

## Smallpox

Smallpox is caused by the variola virus or Orthopoxvirus. Smallpox was once a feared and highly contagious viral disease that was found in all countries around the world.

The main characteristic of the disease was a rash of blisters or pustules on the skin, which eventually dried up and left permanent scars. Smallpox can be deadly if the virus attacks the circulatory system, bone marrow or respiratory system. As recently as the 1960s, around 12 million people caught this highly contagious disease and approximately two million people died every year.

The World Health Organization (WHO) mounted an aggressive worldwide campaign of immunisation and, by 1979, declared the smallpox disease eradicated. Small stocks of smallpox virus remain in several designated international laboratories.

Vaccination against smallpox is not recommended in Australia and is not presently on the National Immunisation Program Schedule.

### Symptoms

The smallpox virus incubates inside the body for between seven and 17 days, usually for 12 days.

The evolution of symptoms include:

- Fever
- Headache
- Muscular aches and pain, particularly in the back
- A non-specific red rash on the face, body and limbs
- The patient is unwell and likely to be confined to bed
- The rash develops into small blisters or pustules
- The pustules split, dry and scab
- The scabs fall off, leaving scars.

Death can result if the virus attacks the circulatory system, bone marrow or respiratory system.

### Smallpox and vaccination

Smallpox has played an important role in the development of vaccination.

Since ancient times it was common knowledge that an infection with smallpox conferred lifelong immunity. An 18th century doctor, Edward Jenner, first discovered the key to immunising people against smallpox. He noticed that milkmaids hardly ever fell victim to the disease, and hypothesised that their prior infection with the relatively harmless disease known as 'cowpox' may have protected them.

Jenner tested his theory by deliberately infecting a boy with cowpox, harvested from the pus of a milkmaid's skin pustule. Jenner then exposed the boy repeatedly to the smallpox virus, but the boy didn't catch the disease.

The word 'vaccination' recognises Jenner's discovery, since 'vacca' is Latin for cow. However, Jenner and his contemporaries still didn't understand the underlying mechanisms of vaccination, as bacteria and viruses hadn't yet been discovered.

Using a similar technique to that used by Jenner, researchers devised an effective smallpox vaccine based on a similar virus, called the vaccinia virus. Different formulations of this vaccine were used until the 1970's.

### The initiative of the World Health Organization

In 1967, the World Health Organisation mounted a major campaign to eradicate smallpox. Within 12 years, smallpox disease was eradicated.

### **Stores of smallpox and future vaccination**

The only remaining smallpox viruses are contained in two WHO collaborating centres: the Centre for Disease Control, Atlanta, USA, and the Laboratory for Applied Microbiology at Koltsovo in Novosibirsk Region of the Russian Federation.

Smallpox has recently been assessed as a possible biological weapon that could be used in non-conventional warfare or in a terrorist attack. Although this is believed to be unlikely, planning for such an eventuality has commenced worldwide. Some nations have commenced vaccinating sections of their military personnel and emergency medical responders. In Australia, a small amount of smallpox vaccine is available for essential medical personnel in the case of an outbreak.

The current and possible future needs for smallpox vaccination has meant that it is unlikely that the stocks of the varicella virus will be destroyed in the short term.

### **Immunisation programs**

Immunisation has saved more lives this century than any other medical discovery, including antibiotics. Many infectious diseases have been contained by immunisation programs. For instance, cases of invasive Haemophilus influenzae b (Hib disease) in Victoria have declined by more than 80 per cent in the general population, and over 90 per cent among young children, since vaccination was introduced in 1993. Immunisation programs are one of the cheapest and most effective preventative measures against many infectious diseases.

### **Where to get help**

- Your doctor

### **Things to remember**

- Smallpox was once a feared viral disease, common in all countries around the world.
- An aggressive immunisation campaign eradicated smallpox by 1979.
- There is a small risk that smallpox could be released intentionally as a bioweapon and health departments around the world, including Victoria, are planning for this possibility.

### **This page has been produced in consultation with, and approved by:**

Department of Health - Communicable Disease Prevention and Control Unit

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