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Advisory for the Prevention and Control of Diphtheria

Background:
Diphtheria is vaccine-preventable upper-respiratory infection that usually affects the mucous membranes of the nose and throat. The disease is caused by the toxins produced by *Corynebacterium diphtheriae (C. diphtheriae)* or by *Corynebacterium ulcerans (C. ulcerans).* Humans are the only reservoir of the disease and transmit the infection from one person to another through respiratory droplets particularly by coughing or sneezing or rarely with contaminated clothes and surfaces. Diphtheria occurs worldwide, particularly in countries with suboptimal vaccination coverage. In Pakistan, sporadic cases of Diphtheria continue to be reported throughout the year and frequently during winter and spring. Diphtheria has been notified as a priority/reportable disease in Pakistan. Despite the availability of a safe and effective vaccine, outbreaks have been occurring with more often among partially or non-vaccinated population. People living in overcrowded, unhygienic conditions, malnutrition also pose a risk of increased disease burden. Enhancing routine immunization coverage and implementing infection prevention and control measures at hospital and community level can significantly limit the potential and scale of the disease transmission.

Objectives of the Advisory: This Advisory is intended to alert the health professionals to remain vigilant and detect suspected Diphtheria cases and to undertake prevention and control measures during the winter season.

Clinical Presentation: The presentation of Diphtheria ranges from asymptomatic carriers to life threatening respiratory illness. After a usually short incubation period (2–5 days to 10 days max,), the release of the cytotoxin may produce characteristic lesions on the affected mucous membranes of upper respiratory tract causing respiratory Diphtheria or affecting skin causing Cutaneous diphtheria (rare). The most visible and common symptom of diphtheria is a thick, gray-whitish coating also called as pseudo-membrane that appears within 2–3 days of illness onset on the nasal mucosa, throat and tonsils and is the hallmark of respiratory diphtheria. Usually, diphtheria has a gradual onset and is characterized by a mild fever, sore throat and difficulty swallowing, malaise, loss of appetite, and/or hoarseness. On inspection, the patient may also have an obviously swollen neck, referred to as "bull neck" due to swollen cervical lymph nodes, soft tissue edema and mucosal edema. The case-fatality ratio is 5%–10% which may turn up to 100% among unvaccinated if not treated appropriately. Diphtheria toxins may also get into the blood stream causing complications that may include myocarditis, polyneuropathy, and renal failure and bleeding problems due to low blood platelets.

Sample Collection and Transportation: Nasopharyngeal swab for culture or for PCR should only be obtained using sterile polyester, rayon or nylon flocked swabs. Amies-Transport medium with charcoal is generally used as the transport medium. Specimens should be transported to the laboratory at 2–8 °C within 24–48 hours of collection.

Laboratory Confirmation: PCR is a rapid test with higher sensitivity while culture is considered the gold standard laboratory test for Diphtheria.

Clinical Management: Isolate the patient in single room. In addition to standard precautions, droplet and contact precautions for respiratory and cutaneous diphtheria respectively. Diphtheria Antitoxin

(DAT) is highly effective and the gold standard for treatment of diphtheria, should be administered immediately to probable cases with respiratory diphtheria based on clinical diagnosis. Antibiotics can be prescribed oral or intravenous based on the clinical condition of the patient and culture report. Recommended antibiotics are azithromycin, clarithromycin, and erythromycin and penicillin. Trimethoprim-sulfamethoxazole can also be used and patients after completing 48 hours of effective antibiotic therapy are usually non-contagious to diphtheria. Asymptomatic carriers with toxigenic strain should be subjected to the same isolation and treatment measures as the index case. It is important to initiate prophylactic therapy in contacts who have not been immunized, before the results of culture are received. The disease is usually not contagious 48 hours after antibiotics are instituted.

Diphtheria antitoxin (DAT) stockpiles: The potential size of a stockpile needs careful consideration since treatment of diphtheria cases is also dependent on diagnostic capacity and the provision of health-care services. As DAT is included in the WHO Model List of Essential Medicines for Children, DRAP must ensure the minimum required stockpiles.

Case Definition for surveillance:

Suspected/Probable case: An upper respiratory tract illness with an adherent membrane of the tonsils or larynx, pharynx and/or nose and laryngitis, pharyngitis or tonsillitis.

Confirmed case: Detection of *Corynebacterium* spp. isolated by culture is laboratory confirmed case.

Epidemiologically linked cases: An epidemiologically linked case meets the definition of a suspected case and is linked epidemiologically to a laboratory-confirmed case. In this situation, a person has had intimate respiratory or physical contact with a laboratory-confirmed case within the 14 days prior to onset of sore throat.

Outbreak response: A single laboratory-confirmed case should trigger a public health response. Two epidemiologically linked cases, of which at least one is laboratory confirmed, is considered an outbreak. All outbreaks should be investigated immediately and case-based data should be collected.

Prevention and Control Measures: Vaccination consists of DPT 3 doses of 0.5 ml each/IM administered to the children less than one year of age as per mentioned schedule: 1st dose at age six weeks; 2nd dose at age ten weeks; 3rd dose at age fourteen weeks. **DPT** (also **DTP** and **DTwP**) refers to a class of combination vaccines against three infectious diseases i.e. Diphtheria, Pertussis (whooping cough), and tetanus. However, following infection prevention and control measures are recommended to prevent further transmission of diphtheria:

- Frequent and thorough hand washing with soap and water and use of hand sanitizer if soap and water are unavailable.
- Apply standard precautions (droplet and contact) in patient settings and at community level.
- Awareness to exercise respiratory etiquettes through covering mouth and nose while sneezing or coughing with elbow must be ensured.
- Suspected cases should avoid contact with young children and women in late pregnancy, especially the unimmunized, until at least 02 days of antibiotics are taken.

This advisory may please be widely distributed among all concerned.

Dr. Muhammad Salman
Chief Executive Officer
NIH, Islamabad

Distribution overleaf

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