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The Trials and Triumphs of the American Polio Vaccine (Poster)

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ABSTRACT

Today's generation will never know a person who perished from smallpox or have a classmate crippled by poliomyelitis. This is a fact for which the human race should be eternally grateful. There was a time when parents were so terrorized by these illness that they would volunteer their children for experimental treatment, a time where countless prayer were said to beg for a cure or to plead to a greater power to spare your family from harm. This fear has enormous power. It can drive a society into madness or it can unite a community against a common enemy.

This essay hopes to highlight the important moments that lead to the creation of a polio vaccine and discuss its legacy. The tale of the American polio epidemic is tangled with social, political, and scientific narratives. This essay will dissect how these stories interconnect to result in one of America's most proud accomplishments.

INTRODUCTION

Vaccination is one of mankind's most influential scientific advances. It is only the past couple hundreds of years that humans have been able to thwart the illnesses that have plagued our population since the beginning of human existence. Infectious illnesses have claimed the lives of million of people across history and were a major cause of death until the discovery of vaccinations and effective medicines, such as antibiotics. One of the most heinous illnesses was poliomyelitis. The infectious disease is one that primarily affects children and can result in significant paralysis and death.

There was a time that parents were so terrorized by these illnesses that they would volunteer their children for experimental treatment, a time where countless prayers were said to beg for a cure or to plead to a greater power to spare your family from harm. The story of the development of the polio vaccination is a tale of dread, scientific endeavor, trials, and triumph. It is a story about how fear was harnessed to fuel the greatest scientific experiment in American history and a story of how man rid the earth of a frightening, child paralyzing, microscopic monster.

OBJECTIVES

- 1) Provide a historical account of the development of the polio vaccine
- 2) Discuss the social factors that encouraged medical research
- 3) Analyze fear as powerful motivator for social and political change
- 4) Compare/ contrast the differences in parental mindset during the polio epidemic and the anti-vaccine movement
- 5) Discuss the questionable ethics of the polio vaccination trials and how the circumstances differ from modern drug trials

METHODS

- David Oshinsky's "An American Story: Polio in America" served as the main source for the paper. Mr. Oshinsky's references were explored and provided additional sources.
- Dr. Adam Offit's book "The Cutter Incident" also served as a significant source of information with additional sources found through the references.
- Supportive literature was found on PubMed using the MeSH terms "polio", "poliomyelitis", "history", "polio vaccine", "FDR", "Koproski".
- Suggestions for sources were also given by polio history expert, Dr. Daniel Wilson

MAIN FINDINGS

- Polio is a virus that is spread through the oral fecal route and causes paralysis by destroying the anterior horn cells of the spinal cord
- Historically, poliomyelitis was not an epidemic disease
- Increasing sanitation practices in the U.S. decreased the acquisition of natural poliovirus immunity
- FDR not only the most famous polio victim, but also responsible for creating the movement that lead to the eradication of polio
 - Basil O'Connor was also a major player
- NFIP provided funding for polio research and provided financial support to every polio victim in the U.S.
 - March of Dimes



*photos from Google Images and March of Dimes Historical Archive

MAIN FINDINGS (CONT.)

- Previous attempts to create a polio vaccine had deadly results
- In 1953 Jonas Salk created a killed virus polio vaccine that would undergo the largest field trial of a medical product in American history
- The Cutter incident shook America's confidence in the Salk vaccine
 - Left an opening for Sabin and others to produce the oral live virus polio vaccine
- 1987 WHO launched a global initiative to eradicate polio from the planet
 - In 2016 only 37 cases of polio were reported worldwide
 - Unfortunately, the only countries that still report active cases of polio are places that are hard to access due to political conflicts.

DISCUSSION

- In 1911, the NYT portrayed optimism about controlling polio, "Polio would soon go the way of small pox..." This quote portrayed America's confidence in new scientific approaches to medicine, but also reflected their naivety about how complicated public health issues can be. It foreshadowed the challenges to come with managing the polio epidemics.
- Polio and guilt is a recurrent theme throughout. The survivors of polio often feel that contraction the disease it their fault. In a letter to FDR one polio survivor admits, "Your better judgement says we can't control these things. We know we can't. But it's (the guilt) still there". Many felt a parental obligation, especially women, to contribute to the fight against polio which most likely due to parental guilt
- Fear was an incredible motivator in the story of the polio vaccine. Up to date science at the time of the epidemics promoted calm parenting and addressed the realities of how rare it is to catch a case of paralyzing polio. However, the media paints a different story, and creates a frenzy around the debilitating nature of the disease. The fundraising propaganda, though effective, exploited the fears of parents and society by flooding the media with saddening images of children with crutches, confined to iron lungs, and separated from their families.
- Public moral never recovered from the Cutter Incident. There was no government oversight of the vaccination production process until after the incident, but by then the damage was already done. Paul Offit talks about the Cutter Incident being a pivotal point in American medical history as the public's faith in the scientific process is shattered and people become more skeptical of vaccination. It is hypothesized that the Cutter Incident gave birth to the Anti-vaxx movement.
- The war on polio is not over. Post Polio Syndrome is a condition that affects 25-40% of polio victims. PPS survivors will experience new onset muscle weakness, fatigue, and atrophy. Many polio victims describe PPS as "worse" than their initial polio outbreak. PPS effects its victims both physically and mentally as these people experience new limitations and worsening debilitation. In a study looking at QOL markers in PPS survivors, it is evident that modern day physicians do not know enough about PPS or how to treat it, leaving PPS survivors feeling dissatisfied with their medical care.

CONCLUSION

Polio was a disease that struck fear into the American people with its infectious nature and debilitating aftermath. Fear became an intense motivator to fuel scientific endeavors and the social pressures of creating a vaccine turned scientists into demigods. The story of the polio vaccine highlights a unique time in American history as the largest medical experiment of the time and the production of the most mass produced biomedical product were not government funded. The events around the polio vaccine race influenced many things, from how fundraising efforts are conducted to the social views of science and vaccination by the American public.

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