BioSpectrum the business of Bio & Health Sciences

Celebrating the 60th Anniversary of discovery of Polio Vaccine

10 May 2015 | Views | By BioSpectrum Bureau

Celebrating the 60th Anniversary of discovery of Polio Vaccine

Thanks to the discovery of the polio vaccine by Dr Jonas Salk, 99 percent of the world today is declared polio free, and among them India too. On 27, March 2014, the World Health Organization (WHO) declared India a polio free country.

Poliomyelitis often called polio or infantile paralysis is an infectious disease caused by poliovirus, and it mainly affects children under 5 years of age. Poliovirus spreads primarily through the fecal-oral route, especially in areas where sanitation is inadequate. There is no known cure for polio.

Dr Jonas Salk: The Early Years:

Dr Jonas Edward Salk was born in New York on the 28, October 1914, the oldest of three sons of Mr Daniel and Mrs Dora Salk. Dr Salk graduated from Townsend Harris High School in New York and at the age of sixteen he entered City College to study law. He subsequently changed his mind and in 1939, he graduated with a Bachelor Degree in Science from the College of Medicine of New York University. During his last year in medical school, Dr Salk befriended Dr Thomas Francis, chairman of the Department of Bacteriology, who was conducting important research on influenza (flu) virus and other diseases. Dr Salk worked with him for nine months following his graduation from medical school.

Then, Dr Salk worked at New York's Mount Sinai Hospital from 1940 to 1942. Later, he went to the University of Michigan, to work with Dr Francis where he helped him to develop an influenza (flu) vaccine. In 1944, he was appointed as the research associate in epidemiology, and in 1946 he became the assistant professor.

The Turning point in his life:

The turning point in his career came, when in 1947, he joined the University Of Pittsburg Medical School. While working there, with the National Foundation for Infantile Paralysis, Dr Salk saw an opportunity to develop a vaccine against polio, which had become a much feared epidemic disease in post-war America. He then devoted himself to this work for the next eight years.

1947-1955: The quest for the Polio Vaccine:
At the University Of Pittsburg Medical School, Dr Salk began the long and arduous journey of setting up his laboratory and building a team of medical researchers and associates. They would be his nuts and bolts team, meticulously carrying out research under his direction.

The central element in Dr Salk's efforts was the development of a non-infectious, or "killed virus", vaccine. In his laboratory at the University of Pittsburg, Dr Salk, applied findings from many other scientists, to try and develop the polio vaccine. From so

jonas-salk-100-birtl

me he found a way to produce large quantities of the virus; from others a way to kill the virus with formaldehyde so that it remained intact enough to illicit a response in humans.

Image not found or type

Dr Salk challenged prevailing scientific orthodoxy in his vaccine development. While most scientists believed that effective vaccines could be developed with live viruses, he developed a 'killed-virus' vaccine by growing samples of the virus and then deactivating them by adding formaldehyde so that they could no longer reproduce. By injecting the benign strains into the bloodstream, the vaccine tricked the immune system into producing protective antibodies without the need to introduce a weakened form of the virus into healthy patients.

Research had begun in 1947 and by 1952, Dr Salk had developed his first experimental version of the polio vaccine. It is reported that between 1952 and 1954 more than 5,300 people were inoculated with the test vaccine, including Dr Salk, his wife and his three sons. These initial tests were successful, with no reports of side effects and the successful discovery of polio-fighting antibodies in blood samples.

The Biggest public health Experiment in American history: The Polio Vaccine Clinical trial:
Having successfully tested his polio vaccine on about 5,300 people, Dr Salk and his team began in what could be then considered the world's biggest clinical trial.

Beginning in April, by the end of June 1954, an unprecedented 1.8 million school children, below the age of five were administered the 'Salk vaccine', as it came to known. These children came to be known as the "polio pioneers". The trials were funded by contributions by thousands of Americans and the March of Dimes foundation. For the first time, researchers used the double-blind method, now standard, in which neither the patient nor person administering the inoculation knew if it was a vaccine or placebo.

It took several months to collate the data, when the results were finally verified and certified. On the 12, April 1955, a momentous day in the annals of medical history, it was announced that the Salk vaccine, was "safe, effective and potent", by the end of the day, the American Government granted a license for its manufacture.

The discovery made Dr Salk a 'National Hero' in America and he went on to achieve several accolades and awards. He never patented his polio vaccine.

In the now famous interview on the 12th of April 1955, with Mr Edward R Murrow, American Radio and Television broadcaster, when asked, "Who owns the patent for the vaccine?" Dr Salk, answered, "Well, the people, I would say. There is no patent. Could you patent the Sun?"

The Salk Institute of Biological Studies:
In the 1960s, he established the Salk Institute for Biological Studies in San Diego, USA. Under his direction, the institute began research activities and gradually expanded its faculty and areas of their research interests. His personal research activities included multiple sclerosis and autoimmune diseases, cancer immunology and manufacturing and standardization of killed poliovirus vaccine. He also engaged in research to develop a vaccine for plague and AIDS. To further this research, he co-founded The Immune Response Corporation, to search for a vaccine, and patented Remune, an immune-based therapy.

Even after his great discovery, he continued to undertake vital studies and medical research to benefit his fellowman. Under his vision and leadership, the Salk Institute for Biological Studies has been in the forefront of basic biological research, reaping further benefits for mankind and medical science.

In one of his interviews, Dr Salk is quoted as saying, "I was not trained as a scientist. I was trained in medicine. And, so my functioning, you might say, as a medical scientist, came through being self-taught through the experience of investigating the questions that were of interest to me. And, I had no formal training as a virologist, or as an immunologist. But, I learned what I needed to know in order to address those questions." Dr Salk passed away on June 13, 1995 at the age of 80.

The year 2015 - A series of Coincidences:
12th April 2015, marks the 60th Anniversary of the discovery of the polio vaccine, by Dr Salk.The year 2015 also marks the birth centennial of the discoverer of the polio vaccine - Dr Jonas Salk who was born on the 28th of October, 1914.

This year also marks the 10th death anniversary of Dr Jonas Salk, who passed away on the 23rd of June, 1995.

Author Bio

Mr Sharath Ahuja is a MSc in Industrial Chemistry from the Alagappa University, Karaikudi, Tamil Nadu. He joined the Indian Institute of Science, Bangalore, in 1980, where he is a Technical Officer in the Archives and Publications Cell. He has several scientific publications in National and International journals.
An amateur photographer, an avid traveler and a freelance journalist, Mr Ahuja writes mainly on Science and Technology subjects.