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Smallpox (*Variola*)

IDENTIFICATION

An infectious disease which is serious, contagious and sometimes fatal, caused by the *Variola* virus which emerged in the human population thousands of years ago. There exists no specific treatment for this disease, and the only prevention is vaccination. Smallpox was derived from the Latin word, “spotted” in reference to raised bumps that appear on the face and body of the infected person. There are two different kinds of smallpox: *Variola major and Variola minor. Variola major* is the more severe and common form of smallpox with a more extensive rash and a higher fever. *Variola major* can be divided into 4 types: *Ordinary* (accounting for 90% or more of the cases); *Modified* (mild occurring in previously vaccinated person); *Flat and Hemorrhagic* (both rare but extremely severe types). *Variola major* has an overall fatality rate of approximately 30%. However, the flat and hemorrhagic types are usually fatal. *Variola minor* is the second type of smallpox. It is less common and much less severe, with death rates of only 1% or less.

For the first 7 to 17 days after exposure, the infected person feels fine and is not contagious (cannot spread the disease). After 7–17 days, the first symptoms of smallpox appear. These include fever, tiredness, head and body aches, and sometimes vomiting. The fever is usually high, in the range of 101–104 degrees Fahrenheit. At this time, people are usually too sick to carry on their normal activities. This stage may last for 2 to 4 days. Next, a rash appears, first as small red spots on the tongue and in the mouth. A rash then appears on the skin, starting on the face and spreading to the arms and legs and then to the hands and feet. Usually the rash spreads to all parts of the body within 24 hours. The rash becomes raised bumps and the bumps become “pustules”, which are raised, usually round and firm to the touch as if there’s a small round object under the skin. The pustules begin to form a crust and then scab. By the end of the second week after the rash appears most of the sores have scabbed over. The scabs begin to fall off, leaving scars. Most scabs will have fallen off three weeks after the rash first appears.

Due to vaccination success, smallpox was said to be wiped out worldwide during the 1980s and no naturally occurring cases of smallpox have occurred since. The *Variola* virus is now completely eliminated, except in the laboratory stockpiles. Today, Smallpox is kept in two approved labs in the U.S. and Russia. However there are concerns that the virus could be made into a weapon and that terrorist may have obtained it to use as an agent of bioterrorism.

INFECTIOUS AGENTS

Variola causes smallpox and exists in 2 varieties: *Variola major* and *Variola minor.*

OCCURRENCE

Smallpox outbreaks occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox that occurred in the U.S. was in 1949, and the last naturally occurring case in the world was in Somalia in 1977. Once the disease was eliminated from the world the routine vaccination against smallpox, among the general public, was stopped because it was no longer necessary for prevention.

RESERVOIR

Humans are the only host. (Smallpox is NOT spread by insects or animals.)

MODE OF TRANSMISSION

Commonly spread by means of prolonged face-to-face contact with someone who has smallpox, direct contact with infected bodily fluids or an object such as bedding or clothing, and by exposure to an aerosol release of smallpox (virus put in air).

INCUBATION PERIOD

Approximately 12–14 days, but can range from 7–17 days.

PERIOD OF COMMUNICABILITY

An infected person becomes most contagious at the time when the rash emerges and develops into sores that break open and spread large amounts of the virus into the mouth and throat.. Around the time the sores in the mouth break down, a rash appears on the skin, starting on the face and spreading to the arms and legs and then to the hands and feet. The infected person remains contagious as pustules begin to form a crust and then scab. Most scabs will have fallen off three weeks after the rash appears, and when all of the scabs have fallen off, the person is no longer contagious.

SUSCEPTIBILITY AND RESISTANCE

Every person is potentially susceptible to smallpox, *if* exposed to the disease; however, since the main virus that causes smallpox has been eliminated by the success of vaccination programs, there is no threat from natural reservoirs of *Variola.* At this time, smallpox vaccine is kept on hand to vaccinate those exposed in the event of a smallpox emergency.

METHODS OF CONTROL

There are only two methods of control to prevent Smallpox; those being vaccination and seclusion from public places for about 3-4 weeks. Vaccination is considered to be the most effective method of control, providing high level of immunity for 3-5 years; decreasing immunity. The smallpox vaccine helps the body develop immunity to smallpox. The vaccine is made from a virus called *Vaccinia* which is a “pox”-type virus related to smallpox. The vaccine contains the “live” *Vaccinia* virus—not killed viruses like many other vaccines. For that reason, a vaccinated person can spread the virus from the vaccination site.

If a person is vaccinated again later, immunity lasts even longer. However people tend to have side effects once they have taken the vaccine such as skin conditions, and people with weak immune systems should not receive the vaccine.