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LETTER TO THE EDITOR

Dengue: A Brief Insight

Sharmin Sultana^{1,*}, Faisal Muhammad^{1,2,3}, ABM Alauddin Chowdhury¹, Nadira Mehriban¹ and Salim Khan⁴

¹Department of Public Health, Faculty of Allied Health Sciences, Daffodil International University, Daffodil Smart City, Birulia, Savar, Dhaka 1216, Bangladesh

²Faculty of Health Sciences, Frontier University, Garowe Campus, Puntland, Somalia

³Otu Institute of Research and Training, Kano, Nigeria

⁴Department for Therapies and Public Health, Faculty of Health, Education and Life Sciences, Birmingham City University, Birmingham, UK

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Dear Editor,

Dengue is the second most dangerous vector-borne disease worldwide in terms of incidence and mortality rate [1]. Many nations are experiencing dengue outbreaks, including the Americas, Africa, the Middle East, Asia, and the Pacific Islands [2]. Dengue, also known as dengue fever (DF), is a viral disease that is carried and spread by female mosquitos, mostly *Aedes aegypti* and to a lesser extent, *Aedes albopictus*. The virus belongs to the Flaviviridae family and has four separate but closely related serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) [3]. Whilst there are four types of the dengue virus, it is still possible to be re-infected as the immune system only becomes immune to one serotype at a time.

Dengue is widespread and particularly found in tropical and subtropical climates. Urban and semi-urban regions present increased case numbers. Mosquito bites are more prevalent in early mornings and early evenings, particularly near still water in built-up areas [3]. Around 100 to 400 million infections are thought to occur annually, with more than 80% being minor and asymptomatic [3].

Approximately 380, 171 dengue virus cases and 113 deaths were reported worldwide between January 1st to 9th March, 2023. Most cases were reported from Brazil (240, 482), Bolivia (31, 283), Peru (20, 022), Colombia (15, 972), and Nicaragua (13, 187). Most deaths were reported in Bolivia (26), Peru (26), Brazil (24), Sudan (14), and Bangladesh (9) [4].

Bangladesh, a country in South Asia, has a lower seroprevalence of dengue than other nations in Southeast Asia [5], but conditions are changing quickly. The country is in tropical and subtropical zones and presents a favorable environment for the dengue vector and its accelerated spread

[6]. In 2023, Bangladesh reported the highest case of DF in Asia [4]. A previous study in 2019 estimated that dengue affected on average 2.4 million people annually in Bangladesh, with concentrations being higher in major cities, including the capital Dhaka [7]. In addition, men were found to be more susceptible to infection as they have increased incidence rates which may be attributed to increased frequency of travel and exposure to external environments [7]. Mortality levels, however, do not relate to infection rates as more women die from the mosquito-borne viral disease [8]. Furthermore, a study in India (2022) found a high incidence of DF in children aged 5 to 10 years [9] and determined that this age range was a risk factor.

Symptoms of DF include a high temperature or feeling hot and shivery. In addition, severe headaches, pain behind the eyes, muscle and joint pain, feeling sick, and the presence of a widespread rash. Other symptoms include hepatomegaly, abdominal pain, and oliguria. Moreover, impaired awareness upon hospital admission was also frequently noticed, particularly in those who succumbed to DF [10].

DF can range from asymptomatic or self-limiting to severe, characterized by plasma leakage (dengue hemorrhagic fever, DHF) and dengue shock syndrome (DSS). Dengue Shock Syndrome is a severe complication caused by an overreaction of the body's immune system to the virus. Mortality is linked to DSS and is approximately 50 times higher compared to those without DSS [11].

Several studies have also reported excessive menstrual bleeding in dengue-infected adolescents [12, 13]. In pregnancy, dengue is associated with preterm birth and low birth weight [14]. Other obstetrical pathologies include premature labor, particularly if infection occurs in the last trimester [15]; increased risk of miscarriage and hemorrhaging [16 - 18]; and potential congenital abnormalities in the newborn [19]. One cohort study found that dengue increased the risk of maternal

* Address correspondence to this author at the Department of Public Health, Faculty of Allied Health Sciences, Daffodil International University, Daffodil Smart City, Birulia, Savar, Dhaka 1216, Bangladesh;
E-mail: sharmin.rit@gmail.com

death 3-fold, and DHF increased the risk of maternal death by 450 times when compared to mortality rates of pregnant women not infected with dengue [20].

Although the primary mode of dengue transmission between humans involves mosquito vectors, maternal transmission to infants is also possible [3], in addition to the virus being sexually transmissible for a brief period after acute DF, and known to cause reversible changes in sperm [21].

It is well known that dengue infection affects the body's central nervous system [22, 23] and may result in psychological manifestations [24, 25]. Several studies have revealed DF to be significantly associated with depression, anxiety, and distress [26 - 28]; these are more prevalent in females [29 - 31] and infected children who demonstrated irritable mood, visual hallucination, agitation, and aggressiveness [32]. Moreover, transient myocardial depression is not uncommon in DSS patients [33] and may affect their clinical severity and level of fluid overload [33].

Dengue is a serious public health issue [3]. There is no specific treatment for the disease, only the symptoms can be relieved until the immune system can resolve the infection. Antipyretic treatment with paracetamol to relieve pain and fever is advised. Nonsteroidal anti-inflammatory medications (ibuprofen) and aspirin should be avoided as these can cause further bleeding problems in people with dengue. Fluid intake is important to prevent dehydration, particularly if vomiting or diarrhoea occurs. In cases of severe dengue (DHF), symptoms such as vomiting repeatedly; vomiting blood; breathing difficulties; cold clammy skin; weak fast pulse; or drowsiness/loss of consciousness warrant urgent medical assistance [34].

Currently, five different dengue vaccines are being investigated: a live attenuated vaccine, inactivated vaccine, a recombinant subunit vaccine, a viral vector vaccine, and a DNA vaccine [35]. The vaccines primarily work by enhancing immune responses against the E protein and non-structural protein 1 of the DENV [36]. Dengvaxia, a live-attenuated dengue vaccine is approved by the U.S. Food and Drug Administration and recommended for use [37].

Without a suitable cure for dengue, contact between people and vector is key to preventing infections. Several environmental, chemical, biological, and genetic approaches are also being used or developed to control mosquito populations and prevent dengue infections [3]. In addition, it is imperative that health educators and health promotion practitioners further increase awareness of dengue risk factors, particularly in countries with increased prevalence.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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