ERadicating Polio: 50 Years of Vaccines

**Poliovirus: Biology and Disease**

Poliovirus is a small DNA virus that can infect and paralyse children under the age of five. The virus enters the body via the gut, multiplies in the throat and destroys motor neurons in the spinal cord, and then invades the blood stream. If not impeded by antibodies, it can then affect the brain and spinal cord and destroy motor neurons, becoming irreversibly paralysed, usually in the acute phase of polio in which symptoms are observed. While around five per cent of patients experience temporary paralysis in their chest and mouth, multiplies in the throat and enters the blood stream, and around 10 per cent of patients experience asphyxiation due to a virulent form. Live oral polio vaccine virus mutates back to the wild poliovirus if the immune system fails to kill it. The vaccine is shed into the stools of recently immunized children and therefore provides excellent protection against paralytic polio. However, it triggers only low levels of immunity in the gut, whereas OPV (oral polio vaccine) and IPV (inactivated polio vaccine) confer strong gut immunity which limits the spread of the virus to the central nervous system, thereby preventing neuronal damage. OPV with IPV can rapidly stop person-to-person spread from person to person. This explains why mass vaccination campaigns are continuing in readiness for any future accidental or bioterrorism outbreaks caused by circulating OPV strains. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns.

**Iron Lungs**

In the 1950s, huge travelling machines became known as ‘iron lungs’ because of their metal casings with air pumps on the sides. These machines were typically used to treat polio patients and would often keep them alive for several weeks while their muscles recovered. Polio patients who require the use of iron lungs are usually paralysed in their chest and mouth, multiplies in the throat and enters the blood stream, and around 10 per cent of patients experience asphyxiation due to a virulent form. Live oral polio vaccine virus mutates back to the wild poliovirus if the immune system fails to kill it. The vaccine is shed into the stools of recently immunized children and therefore provides excellent protection against paralytic polio. However, it triggers only low levels of immunity in the gut, whereas OPV (oral polio vaccine) and IPV (inactivated polio vaccine) confer strong gut immunity which limits the spread of the virus to the central nervous system, thereby preventing neuronal damage. OPV with IPV can rapidly stop person-to-person spread from person to person. This explains why mass vaccination campaigns are continuing in readiness for any future accidental or bioterrorism outbreaks caused by circulating OPV strains. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns. As part of the ‘end-game’ strategy, many countries have replaced OPV with IPV so as to avoid polio returns.

**Outbreaks**

The two main types of polio vaccine used today are based on these developments for the Salk (IPV) and Sabin (OPV) polio vaccine. IPV is given as an injection, whereas OPV is given orally. OPV remains the vaccine of choice in the majority of endemic countries as it is cheaper to produce than IPV and easier for healthcare workers, needles, or syringes. OPV be given by volunteers without the need for healthcare workers, needles, or syringes. OPV is cheaper to produce than IPV and easier for healthcare workers, needles, or syringes. OPV be given by volunteers without the need for healthcare workers, needles, or syringes. OPV is cheaper to produce than IPV and easier for healthcare workers, needles, or syringes.