Anthrax and smallpox

Health & Medicine

One major difference between the pathogens that cause anthrax and smallpox is that anthrax is a form of bacteria while smallpox is an example of a virus, Anthrax is caused by the bacteria Bacillus anthracis.

B. anthracis was the first bacterium which was shown to cause disease by Robert Koch in 1877. B. anthracis has two forms – vegetative and spore state. In its spore state, the bacteria can lay dormant for years. When the spore enters a host, the bacterium reactivates into its vegetative state and then cause disease. It is the spores of the bacterium which is used as a biological weapon.

Smallpox on the other hand caused by the variola virus. Unlike anthrax which is communicated via its spore state, smallpox virus is directly communicated directly from host to host via respiratory droplets or contact with bodily fluids. Smallpox is a biological weapon due to the successful efforts of the WHO to eradicate the disease. With smallpox eliminated, no one has any immunity from the disease and the release of a smallpox sample will have disastrous effects on the population.

Plague is caused by the bacterium Yersinia pestis. Plague is spread to human hosts after being bit by fleas which carry the disease or through contact with infected animals. While causing severe deaths in Europe during the Middle Ages, modern day plague is curable with antibiotics though it can still be lethal when left untreated.

To this day, plague outbreaks are still caused by flea infested rat populations. In rural areas, squirrels and other known flea vectors are known carriers of the plague bacteria.

Anthrax as mentioned spreads as spores which are reactivated once inside a host. Theenvironmentrich in sugars and amino acids triggers the reversal of the spores into an active state. Anthrax can enter the body in three ways – through inahalation, digestion or through entry in small cracks in the skin.

The role of the WHO in preparing for anthrax is that of a think tank. The WHO cannot directly move to prevent the spread of anthrax in countries but it offers valuable aid for the anti-anthrax actions of member countries in the UN. It acts as a well respected adviser on anthrax related issues.

We can think of the WHO as providing a service for the anti-biological weapon efforts of the UN member countries. Some of the services the WHO provides include training activities, disseminating information and providing a number of experts to aid in the identification, diagnosis and treatment of anthrax outbreaks. These services are provided to member countries and medical laboratories worldwide.

The most pressing factor for the spread of plague are rats. Rats carry fleas which are the vectors for the disease. Apart from rats, some contributing factors to plague outbreaks include incidences ofpoverty, war, and civil disturbances. A weak publichealthinfrastructure as well as poor facilities are also contributing factors to the spread of plague into an outbreak.

The best way to manage a plague outbreak is through rapid identification and localization. With rapid treatment and action, the mortality levels of plague can be reduced from 60% to less than 15%. To aid with the quick actions on plague, a rapiddiagnostictest has been developed.

The new test reduces confirmation from 15 days down to 15 minutes. With rapid confirmation, the authorities can more quickly respond to the outbreaks of plague and prevent further contamination of the population.

Bibliography

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