

MEDICAL INNOVATION: POLIO VACCINE (PHARMACEUTICAL: BIOLOGICALS)

Physician: Dr. Jonas Salk, Dr. Albert Sabin

Academic: University of Pittsburgh, University of Cincinnati

Organization: National Foundation for Infantile Paralysis (NFIP) – later known as the March of Dimes, World Health Organization

Situation

Widespread infections of pandemic proportions

Poliomyelitis, or polio, is a viral, infectious disease that results from human contact with the polio virus, and can lead to severe muscle weakness, limb deformity, paralysis and death, particularly among children. Although it has been around since the beginning of human history as a source of childhood paralysis, polio was not identified as a distinct disease until the mid-19th century.

Beginning around 1900, the polio virus began to cause a number of localized epidemics in Europe and the United States that in some instances led to widespread infections of pandemic proportions, particularly in the summer months in urban areas. In the United States, a 1952 polio epidemic became the worst outbreak in the nation's history. Of nearly 58,000 cases reported that year 3,145 died and 21,269 were left with mild to disabling paralysis.

Physician-Industry Collaboration

President Roosevelt and the March of Dimes search for a cure

In response to the increasingly devastating outbreaks in the first half of the twentieth century, public and governmental pressure for the development of a polio vaccine in the United States increased dramatically. President Franklin Roosevelt, who was paralyzed at age 39 by a medical condition attributed to polio, founded the National Foundation for Infantile Paralysis (NFIP) – later known as the March of Dimes – as an organization that would spearhead and fund much of the research into the search for a polio vaccine.

The search for a cure became concentrated in the efforts of two March of Dimes grantees, Dr. Jonas Salk of the University of Pittsburgh, and Dr. Albert Sabin of the University of Cincinnati. The doctors took two separate routes to finding a cure. Dr. Salk concentrated his research on finding an injectable, inactivated (or “killed”) polio vaccine (IPV) that was said to be easier to develop and less risky than a live version of the vaccine pursued by Dr. Sabin.

Conversely, Dr. Sabin's theory held that a “live,” orally administered polio vaccine (OPV) would present the best opportunity for eventual eradication of the disease, as it involved no shots, and would provide both intestinal and bodily immunity instead of only bodily immunity that the killed virus would provide.

Dr. Salk discovered his vaccine in 1952, and three years of field testing were required before it was deemed safe enough to be adopted widely in the U.S. Dr. Sabin's vaccine was developed in 1957 and tested for several years largely in Europe before being selected by the National Institutes of Health for worldwide distribution.

Innovation Benefits

Polio all but eliminated in the U.S. and most of the world

The discovery and use of the Salk and Sabin polio vaccines has all but eliminated the disease in the U.S. and most of the world. In 1960, there were 2,525 cases of paralytic polio in the U.S., and by 1965, there were 61. There has not been a single case of polio caused by the wild virus in the U.S. since 1979, with a rare case reported each year from persons coming into the country carrying the virus.

Each year in the U.S. the Sabin vaccine alone prevents about 25,000 people from getting polio; keep about 2,000 people from dying, and prevent about 2,500 people from being completely disabled. In hospital costs in the U.S. alone, enough money is saved each year to more than pay for all the research ever done on polio.

In 1994, polio was declared eradicated in all of the Americas, and in 36 Western Pacific countries, including China and Australia in 2000. Europe was declared polio-free in 2002. As of 2008, polio remains endemic in only four countries: Nigeria, India, Pakistan, and Afghanistan.

Patient Benefits

“Today my fear [for my son] is relieved...”

In March, the first rounds of the [2011 Polio National Immunization Days in Southern Sudan](#) began and were expected to reach an estimated 3.1 million children. Thousands of vaccination teams spread across Southern Sudan – a region the size of Eastern Europe – and administered two drops of the Sabin polio vaccine to all children under the age of 5.

Norah Abdelnabi, age 24, couldn't hide her joy when her 2-year-old son, Steven Kulang received the "two drop" vaccine for the first time. Kulang was born at home in the slums of Khartoum city in Northern Sudan where his family had lived after being displaced by the war in the south which ended in 2005. Two months after he was born, his parents decided to return to the South, and he never received a vaccine.

"I have always been afraid that my son could be attacked by polio because he was not vaccinated but today my fear is relieved. I have seen people crippled for life by polio," said an emotional Abdelnabi.

The polio vaccination campaigns being coordinated by the Government of Southern Sudan's Ministry of Health, WHO and UNICEF are designed to get rid of the polio virus which re-emerged in Southern Sudan back in April 2008. Since then, vaccination has been intensified and no new cases have been reported since June 2009.

"These campaigns will continue until Southern Sudan is declared polio-free and all children are safe from polio. The polio vaccine is safe and even sick children can be vaccinated," said H.E. Dr Luka Monoja, Minister of Health in the Government of South Sudan.

