and private citizens[4,5].

We conducted a systematic review and meta-analysis to synthesize data on the epidemiology, clinical characteristics, serotype distribution, and risk factors associated with global dengue outbreaks from 1990 to 2015. Our search of the PubMed, Embase, and Web of Science databases, concluding in December 2016, using the term "dengue outbreak," yielded 3,853 studies. Ultimately, 243 studies detailing 262 dengue outbreaks met our inclusion criteria.

Most outbreak-related dengue cases were reported in the Western Pacific Region, especially after 2010, with significant cases originating from China, Singapore, and Malaysia. The average age of dengue-infected individuals was 30.1 years, with 54.5% being male. Among the patients, 23.2% experienced dengue hemorrhagic fever (DHF), 62.0% had secondary infections, and the mortality rate was 1.3%.

Historically, only nine countries reported severe dengue epidemics before 1970. In contrast, dengue fever now affects over 100 countries in tropical and subtropical regions (World Health Organization, 2016). The WHO estimates that 50–100 million dengue infections occur each year, with a remarkable 30-fold increase in global incidence over the past 50 years (WHO, 2012). Today, the dengue virus (DENV) represents a significant global public health threat, with about two-fifths of the world's population at risk (Lancet, 2013; Screaton et al., 2015).

While research has primarily focused on virus transmission in urban environments, there is a growing body of evidence indicating high levels of DENV infections in rural populations. Some researchers suggest that increased human travel and improved transportation infrastructure have facilitated the spread of the virus between urban and rural areas. Additionally, urban characteristics that heighten risk—such as population density and suitable habitats for Aedes aegypti—are increasingly found in rural settings. Moreover, many DENV infections are asymptomatic, leading to an underestimation of the disease burden, particularly in regions with less developed surveillance systems.[1,4,5]

CAUSES AND RISK FACTORS –

The clinical characteristic most frequently linked to severe dengue is the presence of comorbidities or underlying health conditions, which showed a statistically significant association. In terms of sociodemographic factors, individuals under 18 years of age were commonly identified as being at higher risk; however, the study by Luppe MJ et al. (2019) suggested this age group might actually be a protective factor. Additionally, being white or Caucasian was consistently identified as a risk factor in all studies that evaluated this demographic variable.[1]

Among the signs and symptoms significantly associated with severe dengue, abdominal pain or tenderness, bleeding or hemorrhagic manifestations, hepatomegaly, splenomegaly, and changes in red blood cell counts were most common. Symptoms such as prostration, lethargy, and fatigue were also consistently associated with severe dengue across various studies.[4,5]

While many dengue infections are asymptomatic, those that do present symptoms often include:

1. High fever (104°F / 40°C)
2. Rash
3. Intense pain behind the eyes
4. Nausea or vomiting
5. Muscle, bone, and joint pain

Symptoms typically emerge 4 to 10 days after a mosquito bite and can last between three to seven days. About 1 in 20 people infected with dengue may develop severe forms of the disease after initial symptoms subside. Severe dengue, which includes dengue hemorrhagic fever, is a life-threatening condition characterized by the following warning signs, often occurring within 24 to 48 hours:

1. Severe abdominal pain
2. Frequent vomiting
3. Vomiting blood or blood in the stool
4. Nosebleeds or bleeding gums
5. Extreme tiredness
6. Restlessness
7. Irritability

Recognizing these symptoms early is crucial for timely medical intervention.[1,2,4]

COMPLICATIONS OF DENGUE FEVER

Dengue fever, resulting from the dengue virus transmitted mainly by Aedes mosquitoes, is widespread in tropical and subtropical areas. While many cases are mild and resolve without intervention, dengue can lead to severe complications, especially among vulnerable populations. Understanding these complications is essential for effective management and prevention strategies.[2]

1. Dengue Hemorrhagic Fever (DHF)

Dengue Hemorrhagic Fever (DHF) is one of the most severe complications of dengue. It is marked by increased vascular permeability, a reduction in platelet counts (thrombocytopenia), and various bleeding manifestations. If not addressed, DHF can progress to severe dengue, which may involve:

1. **Bleeding symptoms**: Patients may experience petechiae (tiny purple spots), bleeding from the gums, or severe gastrointestinal bleeding.

2. **Fluid accumulation**: The leakage of fluid from blood vessels can lead to conditions such as pleural effusion (fluid in the chest) or ascites (fluid in the abdomen).
3. **Shock**: Significant fluid loss can result in dengue shock syndrome (DSS), presenting as dangerously low blood pressure and inadequate blood flow to organs.[1,7]

2. Dengue Shock Syndrome (DSS)

Dengue Shock Syndrome is a life-threatening condition that can develop from severe plasma leakage, resulting in substantial hypotension and shock. Immediate medical intervention is critical. Symptoms include:

1. **Intense abdominal pain**: Often accompanied by persistent vomiting.
2. **Restlessness and irritability**: Signs of reduced blood flow to the brain.
3. **Cold, clammy skin**: Indicative of circulatory failure.

Without treatment, DSS can lead to multi-organ failure and death.[4,5]

3. Organ Impairment

Severe dengue can cause damage to several organs, particularly:

1. **Liver**: Patients may experience elevated liver enzymes, jaundice, and in severe cases, liver failure.
2. **Heart**: Conditions like myocarditis (inflammation of the heart muscle) or pericarditis (inflammation of the lining around the heart) can arise, leading to irregular heartbeats and cardiovascular instability.
3. **Kidneys**: Acute kidney injury may occur due to dehydration, shock, or direct viral effects[5,6].

4. Neurological Complications

Although uncommon, dengue can also lead to neurological complications, such as:

1. **Encephalitis**: This inflammation of the brain can cause seizures, altered consciousness, and neurological deficits.
2. **Guillain-Barré Syndrome**: An autoimmune condition that can manifest post-infection, leading to muscle weakness and paralysis.[4,5]

5. Long-term Effects

Some individuals may experience lingering effects after recovering from dengue, which can include:

1. **Fatigue and malaise**: Many report prolonged recovery times, affecting daily life and productivity.
2. **Mental health issues**: Experiences of severe illness can lead to depression and anxiety.
3. **Chronic symptoms**: Persistent joint pain and muscle aches are not uncommon.

6. Increased Risk with Re-infection

A significant concern with dengue is the increased risk of severe illness upon re-infection with a different serotype. This is known as antibody-dependent enhancement (ADE), where antibodies from a previous infection facilitate the entry of the virus into cells during a subsequent infection, potentially leading to more severe disease.[6]

7. Management and Prevention

Effective management of dengue complications is vital for reducing morbidity and mortality:

1. **Monitoring**: Close observation of vital signs, hematocrit levels, and platelet counts is crucial in suspected severe cases.
2. **Fluid management**: Administering intravenous fluids carefully can prevent shock without leading to fluid overload.
3. **Symptomatic treatment**: Pain relief is typically managed with acetaminophen, while NSAIDs should be avoided due to bleeding risks.
4. **Preventive strategies**: Controlling mosquito populations through eliminating breeding sites and using insect repellent is essential to reduce the risk of severe dengue.[1,4,7]

PATHOPHYSIOLOGY OF AEDES AEGYPTI VIRUS INFECTION

When the Aedes aegypti mosquito bites, the virus enters the skin. It specifically targets Langerhans cells, which play a crucial role in immune responses. Inside these cells, the virus begins to replicate. To combat this, Langerhans cells produce interferons, which help limit the virus's spread.[2]
Infected Langerhans cells then migrate to the lymphatic system, signaling the immune system to respond. This migration leads to viremia, characterized by elevated levels of the virus in the bloodstream. As the immune response is activated, there is an increase in lymphocyte production, while neutrophil and overall white blood cell counts decrease.
Additionally, the release of pyrogens triggers fever, and increased blood pressure in the blood vessels can result in rashes. This sequence of events highlights the body's complex response to viral infection and the subsequent physiological changes that occur.[4]

ALLOPATHIC REMEDIES -:

Dengue fever currently has no specific antiviral treatment. Management focuses primarily on supportive care and alleviating symptoms. Here are some common allopathic approaches used in the treatment of dengue:

1. **Hydration:** It's crucial to maintain proper fluid intake. Oral rehydration solutions, plain water, and electrolyte drinks can help prevent dehydration, particularly if the patient is experiencing vomiting or diarrhea.
2. **Pain and Fever Relief: Acetaminophen (Paracetamol):** This is often recommended to relieve pain and reduce fever. It is preferred over non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or aspirin, as these can increase the risk of bleeding.
3. **Monitoring:** Regular checks of platelet count and hematocrit levels are important, especially in severe cases, to identify any potential complications early.
4. **Blood Transfusions:** In cases where there is significant bleeding or critically low platelet counts, blood transfusions may be required.
5. **Rest:** Adequate rest is essential to aid recovery.[1,4,6]

PLANT USED FOR MANAGEMENT -:

Several plants and herbal remedies are often utilized to support the management of dengue symptoms. While these should not replace conventional treatments, they can serve as complementary options. Here are some commonly referenced plants:

1. **Papaya Leaf (Carica papaya):** Traditionally believed to help increase platelet counts, with juice from the leaves frequently consumed for this purpose.[7]
2. **Giloy (Tinospora cordifolia):** Renowned for its immune-boosting effects, it is often used to help reduce fever and enhance overall wellness.
3. **Neem (Azadirachta indica):** Traditionally employed for its anti-inflammatory and antiviral properties, neem leaves can be brewed into a tea.[6]
4. **Tulsi (Holy Basil, Ocimum sanctum):** Valued for its antioxidant and anti-inflammatory effects, tulsi tea is often consumed to alleviate symptoms such as cough and fever.
5. **Coconut Water:** While not a plant, it is highly recommended for maintaining hydration and replenishing electrolytes due to its rich potassium content.
6. **Ginger (Zingiber officinale):** Known for its anti-inflammatory qualities, ginger tea can provide relief from symptoms and aid digestion.
7. **Turmeric (Curcuma longa):** Contains curcumin, which is known for its anti-inflammatory and antioxidant properties, and can be included in food or taken as a supplement.
8. **Amla (Indian Gooseberry, Phyllanthus emblica):** Rich in vitamin C and antioxidants, amla is believed to support immune function and overall health.[2]

CONCLUSION-:

Dengue fever poses a substantial public health challenge in various parts of the world, marked by its intricate pathophysiology and varied clinical presentations. Although there is no specific antiviral treatment available, the importance of early diagnosis and supportive care cannot be overstated, as these are key to managing the disease and minimizing complications. Implementing preventive strategies, such as vector control and robust public health initiatives, is critical for curbing the spread of dengue and safeguarding at-risk populations.

Research into traditional and herbal remedies offers potential complementary approaches to symptom management and recovery. However, these should be utilized with caution and ideally under the guidance of healthcare professionals. Ongoing surveillance, comprehensive research, and active community engagement are essential for enhancing treatment outcomes and developing effective interventions against dengue. By focusing on prevention and efficient management, we can work toward alleviating the impact of this disease and strengthening public health systems globally.

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