Short Communications

Dengue Taking a High Toll On South Asian Nations

Chalise RS[1], Chalise BS[2]

Introduction

Dengue, also known as break-bone fever due to the severe pain is a viral infection and more common in tropical and subtropical climates like in Bangladesh. Dengue is a RNA virus and the disease is transmitted by infected mosquito. About 75% cases of dengue who get dengue will not have any symptoms. In dengue the most common symptoms are high grade fever, headache, body aches, nausea, and rash. Most will get better in 1–2 weeks. Some people develop severe dengue and need care in a hospital.

Burden Of Disease

Dengue fever is the fastest-spreading mosquito-borne viral disease, affecting 100-400 million people annually worldwide. Dengue is the leading cause of arthropod-borne viral disease worldwide, posing a significant global health concern. Endemic across most provinces in Bangladesh, dengue incidence has increased in recent years largely due to expansion of the vector Aedes aegypti and Aedes albopictus, as well as the movement of people and the introduction of imported cases. The disease is widespread throughout the tropics with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control services in urban areas. It is estimated to infect 390 million people annually of which 96 million manifests clinically. One study on prevalence of dengue estimates that 3.9 billion people in 128 countries are at risk of infection with dengue viruses. Before 1970, only 9 countries had experienced severe dengue epidemics, today the disease is endemic in more than 100 countries.[1,2,3]

Vector Characterictics

Dengue is caused by a flavivirus of 4 virus serotypes (DENV1, DENV2, DENV3, DENV4). Over the past 20 years, these serotypes have spread worldwide from South East Asia and are now found throughout Asia, Africa and the Americas. (Figure: 1) International travel, trade, migration, decreased access to health care and urbanization are considered among the main drivers behind the rapid dissemination of all four dengue serotypes. Compounding the problem has been the global spread of the dengue mosquito vectors, Ae. aegypti and Ae. albopictus, throughout the last century.[4]

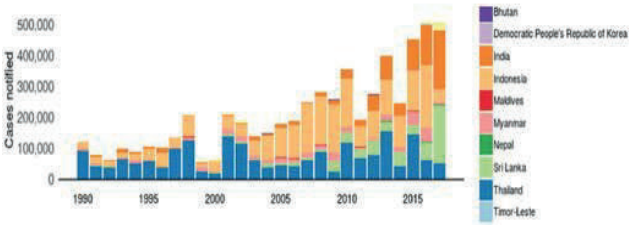

Figure: 1 Dengue cases notified by SEAR countries to WHO during the period 1990-2017

Dengue is transmitted primarily by the female mosquito Aedes aegypti, which thrives in and around urbanized areas. It is diurnal and highly anthropophilic, with domestic forms showing increased propensity towards exclusive human feeding. It has greater competency for transmission than Ae. albopictus, and coupled with short, frequent biting behavior, it can transmit dengue multiple times during a single gonotrophic cycle. Once infected, humans are the main carriers and multipliers of the virus, serving as a source of virus for the uninfected mosquitoes. The virus circulates in the blood of an infected person for 2-7 days, at approximately the same time that the person develops a fever.

Clinical Features And Management

After an incubation period of 4- 10 days, dengue virus can produce a wide spectrum of illness although most infections are asymptomatic or mildly symptomatic.

1. Rashmi Sharma Chalise, Graduate Student, Khulna City Medical College, Khulna, Bangladesh
2. Dr. Bimal Sharma Chalise, Consultant (Internal Medicine), Sukraraj Tropical & Infectious Disease Hospital, Kathmandu, Nepal

Corresponding Author: Rashmi Sharma Chalise, Graduate Student, Khulna City Medical College, Khulna, Bangladesh
Email: rassmee2059@gmail.com

Received : 01/12/2024 **Accepted :** 15/12/2024

Most common symptoms are high grade fever, headache, body aches, nausea, and rash. Most of the time dengue disease has three phases febrile phase which last for 2-7days than critical phase and recovery phase. In humans, recovery from infection by one dengue virus provides lifelong immunity against that particular virus serotype. However, this immunity provides only partial and transient protection against subsequent infection by the other three serotypes of the virus. Some evidence show that sequential infection increases the risk of developing severe dengue. The severity of the disease is determined by the individual risk factors such as secondary infection, age and presence of co- morbid conditions like diabetes mellitus, sickle cell anemia, renal disease, etc. there is no specific medicine for the management of dengue. Patient should be managed symptomatically. According to World Health Organization Dengue case is classified as Dengue without warning signs, Dengue with warning signs and severe Dengue.

Situation Worldwide And In Bangladesh

Dengue was first recorded in the 1960s in Bangladesh (then known as East Pakistan) and was known as "Dacca fever". Since 2010 cases of dengue appear to coincide with the rainy season from May to September and higher temperatures. Bangladesh's climate conditions are becoming more favorable for the transmission of dengue and other vector-borne diseases including malaria and chikungunya virus due to excessive rainfall, waterlogging, flooding, rise in temperature and the unusual shifts in the country's traditional seasons.

Climate conditions like temperature, humidity, and rainfall impact the life cycle of mosquitoes and the pathogen it harbors and influences the distribution and prevalence of both the virus and its vector. In South Asia, the peak season for dengue is from June to September, when climate conditions are most favorable for the mosquito to thrive and spread dengue. Dengue cases rise from mid-June to September due to heavy rainfall and humidity. Frequent outbreaks of dengue in South Asia are often attributed to a lack of public awareness, insufficient health infrastructure, and poor vector control measures. Many people in the region are not aware of the risk associated with dengue and do not take appropriate measures to protect themselves from the disease. Additionally, the health infrastructure in many parts of South Asia is inadequate, and there is a shortage of medical supplies and trained personnel. This can make it difficult to diagnose and treat cases of dengue and can lead to delays in the implementation of effective control measures. Finally, vector control measures, such as the use of insecticides and the elimination of breeding sites, are often inadequate or poorly implemented. This allows the mosquito vector to thrive and spread the virus, leading to frequent outbreaks of the disease. Overall, addressing these issues will be critical in reducing the burden of dengue in South Asia.

Situation At Glance

From 1 January to 7 August 2023, the Ministry of Health and Family Welfare of Bangladesh reported a total of 69 483 laboratory-confirmed dengue cases and 327 related deaths, with a case fatality rate (CFR) of 0.47%. Of these, 63% of cases and 62% of the deaths were reported in the month of July 2023. Although dengue is endemic in Bangladesh, the current dengue surge is unusual in terms of seasonality and the early sharp increase in comparison to previous years, where the surge started around -late June. The CFR so far this year is relatively high compared to previous years for the full-year period. The pre-monsoon Aedes survey shows that the density of mosquitoes, and the number of potential hotspots is at the highest level in the past five years. The higher incidence of dengue is taking place in the context of an unusual episodic amount of rainfall, combined with high temperatures and high humidity, which have resulted in an increased mosquito population throughout Bangladesh.[5]

References

1. Waggoner, J.J., et al., Viremia and Clinical Presentation in Nicaraguan Patients Infected Wi1. Waggoner, J.J., et al., Viremia and Clinical Presentation in Nicaraguan Patients Infected With Zika Virus, Chikungunya Virus, and Dengue Virus. Clinical Infectious Diseases, 2016. 63(12): p. 1584-1590.
2. Bhatt, S., et al., The global distribution and burden of dengue. Nature, 2013. 496(7446): p. 504–507.
3. Brady, O.J., et al., Refining the global spatial limits of dengue virus transmission by evidence-based consensus. PLOS Neglected Tropical Diseases, 2012. 6(8): p. e1760.
4. National Guidelines on Prevention, Management and Control of Dengue in Nepal
5. World Health Organization (11 August 2023). Disease Outbreak News; Dengue in Bangladesh. https:// www.who.int /emergencies/disease-outbreak-news/item/2023-DON481