Editorial

Anthrax Disease

The name comes from anthrax, the Greek word for 'coal', because of the black skin lesions developed by victims with a cutaneous anthrax infection. Robert Koch, a German physician and scientist, first identified the bacteria which caused the anthrax disease in 1875. His pioneering work in the late nineteenth century was one of the first demonstrations that diseases could be caused by microbes. In a groundbreaking series of experiments he uncovered the life cycle and means of transmission of anthrax

What is anthrax?

Anthrax is a life-threatening infectious disease that normally affects animals, especially ruminants (such as goats, cattle, sheep, and horses). Anthrax can be transmitted to humans by contact with infected animals or their products. In recent years, anthrax has received a great deal of attention as it has become clear that the infection can also be spread by a bioterrorist attack or by biological warfare. Anthrax does not spread from person to person. Like many other members of the genus Bacillus, Bacillus anthracis can form dormant end spores (often referred to as "spores" for short, but not to be confused with fungal spores) that are able to survive in harsh conditions for decades or even centuries. When spores are inhaled, ingested, or come into contact with a skin lesion on a host they may reactivate and multiply rapidly. 7Diseased animals can spread anthrax to humans, either by direct contact (e.g. inoculation of infected blood to broken skin) or consumption of a diseased animal's flesh. Until the twentieth century, anthrax infections killed hundreds and thousands of animals and people each year in Australia, Asia, Africa, North America, and Europe, specifically in the concentration camps during WWII. French scientist Louis Pasteur developed the first effective vaccine for anthrax in 1881. The disease is more common in developing countries without widespread veterinary or human public health programs.

Mode of infection

Anthrax can enter the human body through the intestines (ingestion), lungs (inhalation) or skin (cutaneous) and causes distinct clinical symptoms based on its site of entry. However, anthrax does not usually spread from an infected human to a noninfected human.

How long is the incubation period with anthrax?

The incubation period (the period between contact with anthrax and the start of symptoms) like other infectious diseases, the incubation period for anthrax is quite variable and it may be weeks before an infected individual feels sick.

What kinds of diseases does anthrax cause?

There are three forms of disease caused by anthrax: cutaneous (skin) anthrax, inhalation anthrax, and gastrointestinal (bowel) anthrax.

Symptoms of Cutaneous Anthrax: Infection of this type of anthrax in humans is characterized by boil-like skin lesions that start with skin bumps and form ulcers with black, painless patches/eschars.

Symptoms of Gastrointestinal Anthrax: Vomiting of blood, Acute inflammation of the intestinal tract, Severe diarrhea, loss of appetite, collapse of intestinal tract, lesions in intestinal area as well as in mouth and throat. Uneasy feeling due to the toxin excreted by the bacterium.

Symptoms of Pulmonary Anthrax: This type of anthrax shows all the flu-like and common cold symptoms. Within a couple of days, the patient's respiratory system collapses completely.

Diagnosis

Other than Gram Stain of specimens, there are no specific direct identification techniques for identification of Bacillus sp. in clinical material. These organisms are Gram positive but with age can be Gram negative. All Bacillus sp. grow well on 5% Sheep blood agar and other routine culture media. PLET (polymyxin-lysozyme-EDTA-thallous acetate) can be used to isolate B. anthracis from contaminated specimens and bicarbonate agar is used as an identification method to induce capsule formation.

Treatment for Anthrax Disease

Among the three types of anthrax, pulmonary/respiratory anthrax is almost incurable and has almost 100% mortality rate. Once diagnosed with anthrax disease, administer high doses of antibiotics like ciprofloxacin, penicillin etc. Along with antibiotics, the patient may also be treated for the various symptoms such as respiratory system related problems, intestinal tract related problems etc.Vaccination against this disease is also available, but it needs at least a year (during which a person is given 5 doses of vaccine) to make him/her immune to this disease.

Precautions Waste water should be treated with bleach or other anti-microbial agent. Effective decontamination of articles can be accomplished by boiling contaminated articles in water for 30 minutes or longer. Chlorine bleach is ineffective in destroying spores and vegetative cells on surfaces, though formaldehyde is effective. Burning clothing is very effective in destroying spores. Burial does not kill anthrax spores. If a person is suspected as having died from anthrax, every precaution should be taken to avoid skin contact with the potentially contaminated body and fluids exuded through natural body openings.

Prevention

Vaccines: An anthrax vaccine licensed by the U.S. Food and Drug Administration (FDA) and produced from one non-virulent strain of the anthrax bacterium, is manufactured by BioPort Corporation, subsidiary of Emergent BioSolutions. The trade name is BioThrax, although it is commonly called Anthrax Vaccine Adsorbed (AVA). It is administered in a six-dose primary series at 0, 2, 4 weeks and 6, 12, 18 months; annual booster injections are required thereafter to maintain immunity. Unlike NATO countries, the Soviets developed and used a live spore anthrax vaccine, known as the STI vaccine, produced in Tbilisi, Georgia. Its serious side effects restrict use to healthy adults.

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