Dengue virus: Dengue infection in India:

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Abstract: As the epidemics of Dengue fever increasing in India, Most of states after other getting affected. It is very essential to know more about this disease and prevalence, any change in the viral strain, severity of the disease pattern, early detection and prompt diagnosis of the virus and early treatment of the disease resulting in good outcome. Community growth, rapid urbanization, increase in international travel from endemic areas and global warming are playing a major role in disease spread. Controlling the aforementioned factors is necessary to stop the transmission of illness and lessen the likelihood of epidemic flare-ups.

Keywords: Dengue, Epidemics, Diagnosis, Community, flare up, Urbanization, Endemics.

INTRODUCTION:
The dengue virus, a member of the genus Flavivirus of the family Flaviviridae, is an mosquito-borne virus that includes four different serotypes (DEN-1, DEN-2, DEN-3, and DEN-4).[1,2] These DENV can cause a spectrum of illness ranging from asymptomatic dengue infection to dengue fever (DF) to dengue hemorrhagic fever (DHF) to dengue shock syndrome (DSS). The World Health Organization (WHO) consider Dengue is a serious worldwide public health concern in tropical and subtropical countries. Dengue has seen a 30-fold upsurge worldwide between 1960 and 2010, due to increased population growth rate, global warming, unplanned urbanization, inefficient mosquito control, frequent air travel, and lack of health care facilities.[3-5] Surveillance for dengue fever in India is conducted through a network of more than 600 sentinel hospitals under the National Vector Borne Disease Control Program (NVBDCP) [6], 52 Virus Research and Diagnostic Laboratories (VRDL) were created by the Department of Health Research [8] and the Integrated Disease Surveillance Program (IDSP) [7]. High prevalence of dengue fever and regular outbreaks put a severe strain on the nation's health services and economy. The primary methods for prevention and control in India include vector control, case management, and case identification, prevention of the dengue virus's spread [6]. Several vaccinations are being developed, and a new dengue vaccine is currently under Research. In light of this, we To determine the dengue fever disease burden in India, a systematic review and meta-analysis were carried out. We also looked at the dengue virus's serotype distribution in projected case fatality rates, circulation, and the percentage of subsequent infections.

ETIOPATHOGENESIS:
DF is a severe flu-like infection that involves individuals of all age groups (infants, children, adolescents, and adults).[9] Transmission among human beings occurs by the mosquito Aedes aegypti and chiefly occurs during the rainy season.[10] The proposed Etiology for dengue virus infection are: Viral replication, primarily in macrophages[11] Direct skin infection by the virus[12] Immunological and chemical-mediated mechanism induced by host–viral interaction.[12] According to the 1997 classification, dengue can be divided into undifferentiated fever, DF, and DHF.[18]

DHF was further subdivided into grades I–IV.
Grade I: Only minimal bleeding or a successful tourniquet test
Grade II: Spontaneous bleeding under the skin and in other places
Grade III: Clinical sign of shock
Grade IV: Severe shock - feeble pulse, and blood pressure cannot be recorded.[19]

Here, grades III and IV comprise DSS,[17]
CLINICAL MANIFESTATIONS

Individuated fever Although it can sometimes happen after the initial secondary infection, this stage is primarily observed in the original illness. Clinically, it is challenging to distinguish from a variety of other viral illnesses, and it frequently goes undetected.

Dengue fever
DF most commonly affects adults and older children, and it accompanies both primary and secondary infections. Onset of symptoms is characterized by a biphasic, high-grade fever lasting for 3 days to 1 week.[20,21] Severe headache (mainly retrobulbar), lassitude, myalgia and painful joint, metallic taste, appetite loss, diarrhoea, vomit, and stomach pain are the other common manifestations. Dengue is also known as breakbone fever because of the associated myalgia and pain in joints.[16,22] Of patients with DF, 50–82% report with a peculiar cutaneous rash.[23,24] The first rash, which usually appears before or during the first 1-2 days of fever, is caused by capillary dilation and manifests as a brief facial flushing erythema. Three days to a week after the fever, the second rash appears as an asymptomatic maculopapular or morbilliform eruption. Individual lesions may occasionally combine to form broad, confluent erythematous patches with isolated bleeding spots and spherical islands of sparing, resembling "white islands in a sea of red."[26–25] Pruritis is only documented in 16–27% of cases, and the skin rash is typically asymptomatic.[9,26] While significant menstruation, petechiae/purpura, gingival and epistaxis bleeding, and gastrointestinal tract (GIT) hemorrhage can all happen, bleeding episodes are uncommon in DF patients.20

Dengue hemorrhagic fever
DHF is commonly observed in cases of recurrent dengue fever. However, because of mother-acquired dengue antibodies, it can also happen to infants during a primary illness. Among the suggested DHF diagnostic criteria are: a. Clinical specifications

Acute-onset febrile phase – high-grade fever lasting from 2 days to 1 week. Hemorrhagic episodes (at least one of the following forms): Petechiae, purpura, ecchymosis, epistaxis, gingival and mucosal bleeding, GIT or injection site, hematemesis and/or melanoma. b. Laboratory parameters: Thrombocytopenia (platelet count <100,000/cu mm) The hemorrhagic episodes in DHF are associated with multifactorial pathogenesis,

deficiency and dysfunction of platelet sand defects in the blood coagulation pathways are the attributed factors.Decreased production of platelets and increased destruction of platelets may result in thrombocytopenia in DHF. The impaired platelet function causes the blood vessels to become fragile and this results in hemorrhage. The clinical course of DHF is characterized by three phases: Febrele, leakage, and convalescent phase. High-grade fever of acute onset along with constitutional signs and facial erythema characterizes the commencement of the febrile illness.[21] The initial febrile illness is marked by a morbilliform rash and hemorrhagic tendencies. The fever persists for 2 days to 1 week and then drops to normal or subnormal levels when the patient either convalesces or advances to the plasma leakage phase. High plasma escape cases are marked by frank shock with low pulse pressure, cyanosis, hepatomegaly, pleural and pericardial effusions, and ascites. Severe ecchymosis and gastrointestinal bleeding followed by epistaxis may also be noted in a few cases. Bradycardia, confluent petechial rashes, erythema, and pallor are seen during this phase.

Dengue shock syndrome
DSS is defined as DHF accompanied by an unstable pulse, narrow pulse pressure (<20 mmHg), restlessness, cold, clammy skin, and circumoral cyanosis. Progressively worsening shock, multiorgan damage, and disseminated intravascular coagulation account for a high mortality rate associated with DSS. The shock persists for a short span of time and the patient promptly recovers with supportive therapy.
OROFACIAL FEATURES

Oral features are infrequently seen in dengue virus infection and are more commonly associated with DHF. Erythema, crusting of lips, and tongue and soft palatal vesicles constitute the prominent oral features in dengue virus infection. Chadwick et al. [26] reported higher cases involving the mucosa with scleral injection (90%), whereas Sanford noticed vesicular eruptions of the soft palate (>50%). reported numerous hemorrhagic bullae on the sublingual mucous membrane, lateral surface of the tongue, and floor of the mouth. Brown-colored plaquelike lesions with a rough surface were seen on the buccal mucosa that showed bleeding on touch along with spontaneous bleeding from the gingiva and the tongue. Petechiae, purpura, ecchymoses, and nasal bleeding have also been reported.[40] Mitra et al. reported bleeding gums, hemorrhagic plaques, and inflamed tonsils in a dengue-infected patient. Isolated hypoglossal nerve palsy following dengue infection is a rare occurrence. Taste alteration, conjunctival redness, and lymphadenopathy may also be reported in DF3.

DIAGNOSIS

Cautious attention should be directed at DF if a patient suffers from high fever within 2 weeks of being in the tropics or subtropics. A decreased number of white blood cells (leukopenia), accompanied by a decreased number of platelet count (thrombocytopenia) and metabolic acidosis are the initial changes on laboratory examinations. Microbiological laboratory testing confirms the diagnosis of DF. Virus segregation in cellcultures, nucleic acid demonstration by polymerase chain reaction (PCR), and serological detection of viral antigens (such as NS1) or particular antibodies are the preferred microbiological assays.[5] Viral segregation and nucleic acid demonstration provide precise diagnosis, although the high cost limits the availability of these tests.

DIFFERENTIAL DIAGNOSIS

Broad differential diagnosis is considered in a patient presenting with fever and a rash similar to that seen in DF.

MANAGEMENT OF DENGUE INFECTION

Fluid replacement and antipyretic therapy with paracetamol is the preferred therapy following the febrile phase. Care should be taken not to use other nonsteroidal antiinflammatory drugs. Judicious fluid administration forms the mainstay of treatment during the critical phase of the infection. Normal saline, Ringer’s Lactate, and 5% glucose diluted 1:2 or 1:1 in normal saline, plasma, plasma substitutes, or 5% albumin are the routinely administered fluids. WHO guidelines summarize the following principles of fluid therapy:

• Oral fluid supplementation must be as plentiful as possible. However, intravenous fluid administration is mandatory in cases of shock, severe vomiting, and prostration (cases where the patient is unable to take fluids orally)
• Crystalloids form the first-line choice of intravenous fluid (0.9% saline)
• Hypotensive states that are unresponsive to boluses of intravenous crystalloids, colloids (e.g., dextran) form the second-line measures
• If the patient remains in the critical phase with low platelet counts, there should be a serious concern for bleeding. Suspected cases of bleeding are best managed by transfusion of fresh whole blood.

CONCLUSION

Dengue has evolved as a global life-threatening public health concern, affecting around 2.5 billion individuals in more than 100 countries. The physician should be aware about the varied clinical manifestations of this condition and ensure an early and adequate treatment plan. Future directions to combat this dreadful disease aim at methods of mosquito control, development of vaccine, and antiviral drug regimen.

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REFERENCES: