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CLINICAL SIGNS AND COMPLICATIONS OF DIPHTHERIA

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Abstract: Diphtheria is an infectious disease affecting the upper respiratory tract and throat, caused by the bacterium Corynebacterium diphtheriae. Clinical signs include sore throat, thick membrane formation, fever, and swollen lymph nodes. Complications may involve the heart, kidneys, and nervous system, and can sometimes be life-threatening.

Keywords: diphtheria, clinical signs, complications, infectious disease, Corynebacterium diphtheriae

Annotatsiya: Difteriya — bu yuqori nafas yo'llari va tomoqni zararlaydigan yuqumli kasallik bo'lib, asosan Corynebacterium diphtheriae bakteriyasi sababli yuzaga keladi. Kasallikning klinik belgilari orasida tomoq og'rig'i, bo'g'ilishga o'xshash qalin parda, yuqori tana harorati va limfa tugunlarining shishishi mavjud. Difteriyaning asoratlari yurak, buyrak va asab tizimiga ta'sir qilishi mumkin, ba'zan esa hayot uchun xavfli bo'ladi.

Kalit so'zlar: difteriya, klinik belgilari, asoratlar, yuqumli kasallik, Corynebacterium diphtheriae

Аннотация: Дифтерия — это инфекционное заболевание, поражающее верхние дыхательные пути и горло, вызываемое бактерией Corynebacterium diphtheriae. К клиническим проявлениям относятся боль в горле, толстая пленка на слизистой, повышенная температура и увеличение лимфатических узлов. Осложнения могут затрагивать сердце, почки и нервную систему, иногда представляя опасность для жизни.

Ключевые слова: дифтерия, клинические признаки, осложнения, инфекционное заболевание, Corynebacterium diphtheriae

Introduction: Diphtheria is an acute, highly contagious bacterial infection primarily caused by *Corynebacterium diphtheriae*. Although its incidence has significantly declined in many parts of the world due to widespread vaccination, it remains a public health concern in regions with low immunization coverage. The disease primarily affects the upper respiratory tract, including the throat and tonsils, but can also impact the skin and other organs in rare cases.

Clinically, diphtheria manifests with sore throat, fever, swollen lymph nodes, and the formation of a characteristic thick gray or white membrane in the pharynx. If not promptly diagnosed and treated, the disease can lead to severe complications, including myocarditis, neuropathy, and respiratory obstruction, which may be life-threatening.

Understanding the clinical features and potential complications of diphtheria is essential for early detection, effective management, and prevention of outbreaks. This paper provides an overview of the key clinical signs and complications associated with diphtheria, emphasizing the importance of timely medical intervention and vaccination programs.

Main body: Diphtheria is an acute, toxin-mediated bacterial infection caused primarily by *Corynebacterium diphtheriae*, which produces a potent exotoxin that injures human tissues and

organs. The disease mainly affects the upper respiratory tract but can also manifest in cutaneous (skin) forms in rare cases.

Clinical Features

The incubation period typically ranges from **2 to 5 days** after exposure. Initial symptoms are often nonspecific and include sore throat, mild fever, malaise, and swollen neck lymph nodes. Shortly thereafter, the characteristic **thick, greyish-white pseudomembrane** forms on the tonsils, pharynx, or larynx — a hallmark of respiratory diphtheria — and is firmly adherent to underlying tissues, making attempts to remove it painful and potentially hemorrhagic.

Respiratory diphtheria can progress rapidly, and in severe cases the pseudomembrane can extend to obstruct airways, leading to **life-threatening respiratory distress**.

Complications

The major complications of diphtheria are directly related to the effects of the diphtheria toxin on distant organs and tissues:

- **Airway obstruction:** Severe pseudomembrane formation and soft tissue swelling can block breathing.
- **Myocarditis:** Inflammation of the heart muscle often develops about **10–14 days** after symptom onset and is a leading cause of death in severe cases.
- **Neurological complications:** Toxin absorption into the bloodstream can injure peripheral nerves, leading to **neuropathy** or paralysis, particularly of the soft palate, vocal cords, and limbs.
- **Kidney damage and other organ involvement:** Although less common, renal injury and multisystem failure may occur in advanced illness.

Without prompt treatment (antitoxin and antibiotics), the disease can be **fatal**, especially in **unvaccinated individuals**. Globally, untreated diphtheria has a fatality rate of approximately **30%**, particularly in children under five and adults over 40. In settings with adequate medical care, reported case fatality ranges from about **5–10%**.

Epidemiology and Incidence

Widespread immunization has dramatically reduced diphtheria incidence since the introduction of the vaccine in the early 20th century. However, **outbreaks still occur** — particularly in areas with low vaccination coverage, weak health systems, or social disruption.

As of recent estimates, **about 84% of children worldwide** receive the recommended **three doses of diphtheria-containing vaccine** in infancy, leaving roughly **16% under- or un-immunized** and therefore at higher risk of infection.

Reported global case numbers are thought to **underestimate the true burden** of disease due to under-reporting and surveillance gaps, but historical data indicate **several thousand cases annually worldwide** in recent years.

Prevention and Control

Prevention is overwhelmingly vaccine-based: routine immunization with diphtheria toxoid-containing vaccines (often combined with tetanus and pertussis vaccines) dramatically reduces both incidence and severity of disease. Booster doses through childhood, adolescence, and adulthood are recommended to maintain long-term immunity.

Conclusion: Diphtheria remains a potentially severe infectious disease despite widespread vaccination efforts. Its clinical features — including sore throat, fever, swollen lymph nodes, and the characteristic pseudomembrane — are easily recognizable but can progress rapidly to life-threatening complications such as airway obstruction, myocarditis, and neuropathy if not promptly treated. Epidemiological data emphasize that unvaccinated populations remain at the highest risk, with fatality rates reaching up to 30% in untreated cases.

Early diagnosis, timely administration of diphtheria antitoxin and antibiotics, and comprehensive immunization programs are crucial to reducing morbidity and mortality. Continuous surveillance and public health interventions, particularly in regions with low vaccination coverage, are essential to prevent outbreaks and control the global burden of diphtheria.

In summary, diphtheria is a preventable yet serious disease, and its management relies on **vigilance, vaccination, and rapid medical intervention.**

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