

Diphtheria

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Bio 205 Microbiology

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Diphtheria is an infectious disease of the throat that affects the mucous membrane. It has been documented as far back as Hippocrates' time. It is spread person to person through respiratory droplets. The formation of a tough, gray, mucous membrane blocks the throat. Epidemics of diphtheria were commonly seen beginning in the 16th century.

Diphtheria is caused by *Corynebacterium diphtheriae*. A non-spore forming, club shaped bacterium that is gram positive. It measures several μm long and is between 0.5 and 1 μm in diameter. Irregularly dispersed granules give the bacterium a beaded appearance. Individual cells tend to lay at either acute angles or parallel to each other. There are three recognized strains: *gravis*, *intermedius*, and *mitis*. They grow aerobically. These pleomorphic cells appear different when using assorted media. On a blood agar colonies are small and granular, they appear gray in color with irregular edges. On a chocolate tellurite agar, *gravis* colonies are gray to black with a large, dull, flat appearance; *intermedius* colonies are extremely small and may have a glossy appearance; *mitis* colonies are glossy with a small, dome-shaped appearance.

Diphtheria mainly affects the upper respiratory tract. It grows on mucous membranes and in rare cases within abrasions in the skin. The bacteria release a toxin that interrupts production of polypeptide chain elongation, halting protein synthesis. The dying mucous membrane cells secrete fibrin, which forms a thick, grayish membrane that commonly covers the tonsils, pharynx and larynx. As the toxin is absorbed through the body, it can cause damage to the heart, liver, kidneys, and nervous system. Symptoms begin with a sore throat and fever. There may be swelling of the lymph nodes as well as edema in the neck. Dyspnea due to airway obstruction occurs and may lead to suffocation. Paralysis of the soft palate, eye muscles and extremities may occur from nerve damage. Inflammation of the heart is usually what kills those who do not suffocate first.

Patients are isolated and treatment consists of antimicrobials to kill the bacteria and antitoxins to protect the body from toxic effects. These are injected either intravenously or through an intramuscular shot. Even with proper treatment about 5-10% of patients still die.

Bibliography

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