

Diphtheria

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Abstract

Diphtheria is a serious bacterial infection affecting the mucous membranes of the nose and throat of preschool children, caused by the bacterium corynebacterium diphtheria. Sore throat, fever, swollen glands and weakness are the main symptoms of diphtheria. But the hallmark sign is a sheet of thick, gray material covering the back of the throat. Schick test is the test used to identify the diphtheria. Prevention of occurrence of disease is by immunization with DPT vaccination and treatment of the disease is by broad spectrum antibiotics.

Keywords: Bacteria; Corynebacterium Diphtheria; Diphtheria; Immunization; Infection; Preschool Children; Schick Test; Transmission; Vaccines.

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Introduction

Diphtheria is a serious bacterial infection that affects the mucous membranes of the throat and nose. Although it spreads easily from one person to another, diphtheria can be prevented through the use of vaccines. If it's left untreated, diphtheria can cause severe damage to your kidneys, nervous system, and heart. It's fatal in about 3% of cases. Diphtheria is one of the major killer diseases of under- five children, known to be existing even much before Christ was born.

Incidence

Diphtheria Outbreaks, though very rare, still occur worldwide, including in developed nations, such as Germany among non-vaccinated children, and Canada after the breakup of the former Soviet Union in the early 1990s, vaccination rates in its

constituent countries fell so low that there was an explosion of diphtheria cases. In 1991, there were 2,000 cases of diphtheria in the USSR. By 1998, according to red cross estimates, there were as many as 200,000 cases in the commonwealth of independent states, with 5,000 deaths. India witnessed 4,071 cases of diphtheria and 104 deaths in 2014, while among the states, Delhi had the highest number of cases at 1,418 and also the highest number of deaths at 60. After a break of one year, diphtheria cases have been reported in Kerala's Malappuram district again. Two diphtheria deaths were reported, taking the total confirmed cases this year to five. In 2013, the district reported 11 cases, with one death, but last year there were no reports of any diphtheria cases.

Definition

Diphtheria is a serious bacterial infection caused by Corynebacterium diphtheria that affects the mucous membranes of the throat and nose.

Risk Factors for Diphtheria

- Improper intake of vaccinations.
- Travelling to a country that doesn't provide immunizations.
- Immune system disorders, such as AIDS.

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- Live in unclean or crowded conditions.

Epidemiology of Diphtheria

Agent Factors

- A type of bacteria named *Corynebacterium diphtheria* causes diphtheria.
- Reservoir of infection: man

Host Factors

Age: Particularly effecting children aged 1 to 5.

Sex: Both sexes are affected.

Immunity: Active immunity through in apparent Infections.

Environmental Factors

Cases occurs in all seasons, although winter season favour the spread of infection

Mode of Transmission

- Droplet infection.
- By direct contact.
- Indirect transmission like contaminated fomites used by the patients.
- Transmission through animal milk.

Portal of Entry

- Respiratory route
- Non respiratory routes such as through skin cut, wounds and ulcers.

Incubation Period

2 to 6 days, occasionally longer.

Symptoms of Diphtheria

Signs of diphtheria often appear within two to five days after the infection occurs. Some people don't experience any symptoms, while others have mild symptoms that are similar to those of the common cold. The most visible and common symptom of diphtheria is a thick, gray coating on the throat and tonsils.

Symptoms According to the Types of Diphtheria

1. Pharyngotonsillar Diphtheria

- Sore throat

- Difficulty in swallowing
- Low fever
- Mild erythema on the throat

2. Laryngoatracheal Diphtheria

- Fever
- Hoarseness
- Croupy cough
- Dyspnoea
- Parenchymatous degeneration
- Fatty infiltration
- Necrosis of the heart muscles, liver, kidneys & adrenals.
- Paralysis of the soft palate, eye muscles, or extremities.

3. Nasal Diphtheria

- Mild form of respiratory diphtheria
- Localized to the septum or turbinate of one side of the nose.

4. Cutaneous Diphtheria

- Common in tropical area.
- Secondary infection of previous skin abrasions or infections.
- Ulcer surrounded by erythema and covered with a membrane.

Other Common Symptoms Include

- Fever.
- Chills.
- Swollen glands in the neck.
- Loud, barking cough.
- Sore throat.
- Bluish skin.
- Drooling.
- General feeling of uneasiness or discomfort.

Additional Symptoms may Occur as the Infection Progresses, Including

- Difficulty breathing or swallowing
- Changes in vision

- Slurred speech
- Signs of shock, such as pale and cold skin, sweating, and a rapid heartbeat.

Diagnosis of Diphtheria

- History about symptoms.
- Physical examination for swollen lymph nodes, a gray coating on the throat or tonsils.
- Schick test

It is intradermal test for testing the antitoxin, information regarding immunity status, & state of hypersensitivity to diphtheria toxins and other proteins of the diphtheria cells.

Throat culture may also be taken for identifying the bacteria.

Treatment of Diphtheria

Diphtheria is a serious condition; it will want to treat quickly and aggressively.

- Isolation of the patient till 2 to 3 throat swab culture reports are negative consecutively, which will takes about 15 -20 days.
- Absolute bed rest.
- Concurrent disinfection of throat secretions, sputum utensils, clothes, is a must by using 10 % cresol.
- Administration of anti diphtheria serum
- Antibiotics treatment with crystalline penicillin or erythromycin
- Analgesics & antipyretics.
- Maintenance of fluid electrolyte balance.

Prevention of Diphtheria

- Elimination of reservoirs.
- Breaking the channels of communication.
- Protection of susceptible in the community

Immunization

A. Active Immunization

Vaccines used for active immunization include,

a) Vaccines of Single Antigen.

- Plain vaccine.
- Adsorbed vaccines.

b) Vaccines of Multiple Antigens [Combined vaccines].

- Bivalent vaccines [Td and DT].
- Trivalent vaccines [DPT]
- Quadruple vaccines [DPT +IPV].
- Easy four vaccines [DPT+ Hib].
- Easy five vaccines [DPT+Hib+HBsAg].
- Hexavalent vaccines.

B. Passive Immunization

This is done with antidiphtheritic serum [ADS].

Complications of Diphtheria

- Respiratory failure
- Myocarditis
- Neurological complications
- Paralysis of diaphragm
- Bladder problems
- Bleeding problems
- Kidney failure

Conclusion

Diphtheria is an infection caused by the bacterium *Corynebacterium diphtheria*. Signs and symptoms may vary from mild to severe. They usually start two to five days after exposure. Symptoms often come on fairly gradually beginning with a sore throat and fever. In severe cases a grey or white patch develops in the throat. This can block the airway and create a barking cough as in croup. The neck may swell in part due to large lymph nodes. A form of diphtheria that involves the skin, eyes, or genitals also exists. Complications may include myocarditis, inflammation of nerves, kidney problems, and bleeding problems due to low blood platelets. Myocarditis may result in an abnormal heart rate and inflammation of the nerves may result in paralysis.

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