F.1-22/Adv/FEDSD/2017

National Institute of Health

(Field Epidemiology & Disease Surveillance Division)

Ph: (92-051) 9255237 Fax: (92-051) 9255575

WHO Collaborating Centre for Research and Training in Viral Diagnostics

24th August 2017

Subject: **Advisory for the Prevention and Control of Dengue Fever Outbreak in Khyber Pakhtunkhwa**

Background: Dengue is the most common arthropod-borne viral (arboviral) illness in humans. Dengue is transmitted by female mosquitoes of the genus *Aedes (Aedes aegypti* & *Aedes albopictus),* which are widely distributed in subtropical and tropical areas of the world. Dengue viruses have four subtypes (DENV-1, DENV-2, DENV-3, or DENV-4). Dengue has emerged as a worldwide problem only since 1950s. Detected first during 1994; the dengue fever has now become endemic in almost all geographical regions of Pakistan and there is a substantial evidence that multiple serotypes of dengue virus are circulating in the different areas of Pakistan.

Globally, around 50-100 million people are infected yearly out of which about 1% develop serious complications such as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) leading to about 22,000 deaths. Good clinical management may reduce the case fatality of DF to <1% and DHF up to 2-5%. A small percentage of persons who have previously been infected by one dengue serotype develop bleeding following infection with another dengue serotype. This syndrome is termed dengue hemorrhagic fever.

A published study in virology Journal in 2016 indicates that all four dengue virus serotypes were circulating in Punjab Province with highest frequency of DENV-2 (41.64%) and DENV-3 (41.05 %) while, DENV-2 (40%) and DENV-3 (60%) were also detected in Swat District. Moreover, 3.8% people earlier infected with one serotype and again infected with other serotype of dengue virus got Dengue Hemorrhagic Fever (DHF) which may account for the high mortality and morbidity rates as compared to previous outbreaks.

Current DF Situation in Khyber Pakhtunkhwa:
Till date, from Khyber Pakhtunkhwa, a total of 738 dengue fever cases have been reported following the standard case definition along with 5 deaths. Out of total cases, 706 cases were reported from Peshawar while other cases were from Manshera (19), Mardan (5), Haripur (5) and Abbottabad (3). It is imperative to be vigilant about the dengue fever outbreak situation and take preventive measures to limit further transmission.

Objective: The objective of this advisory is to sensitize health care authorities to further strengthen and improve the level of preparedness in prevention and control of dengue fever.

Incubation period: After the bite of an infected female *Aedes* mosquito, onset of illness is usually between 3 to 14 days (commonly 4-7 days).

Clinical presentation: Initial dengue infection may be asymptomatic (50-90%), may result in a nonspecific febrile illness, or may produce the symptom complex of classic dengue fever (DF).

Classic DF 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 maculopapular rash, among other manifestations. The severity of the pain leads to the term break-bone fever to describe dengue.

Sequential infections with different serotypes increase the risk for DHF and DSS. Warning signs includes 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 DF should be advised to return to the hospital if they develop any of these signs.

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.

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

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 may be confirmed by lab tests

Criteria for 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.

Preventive Measures:

- Community survey to determine density of vector mosquitoes (*Aedes aegypti* & *Aedes albopictus*).
- Identify and destroy mosquito larval habitats. *Aedes aegypti* is a domestic mosquito that breed in mainly man-made artificial containers in and around human dwellings. Among these, the most preferred breeding sites are drums, traditional water tanks and house hold utensils, tyres and other discarded containers that hold fresh water may be come infested.
- Proper solid waste disposal and removing whatever water collection from containers called source reduction or environmental management should be a primary consideration in mosquito control to prevent access by egg-laying female mosquitoes.
- Larviciding is recommended for large water storages (>100 lit). Recommended larvicide is temephos. Strictly follow the dose criteria of manufactures, particularly when use for drinking water.
- Thermal fogging is recommended in case of emergency, epidemic and high vector density. Space spraying must be conducted at the time of peak activity (dawn and dusk) of adult Aedes mosquitoes.
- Indoor Residual Spray (IRS) is generally not highly recommended intervention during outbreak of dengue. However it should mainly focus on schools, public meeting places and offices during outbreak.

- Peri-focal residual spray is recommended to control dengue vector. All walls of the potential containers where evidence of breeding of Aedes mosquitoes is recorded should be covered praying outer and inner side as well as other objects up to 60cm from the container.
- It is important that sewage water is not a breeding site for dengue vector
- Conduct community mobilization through lady health workers, schools, local government and religious leaders, to promote:
  - Protection against day biting mosquitoes including use of screening, protective clothing and repellents.
  - Promotion of school-based community awareness programmes targeting children and parents for improved water storage practice to control vector breeding at home.
  - Community should also be trained using mass media and community volunteers.

Treatment/ Clinical Management:

- There is no specific treatment for disease and mainly relies on the symptomatic management. However, it is important for the attending physicians to exclude other treatable diagnoses.
- Neither any vaccine nor any anti-viral are recommended for prevention and treatment.
- During an established outbreak and in high endemic areas, the clinical management of suspected cases must be initiated without waiting for laboratory results.

Febrile Phase: In the early febrile phase, it is not possible to distinguish DF from DHF. The treatment during febrile phase is symptomatic and largely supportive, as follows:

- Rest and give extra amounts of fluids
- Paracetamol 10 mg/kg/dose in children and 500-1,000 mg/dose in adult. Maximum adult dose is 4 grams/day
- Do not give Aspirin or other NSAID like Ibuprofen.
- Oral rehydration therapy (ORT/ ORS) is recommended in moderate dehydration
- Complete blood count (CBC/CP) with follow up is an important tool in management of suspected dengue patients
- All dengue patients must be carefully observed for signs of shock for at least 24 hours after recovery from fever.
- The patient who does not have any evidence of circulatory disturbance and who has been afebrile for > 24 hours does not need further observation and may be discharged.

<u>Protocol for Management according to Phases of DHF</u>

(1) Dengue Hemorrhagic Fever (DHF) Grades I and II.

- During the afebrile phase of DHF grades I and II, the patient has same symptoms as during the febrile phase. The clinical signs plus thrombocytopenia and hemo-concentration or rise in hematocrit are sufficient to establish a clinical diagnosis of DHF.
- During this situation hospitalize the patient and treat accordingly.

(2) DHF Grades III and IV (DSS):

- Common manifestations observed during febrile phase of DHF Grade III are circulatory failure manifested by rapid and weak pulse, narrowing of the pulse pressure characterized by high diastolic pressure relative to systolic pressure, e.g. 90/80 mm Hg (this is usually due to plasma leakage) or hypotension (possibly due to bleeding), and the presence of cold clammy skin and restlessness or lethargy.
- Immediately shift the patient to Intensive Care Unit and treat accordingly.

Note:

- Platelet transfusions are not effective for preventing or controlling hemorrhage, but may be warranted in severe thrombocytopenia (<10,000/mm^3) 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. However, subsequent hematocrit measurements must be interpreted with caution, critically assessing the adequacy of fluid repletion.
- Careful clinical detection and management of dengue patients can significantly reduce mortality rates from severe dengue.

Laboratory Diagnosis: Collect 3-5 ml venous blood/ serum of any suspected patient in sterile venoject tubes. Tight and seal it with full biosafety precautions. Label and pack it properly in triple packing with ice packs and transport to lab along-with complete history form. Transport the sample to the provincial labs for dengue ELISA, PCR testing and NS1 (if available) or send to Virology Department of PHLD at the National Institute of Health, Islamabad. Time period for test is critical and mentioned below:

- Dengue NS1 antigen can be detected in the serum as early as 1 Day Post Onset (DPO) of symptoms and up to 18 DPO.
- Serological detection by IgM ELISA after 5 days of the onset of illness.
- Molecular detection using Real-time PCR test within one week after onset of illness. The facility is available at NIH Islamabad.
- 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.

Kindly evaluate the suspected case(s) or clustering of dengue fever as per case definition. This communication may please also be distributed to the districts health officials and other stakeholders for information and action. Prepare a line-list including demographic, clinical and epidemiological information for all the suspected cases and share with Disease Surveillance and Response Unit at provincial DGHS Office and NIH. 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. The National Guidelines on VHFs, including Dengue Hemorrhagic Fevers are available at the NIH website www.nih.org.pk.

Brig. Dr Aamer Ikram, SI(M)
Executive Director