

Unsung women heroes of the polio vaccine breakthrough

An article by David Oshinsky in the Los Angeles Times (12/4/05) argues that amid all the honours heaped on Salk in the 50 years since he made one of the greatest medical breakthroughs of all time, the role played by other scientists, particularly two women, is forgotten. One was Dorothy Horstmann who at Yale University in 1942 set out to discover the route of polio through the body. In what was described as *medical history ..she succeeded in showing that poliovirus circulated briefly in the blood before entering the central nervous system. This meant that a vaccine designed to raise antibody levels in the bloodstream might be able to neutralise the poliovirus before serious harm was done.* Isabel Morgan at Johns Hopkins University took the next step. *Morgan's experiments to immunise monkeys against polio brought very promising results. In the late 1940s, her primates, vaccinated with a killed-virus solution, were able to withstand high concentrations of live poliovirus without succumbing to the disease. None showed the telltale symptoms of paralysis. But in 1949, in the prime of her career, the 38 year-old Morgan left Johns Hopkins to marry and become a homemaker. Had she remained, it's quite possible she would have beaten Jonas Salk to the killed-virus vaccine. The next step involved the testing of children, one she never got to take.* Horstmann became the first woman professor of medicine at Yale in 1961. Morgan returned to work in cancer research in the 1960s. Her bust is the Polio Hall of Fame at Warm Springs.

Kano polio survivors unite

The refusal, for some months in 2004, by officials in Kano, Nigeria, to allow polio vaccinations has been the major cause of the recent spread of polio to 16 countries that had been previously declared polio free. However Kano also has an active post-polio support group. Twenty years ago they formed the *Kano Polio Victims' Association* to help survivors learn a trade so that they did not have to beg for a living. It has 5000 registered members. Post-Gazette.com (29/4/05) writes; *Underneath their long silk caftans are shrivelled limbs. Some hobble on crutches. Some crawl, lifting themselves slightly off the ground with two wooden blocks. Others walk spiderlike through the dirt on their knees, their hands tucked into sandals. On this spot of borrowed ground men and women gather each day under canopies of guinea corn leaves and in a tin shack to build the tricycles, knit infant sweater sets and make petroleum jelly to sell.* The group have now begun to focus on advocacy. They accompany the immunisation teams into areas of resistance *to show doubters what can happen if their children don't get the vaccine.* The cooperative's land is under treat as the owner plans to build on it. It receives little help from the government or foreign agencies which makes many survivors bitter. One said, *The United Nations' effort to eradicate polio is like a parable of two houses. One house is on fire, the other is safe. The UN is putting all its efforts into making sure the fire from the burning house doesn't reach the*

safe one, while allowing the burning house to burn down. We, the polio victims, represent that house on fire...We have already been ravaged. The UN and other agencies ought to give attention to us to assuage our pain; sentiments most polio survivors have felt at times.

Polio and Warm Springs made the man

A television film, *Warm Springs*, recently shown on US TV stars British actor Kenneth Branagh as FDR. The Chicago Sun-Times review (29/4/05) wrote: *Branagh embodies the president-to-be at the critical turning point of his life [when he contracted polio]...In a wheelchair, believing his political career is over...FDR retreats to Warm Springs. At first, it's clear he wants to hide from the world. Then he begins to believe in a cure. But as he takes in the poverty of the region and adapts to his physical limitations, he finds renewed purpose... 'Warm Springs' portrays an enlightening episode that doesn't figure in many history books. Not only did Roosevelt clean out his trust account to buy Warm Springs, but he died there, in the tiny cottage known as 'the little White House', in the 13th year of his presidency. It's still a rehabilitation center today. We haven't forgotten Roosevelt or his impact. But it's one thing to know that he guided the nation through the Depression and a world war; it's quite another to watch him make people forget he's a paraplegic. 'Warm Springs' suggests that FDR's physical weakness wasn't just a political setback—it was the source of his strength.* Let's hope it shows on Australian TV.

Shaggy dog cure for polio

Miracle dog licks polio: Pet 'heals' crippled Wendy was a headline in the *Daily Record*, a Glasgow newspaper, on 29/3/05. Wendy Francis, a polio survivor, had had no movement in her feet for 50 years but on Easter Sunday her dog licked her feet and Wendy felt tingling and found she could wiggle her toes. Experts are baffled reports the paper which quotes a microbiologist as saying, *'We are still learning about how polio develops in people over the years. All I can say is good luck to her; I can't see it doing much harm'*. Wendy says she is going to let her dog lick her toes as much as he wants.

How long does the Sabin vaccine related poliovirus survive?

The editorial of the British medical journal, *The Lancet*, (3/5/05) says that *one of the outstanding 'endgame questions for polio eradication is how long vaccine related polioviruses will circulate after the cessation of the use of the Sabin vaccine.* It reports a recent study by Sue Huang and colleagues in New Zealand where there was a change from the Sabin back to the Salk vaccine in 2002. For 18 months after the switchover they monitored cases of acute flaccid paralysis, poliovirus excretion in children in hospital, people with suspected enterovirus infection and sewage plants. The first three methods revealed no poliovirus after two months except in one child who had conjunctivitis. Virus in sewage fell during the first three months and after that was only detected once every three months. (This was probably caused by people who had recently received Sabin vaccine in other countries). These findings suggest that there has been little if any

persistence of Sabin related virus in New Zealand. However the editorial asks, *what happens if vaccination with OVP [Sabin] is stopped without switching to IVP [Salk] as will happen in many tropical developing countries?* The recent cessation of vaccination in some parts of Nigeria because of the boycott in the province of Kano resulted in the spread of wild poliovirus *to eleven [now a higher number] countries previously free from poliomyelitis. Compared with in New Zealand, the risk of importation of vaccine-derived or wild poliovirus from neighbouring countries is much greater in land-locked central Africa. Nevertheless the isolation from sewage of probable imported strains in New Zealand indicates that even this island nation is not immune from poliomyelitis importation. While the lack of long-term persistence of vaccine-related poliovirus in New Zealand is encouraging, it does not allow for the cessation of poliovirus vaccination in any country. There is no room for complacency in the poliovirus eradication endgame.* The question remains as to what will occur in developing countries in the long term after the WHO initiative ends.

Polio survivors receive state compensation.

The Israeli newspaper *Haaretz* reported on 7/7/05 that new legislation will provide around 2,000 polio survivors with a one time payment of state compensation for not being vaccinated against polio and for treatments that worsened their condition. Polio was prevalent in Israel in the 1950s. The vaccine was introduced in 1959 and by 1988 the country was polio-free. The prime minister of the time, David Ben-Gurion, promised survivors free medical treatment and equipment but this never happened. A spokesperson for polio survivors is quoted as saying that the new law *corrects an injustice of many years when the government refused to admit its guilt for the spread of the epidemic and damages suffered by victims because of inept treatment, medical experiments and unnecessary operations.* One survivor said: *They put most of us in isolation in a church in Jerusalem and got our parents to sign an agreement to experimental treatments and operations. They grafted bones and muscles, tried to straighten legs and operated on backs and thighs. Some people underwent 20 operations.* Survivors' payments will be based on the number of years they have had polio and their monthly disability grant will be increased.

Hope of future treatment for PPS

Post-Polio Health International (it used to be known as GINI) held its Ninth International Conference on Post-Polio Health in St Louis in May, 2005. I have been reading the synopses of the papers and one of the most interesting is *Immunopathogenesis of the post-polio syndrome* by Kristian Borg, Henrik Gonzalez and other researchers from Sweden. They refer back to their previous research findings of *a chronic inflammatory process in the [cerebrospinal fluid of the] CNS of PPS patients* and their finding that this can be reduced by intravenous immunoglobulin. This was associated with an improvement in muscle strength and quality of life in patients treated. The researchers have now conducted a multi-centre, double-blinded and placebo-controlled study to examine whether their previous finding stand up to this rigorous test. The results

supported them. Berg and his colleagues found that patients with PPS given immunoglobulin showed a significant improvement in muscle strength, an increase in physical activity, a decrease in pain and an increase in their rated quality of life. They conclude *there is an inflammatory process in the CNS of patients with PPS. The origin of the inflammatory process is unknown but it may play a part in the pathophysiology of PPS. The inflammation is down-modulated by means of treatment with intravenous immunoglobulin leading to a clinical improvement. This might lead to new therapeutic strategies for the treatment of patients with PPS.* Such possible treatments are not going to be available in the near future. At the time of presentation Berg and his colleagues had submitted their papers to scientific journals for publication but they were yet to be accepted and published and the information disseminated among doctors. While the improvements cited were statistically significant I did not get the impression this treatment would allow recipients to take part in the Sydney-to-Surf race. These findings link in with the research Dr Marcia Falconer talked to us about at her seminar last year so we will look forward to what more she has to tell us at her next talk in May, 2006.

Polio cases in the USA

In September 2005 a baby in Minnesota, who was admitted to hospital with an immune condition, was found during tests to have polio. The child, who did not have any symptoms of paralytic polio, was found to have a strain of virus found in oral polio vaccines that had not been used in the USA for five years. The child had not been vaccinated against polio because of its (the gender of the baby and other identifying information has not been released) medical problems. Investigators began testing relatives and people who had close contact with the child to find if anyone else had been infected. This is the first case of polio infection reported in the US since 2000 when the country stopped using the oral vaccine and reverted to the Salk vaccine. In October Associated Press reported that the baby came from an Amish community and three other children there had been found to be infected with the same polio virus though again they showed no symptoms. These children were siblings and had not been vaccinated. They were not related to the baby but had been in contact with it. Officials are investigating how an infection from a vaccine given in another country reached Minnesota. Some families in the Amish community are allowing their children to be vaccinated while others are not. Officials fear that without the community's cooperation there is a chance of an outbreak similar to one that occurred in 1979 in Amish communities in Iowa, Wisconsin, Missouri and Pennsylvania which left ten people paralysed. At that time wild (as opposed to vaccine related) polio virus was introduced into the communities by a visitor from Europe.

Rally by Nigerian polio survivors.

Reuters (9/11/05) reported that around 1,000 Nigerian polio survivors staged a rally in Kano to encourage parents to have their children vaccinated against polio. The state of Kano has been the epicentre of resistance to vaccination following the pronouncement by Muslim clerics that vaccines were being used by the West to

spread HIV or make Muslims infertile. The ban lasted 10 months but that was long enough to allow the spread of polio to 18 other countries and setback the global campaign to eliminate polio. Although vaccination has recommenced the response of parents has been slow according to Aminu Mohammed Tudon Wada, chairman of the Polio Victims Association of Kano and '*That is why we decided to stage this public demonstration*'. The demonstrators included adults and children. Many rode hand-pedalled tricycles or boards with wheels. During the demonstration they visited the state governor and the emir to gain their support for the round of intensive vaccination due to commence the following week.

A comeback for iron lungs?

The bulky iron lung respirator, invented in 1927 is, *essentially a metal box with two vacuum cleaners which applies negative pressure to pull a patient's chest cavity upwards, allowing the lungs to fill with air*. Since the end of the polio epidemics only a few survive in Australian hospitals. They are still used in the Austin hospital in Victoria *keeping alive polio survivors and patients with progressive conditions such as muscular dystrophy*. *The Australian* (21/11/05) reported that the iron lung *could return to intensive care units as researchers claim it can be more effective than the equipment that replaced it*. Dr Mark Howard director of Respiratory Support Services in Victoria is quoted says that one advantage is *that iron lungs used negative pressure while mouth ventilators use positive pressure to help the patient breathe*. '*Trying to expand the lungs through negative pressure may be more effective in preventing collapse*.' Using an iron lung also removed the need for 'invasive' ventilation such as a tracheostomy.

Cartoon novelette history of polio

Polio: a virus' struggle, a cartoon story by James Weldon, has the polio virus telling its story at a group therapy session of the *Diseases Nearing Eradication Support Group*. The hexagonal virus sits on a chair and has its turn after smallpox ends its tale in tears. '*Okay, ummm...hi, my name is poliomyelitis, and I'm nearing eradication...I'm a contagious epidemic enterovirus or at least I was until the vaccine...*' The 14 page story can be found at www.bioteach.ubc.ca/quarterly/?p=45. It's a great vehicle for telling children about polio and vaccination. It's very informative with lots of amusing bits. '*Everything was going well says polio until I infected someone famous. In 1921 I was contracted by Franklin Delano Roosevelt. I was such a fool! I should have known he'd run for office!*' 'Leprosy responds '*Polio, you can't blame yourself...*' *I panicked LA in 1935, and all the time they were trying to contain me the wrong way, isolating the clinical cases and ignoring the asymptomatic carriers. They were treating me like TB*'. The emails to Ask Mary indicate that polio is a very popular topic for school projects and this is a good reference.

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