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Advisory for the Prevention and Control of Dengue Fever

Purpose: Keeping in view the seasonal trends of Dengue Fever, it is imperative to work on prevention, while staying vigilant for detection of cases and ensuring preparedness to launch response activities for curtailing the spring peak of dengue transmission. This is more important as we are heavily dealing with the COVID-19 scenario and we may not neglect other infectious diseases. This advisory therefore, intended to facilitate the healthcare authorities and professional effectively dealing the potential challenge during the next few months.

Background: Dengue is a viral disease transmitted by mosquitoes of the genus *Aedes (Aedes aegypti* & *Aedes albopictus),* which are widely distributed in subtropical and tropical areas of the world including Pakistan. The disease affects approximately 50-100 million people every year of which about 1% develop serious complications such as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS); leading to about 22,000 deaths. Dengue Vector Surveillance, integrated vector management, early identification and good clinical management may however, reduce the case fatality to <1%.

Dengue is caused by any one of four subtypes of dengue viruses (DENV-1, DENV-2, DENV-3, or DENV-4). Infection with one serotype confers lifelong homotypic immunity against that serotype and a very brief period of partial heterotypic immunity to other serotypes, but a person can eventually be infected by multiple serotypes. The incubation period ranges from 3 to 14 days (commonly 4-7 days).

Dengue Fever is endemic in almost all geographical regions of Pakistan and there are substantial evidences that its multiple serotypes are circulating in the different areas of the country. Despite surveillance challenges, more than 54,000 cases with 95 deaths of Dengue Fever were reported in Pakistan during 2019.

Clinical Presentation: Dengue has a wide range of clinical spectrum. Initial dengue infection may be asymptomatic (50-90%), may result in a non-specific febrile illness, or may produce the symptom complex of classic dengue fever (DF). Classic dengue fever is marked by rapid onset of high fever, headache, retro-orbital pain, diffuse body pain (both muscle and bone), weakness, vomiting, sore throat, altered taste sensation, and a centrifugal maculo-papular rash. The severity of the pain leads to the term break-bone fever.

Sequential infections with different serotypes increase the risk for dengue haemorrhagic fever and dengue shock syndrome. Warning signs include severe abdominal pain, persistent vomiting, marked change in temperature (from fever to hypothermia), haemorrhagic manifestations, change in mental status (irritability, confusion or obtundation) and thrombocytopenia (platelet count of <100,000/mm^3). Early signs of shock include restlessness, cold clammy skin, rapid weak pulse and narrowing of the pulse pressure (systolic and diastolic blood pressure). Patients with dengue fever should be advised to return to the hospital if they develop any of these signs.

Laboratory Diagnosis: Collect 3-5 ml venous blood/ serum. Label and pack it properly in triple packing and transport maintaining cold chain, to the lab along-with complete history form. Transport the sample to the provincial public health labs for dengue ELISA and PCR testing (if available) or send to the Virology Department of Public Health Laboratories Division at the National Institute of Health, Islamabad. Time period for test is critical and mentioned below:

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a. Dengue NS1 antigen can be detected in the serum as early as 1 Day Post Onset (DPO) of symptoms and up to 18 DPO.
b. Serological detection by IgM ELISA after 5 days of the onset of illness.
c. Molecular detection using Real-time PCR test within one week after onset of illness
d. IgG is detectable at low titer at the end of the first week of illness and slowly increases. In contrast, during a secondary infection, antibody titers rise extremely rapidly. High levels of IgG are detectable even in the acute phase and they rise dramatically over the preceding two weeks.

Treatment/ Clinical Management:

- The key is early recognition and understanding of the clinical problems during the different phases of the disease, leading to a rational approach to case management and a good clinical outcome. Case management at the primary and secondary care levels (where patients are first seen and evaluated) are critical in determining the clinical outcome of dengue. A well-managed front-line response reduces hospital admissions and also saves lives.
- It is typically a self-limiting disease with a mortality rate of less than 1%.
- When treated, dengue hemorrhagic fever has a mortality rate of 2-5%, but when left untreated, the mortality rate may approach up-to 50%.
- During an established outbreak and in high endemic areas, the clinical management of suspected cases must be initiated without waiting for laboratory results.
- No specific antiviral agents exist for dengue and mainly relies on the management of symptoms. Supportive treatment must be undertaken as required for the specific disease manifestations. Fever and myalgia should be managed with acetaminophen. *Aspirin or nonsteroidal anti-inflammatory agents should generally be avoided because of the risk of bleeding complications and the potential risk of Reye's syndrome in children.*
- Patients with dengue fever should be cautioned to maintain their intake of oral fluid to avoid dehydration.
- The most important measure to assist the patient with dengue fever is to carefully evaluate them for impending complications, such as early evidence of DHF.
- Severe dengue is a medical emergency and requires immediate hospitalization, close observation and frequent monitoring in an intensive care unit may be required.
- Administration of corticosteroids has no demonstrated benefit and is potentially harmful to patients
- Platelet transfusions are not effective for preventing or controlling hemorrhage, but may be warranted in severe thrombocytopenia (<10,000/mm3) and active bleeding.
- Prophylactic platelet transfusions in patients with severe thrombocytopenia without active bleeding are generally not recommended.
- Patients with significant bleeding may require blood transfusion.
- HCT should always be interpreted together with vital signs and hemodynamic state. Hematocrit measurements must be interpreted with caution critically assessing the adequacy of fluid repletion. IV fluid therapy with crystalloids or colloids will decrease HCT levels; the decrease in HCT will be more pronounced and sustained with colloid therapy.
- Careful clinical detection and management of dengue patients can significantly reduce mortality rates from severe dengue.

Case Definition:

Clinically compatible case of Dengue like illness: Any person with acute febrile illness of > 2 days and <10 days with two or more manifestations from severe headache, myalgia/ arthralgia, retro-bulbar pain, severe muscular pain, severe backache or joint pain, platelets <150,000 and hemorrhagic signs.

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Suspected Case: A clinically compatible case of dengue-like illness, dengue, or severe dengue with an epidemiologic linkage:

- Travel to a dengue endemic areas or presence at area where outbreak of dengue was ongoing since last 2 two weeks.
- Association in time and place with a confirmed or probable dengue case.

Probable Case: A clinically compatible case of dengue-like illness, dengue, or severe dengue with laboratory results indicative of probable infection.

Confirmed case: Suspected/ Probable case confirmed by lab tests.

Prevention: At present, the main method to prevent the transmission of dengue virus is through Integrated Vector Management with following interventions:

- preventing mosquitoes from accessing egg-laying habitats by environmental management and modification;
- disposing of solid waste properly and removing artificial man-made habitats;
- covering, emptying and cleaning of domestic water storage containers on a weekly basis;
- applying appropriate insecticides to water storage(non-potable) outdoor containers;
- using of personal household protection measures, such as window screens, long-sleeved clothes, repellents, insecticide treated materials, coils and vaporizers
- improving community participation and mobilization for sustained vector control;
- applying insecticides as space spraying during outbreaks as one of the emergency vector-control measures; and
- active monitoring and surveillance of vectors be carried out to determine effectiveness of control interventions.

Surveillance for human infections: Suspected case(s) or clustering of Dengue fever as per above case definitions must be evaluated through laboratory and field investigations. All the districts health officials and other stakeholders may please be informed and recommended to initiate action accordingly. The Field Epidemiology and Disease Surveillance Division (FE&DSD), NIH may be contacted for technical assistance on Tel: 051-9255237 and Fax No. 051-9255575.

Note:

- All health and laboratory personnel should ensure strict adherence to the Standard Precautions for handling any suspected DF/ DHF cases and samples.
- The National Guidelines on VHFs, including Dengue Hemorrhagic Fevers and IEC material are available at the NIH website **www.nih.org.pk**.
- Prepare a line-list for all the suspected cases with information (demographic, clinical & risk factor) and share with DSRU at regional/ provincial DGHS Office and NIH.

The above 'Advisory' may please be circulated widely to all concerned.

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Executive Director
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