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**Review Article** 

# **DENGUE FEVER IN PAKISTAN; REVIEW STUDY**

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# Abstract:

Dengue is a widespread mosquito-borne infection in human beings, which in recent years has become a major international public health concern. Symptomatic dengue virus infections can present with a wide range of clinical manifestations, from a mild febrile illness to a life-threatening shock syndrome. Both viral and host factors are thought to contribute to the manifestations of disease in each infected. It is important to understand its burden on health care, morbidity and mortality. Early diagnosis and suspicion of DF in primary care might reduce the complications if handled properly. We must understand the depth of the problem in terms of its transmission, clinical presentation, diagnosis, management and prevention.

Keywords: Dengue, Clinical features, Pathogenesis, Diagnosis, Treatment.

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# **INTRODUCTION:**

Dengue fever is the most frequently spreading mosquito bite disease and it is the major health problem in tropical and subtropical areas throughout the world[1]. The word dengue was first described by Benjamin Rush in 1789 it is a Spanish word which means "fastidious", it is derived from "dinga" which means an evil of spirit and break bone fever [2]. The causative agent of dengue fever belongs to the genus Flavivirus and family Flaviviridae. Dengue virus is transmitted to human via bite of infected female mosquito of the genus Aedes [3]. Dengue fever represents wide range of clinical symptoms including mild fever to sever forms[4]. Dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) are the worsen forms of dengue [5]. Severe headache, muscles and joints pain, rash, nausea, vomiting are the symptoms of dengue fever while DHF are characterized by high fever, haemorrhagic phenomena [6]. Dengue is the major cause of hospitalization, and it is estimated that 500 000 people infected with severe dengue require hospitalization in which children are dominant while about 2.5% affected people die annually[7].

Dengue virus (DV) is one of the most prevalent infections in the world which are transmitted by mosquitoes. These infections may be asymptomatic or may produce dengue fever (DF), undifferentiated fever and dengue haemorrhagic fever or dengue shock syndrome (DHF/DSS). Four antigenically related but distinct viruses, DEN 1, DEN 2, DEN 3, and DEN 4, are considered as aetiological agents of DF.<sup>1</sup> DF is an acute febrile condition [8]. Infected Aedes mosquito (Aedes aegypti) is the most important vector for the transmission of virus to humans. The virus is affecting population at a large scale and causing high mortality rate. About three billion people in more than 100 countries of tropical and subtropical regions are prone to DV infection. Lymphoma, leukopenia, lymphocytosis, high haematocrit and thrombocytopenia are common clinical characteristics of patients suffering from DV infection. Secondary infections associated with different serotypes which are responsible for primary infections are considered as factors linked with epidemiology of DHF/DSS. Many diagnostic tests are in practice for the dengue infection, but there is a need to initiate more specific and low-cost diagnostic tools for the early diagnosis of dengue illness [9, 10]. Delay in the diagnosis and failure to identify the complications may result into worse outcomes.

# **Local Prevalence:**

In 1994 Pakistan first complaint an outbreak of dengue fever. The epidemics in Sri Lanka and India

were associated with multiple dengue virus serotypes, but DEN-3 was predominant and was genetically distinct from DEN-3 viruses previously isolated from infected persons in those countries. [11]. Dengue virus is now indigenous in Pakistan, circulating throughout the year with a peak incidence in the post monsoon period. Recent flood in Pakistan made the situation worse. Pakistan reported 1.809 suspected Dengue out of which 881 confirmed till 11th October 2010 with 5 deaths while 16 confirmed cases reported in Islamabad without any mortality. In primary health care units mild to moderate fever treated as suspected dengue fever. Researchers have identified that co-circulation of DEN-2 and DEN-3 was responsible for the 2006 outbreak in Karachi. Primary and secondary cases were seen in both groups. Cases with DHF showed marginal association with DEN-2. Introduction of a new serotype (DEN-3) and or a genotypic shift of endemic serotype (DEN-2) are the probable factors for the recent outbreak of DHF in this region [12].

Clinical features of DF: Most clinical infections are asymptomatic where the disease starts from mild flu-like sickness to severe intricate condition, characterised by leakage from vessels, haemorrhage and shock, which results in the death of the patient. DF is described as febrile illness. Half of the patients face skin problems while Fever remains 5-7 days. During first 24-48 hours flushed faces are commonly observed. During the period of suspension, maculopapular or petechial rashes are detected in patients[13]. Clinical symptoms are described as headache, fever, skin rashes, leukocytopenia and pain in bones and muscles. Because of uncompromising pain DF is also known as break bone fever. Pal et al. found that there is an important correlation between dengue viral load (VL) and the level of interferon-gamma (IFN-g). They concluded that there is powerful correlation of nausea, fever, pain, aches, rash and pain, constant vomiting and leukopenia [14]

#### **Pathophysiology:**

Dengue fever is caused by four antigenically distinct dengue virus serotypes: DENV-1, DENV-2, DENV-3, and DENV-4. All four types of virus have the capacity to cause severe disease. They are belong to the Flavivirus genus/Flaviviridae family, which also includes the yellow fever virus, West Nile virus, Japanese encephalitis virus, and the St Louis encephalitis virus [15]. The primary vector for spread of infection is A aegypti, a highly domesticated, day biting mosquito, with A albopictus also responsible for transmission. Although the mosquitoes are of Asian origin, they now occur in Africa, Europe, and the US. both vector and virus has transmitted through International travel and transportation of goods[16]. The virion consists of three structural proteins plus a lipoprotein envelope and seven non-structural proteins, of which non-structural protein 1 (NS1) has diagnostic and pathological importance. Infection with any one serotype confers lifelong immunity to that specific serotype; cross protection to other serotypes, however, lasts only a few months [17] Some studies have shown that infection with the DENV-1 or DENV-2 serotype may result in more severe infection.9 10 Pathogenesis is linked to the host immune response, which is triggered by infection with the virus [18] Primary infection is usually benign. Secondary infection with a different serotype or multiple infections with different serotypes may, however, cause severe infection that can be classified as either dengue hemorrhagic fever or dengue shock syndrome, depending on the clinical signs. Antigen-presenting dendritic cells, the humoral immune response, and the cell mediated immune response are involved in the pathogenesis [19]. Proliferation of memory T cells and the production of pro-inflammatory cytokines lead to vascular endothelial cell dysfunction, which results in plasma leakage.

#### **Primary prevention:**

The World Health Organization recommends strategies for the prevention and control of dengue infection and authorities in dengue endemic regions may also produce their own prevention programmes and initiatives. Communities dengue endemic regions should be educated to recognize symptoms and prevent transmission [21]

# Secondary prevention:

Recurrence is possible, with different serotypes leading to a secondary infection. After recovery from an initial infection the usual primary prevention measures should be followed.

## Management:

The management is entirely supportive like keeping body temperature below 39°C, give the patient paracetamol (not more than four times in 24 hours. Patients are advised to avoid Aspirin or Brufen/ Ponston. They are suggested to drink large amounts of fluids which include water, soups, milk and juices. The patient should rest is the fever is continuous for three days CBC must be done to prevent worsening of condition. ORS should be given even there is no remarkable clinical dehydration. Intravenous fluid should be given according to the patients' need it is lifesaving if administered on proper time [22].

## Health education and Prevention:

Primary care professionals have the ability to provide extensive care program for most patients, given adequate training, resources, and, when needed, specialist advice. General practitioners and community nurses can play a major role in health education and hygiene [23] The popular sources of information like newspapers and television should be used to disseminate information on a large scale [24]. Protection from the mosquito bite should be done by wearing full-sleeve clothes and long dresses to cover the limbs use of repellents, mosquito coils and electric vapour mats during the daytime. To protect young children, pregnant women, old people there are Insecticide treated nets (ITNs) are available, in addition to others who may rest during the day. Drainage of water from desert/window air coolers when not in use, in addition to tanks, barrels, drums, and buckets. objects containing water such as plant should be removed from the house. All stored water containers should be covered properly at all times. [25]. Proper solid waste disposal and improved water storage practices, including covering containers to prevent access by egg laying female mosquitoes, are encouraged through community-based programs [26].

### **CONCLUSION:**

Physicians have important role to play in providing care, support and identifying the sign of imminent hemorrhage which is serious consequences of Dengue Fever needs referral to tertiary care for intravenous fluid replacement, platelet transfusion along with supportive care. Public awareness campaigns need to initiated at all levels. Doctors in primary health care setting have lucky chance not only give the best possible supportive care to their patients but also educate them regarding the spread of Dengue fever and vector control.

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