Medicine for Managers

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Poliomyelitis

As a relatively small boy in about 1953, I can remember the panic which ensued when an outbreak of poliomyelitis was announced. The swimming pools were closed, people were concerned about going to large shops and there were questions about whether schools should remain open. I have a vivid recollection of an Iron Lung in the early soap *"Emergency Ward 10"* on the television.

One of the great medical advances has been to virtuallty eliminate polio in the UK. After those epidemics in the 1940s and the 1950s, when thousands of cases were identified, a vaccine against the virus was introduced in 1956. It is recorded that the most recent case of polio naturally acquired in the UK was in 1984. Something of the order of forty cases have been reported in the UK in the last thirty years but the infections have generally been acquired abroad or have occurred as an exceedingly rare complication of the attenuated polio vaccine. In 2014 the disease was reported as only spreading in Pakistan, India, Nigeria and Afghanistan.

The virus is transmitted by direct person-to-person contact with infected mucus from the nose or mouth or via the faeco-oral route. The virus enters through the mouth, multiplies in the throat and gut and then spreads through the body. The incubation period is up to five weeks. Most patents do not have symptoms. Outbreaks still occur round the world but are confined to a relatively few countries in Africa and Asia, where immunisation rates are poor.

The results of acquiring the disease may be very variable. ***90-95% of cases*** are associated with ***no symptoms***. Another ***4-8% of cases*** result in a ***minor illness***. They exhibit the symptoms of general malaise, headache, fever, sore throat and vomiting. The symptoms may last for about three days and then subside without sequelae. In about ***1% of cases*** the virus enters the central nervous system. Most patients in this category develop severe headache, neck and back pain, abdominal pain, severe vomiting and fever with lethargy and irritability. Of this group about 1 in 2-500 develops ***paralytic disease***. The muscles become weak, atonic and motor control is lost. Finally they are completely paralysed.

A diagnosis of paralytic poliomyelitis may be clinically suspected in someone who has recently returned or lived in a country where polio still exists and who has developed an

acute flaccid paralysis without sensory loss where it cannot be attributed to another cause.

The symptoms of paralytic polio are a high fever, severe headache, neck, back and peripheral pain, muscle pain, progressive difficulty in swallowing, pins and needles and bowel and urinary disturbances. The paralysis may begin within twenty-four hours or may occur up to ten days after the onset of symptoms. The risk of paralysis increases with advancing age. In children paralysis is very rare and tends to be focal whilst in adults the frequency is more than one in 100 and tends to be generalised. In children paralysis of one leg is most common whilst in adults extensive paralysis affecting all four limbs and the chest is much more likely.

An astute physician might suspect a diagnosis based on travel history, symptoms and signs including abnormal reflexes, neck and back stiffness, difficulty lifting the nead and neck stiffness. Tests ordered would include a lumbar puncture, viral cultures and antibody studies.

The poliovirus is an *Enterovirus*. There are a number of different types with incubation periods ranging from 3 to 35 days. The nature of the symptoms varies with type including the likelihood of paralysis.

Protection against the disease can be achieved by vaccination and polio forms part of the childhood vaccination schedule. The NHS schedule consists of:

2 months: 5 in 1 injection (Diphtheria, Tetanus, Whooping cough, **Polio**, Hib (prevents pneumonia and some meningitis)
3 months: 5 in 1 injection
4 months: 5 in 1 injection
3y4m to starting school: 4 in 1 injection (as above but without Hib)
13-18y: 3 in 1 injection (as above but without Hib or whooping cough).

Treatment of poliomyelitis

As with all viral illnesses there is no specific treatment and management of the disease is limited to controlling the symptoms whilst the infection is overcome by the body's own defence mechanisms. Treatment may take the form of antibiotics for any associated bacterial infections, pain relief for the control of headache and muscle pain and muscle relaxants to control any spasms. Heated pads are also helpful for muscle symptoms. Patients with a severe attack of poliomyelitis may need emergency intensive care management including assistance with breathing.

The prostrating nature of the illness may result in complications aggravated by immobility. Aspiration pneumonia, muscle wasting, lung infections and urinary infections may develop. In severe cases muscle paralysis, wasting and dysfunction are possible consequences.

The prognosis depends of the form of the infection, the severity of the symptoms and whether the features are non-paralytic or paralytic. Usually complete recovery occurs. If

the brain or spinal cord are affected, paralysis and death are real risks. Disability is more likely than death resulting in weakness over a particular area.

Post-polio syndrome.

Post-polio syndrome may occur in patients who had polio when they were younger. They had therefore acquired the infection in the 1940s and 1950s. It is not known what percentage of polio sufferers are subsequently affected. It takes an average of about thirty years before the symptoms become noticeable. The features include lethargy, tiredness, increasing fatigue, muscle pain and weakness and joint pain, breathlessness and insomnia.

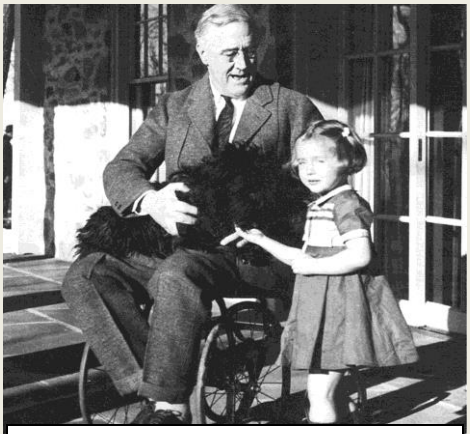
It is not known why they develop but is thought to be associated with the deterioration of nerve cells damaged by the original poliovirus infection. As polio is no longer naturally acquired in the UK, the number of sufferers will steadily decline and ultimately disappear.

There is no cure for the condition and management is symptomatic with mobility aids, pain relief and any other support that is required.

Polio has been known as a cause of wasting and paralysis for thousands of years and appears in the writings of the ancient Egyptians and the Greeks.

However, like so many other medical conditions, it was first described as an entity in the eighteenth century by the English physician Underwood who described it as a debility of the lower extremities. Further developments were made by a German orthopaedic surgeon in 1840 and the Swedish physician Medin in 1890, who described the epidemic nature of the disease. In the early 1900s, Landsteiner, who had first isolated blood groups, discovered and isolated the virus responsible for polio. His work led to the search for a vaccine against the diease which culminated in the development by Salk in America in 1952 of the first vaccine.

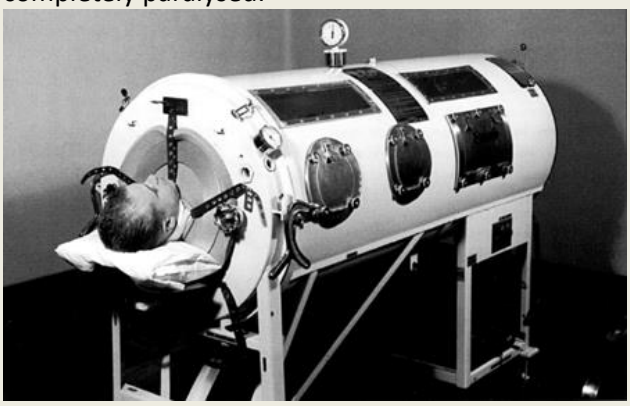
Many famous people have survived polio, amongst them Franklin D Roosevelt, the American President during the second world war, Donald Sutherland Mia Farrow, actors,



Franklin D Roosevelt

Kerry Packer, Jack Nicklaus, Ian Dury and many others.

Finally, back to the iron lung. Its proper name was the ***negative pressure ventilator*** and it enabled a person to breathe when the respiratory muscles had been compromised or completely paralysed.



The patient was placed in the ventilator, which was in the form of a cylindrical steel drum. The head was outside the ventilator and was sealed round the neck. The pressure inside the tube was raised and lowered. When the pressure fell, air outside the device would move into the lungs to fill them. When the pressure rose inside, the elastic recoil of the lungs would empty them. The first such ventilator was invented in about 1928 and was superceded by more modern ways of ventilating a patient in the late 1950s. It is not difficult to see how frightening a prospect it was.

The eradication of polio is a continuing success story. As ***Bill Gates*** said:
"Polio's pretty special because once you get an eradication, you no longer have to spend money on it; it's just there as a gift for the rest of time"

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