POLIOMYELITIS IN AYURVEDA W.S.R. BALPAKSHAGHATA

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ABSTRACT:

Poliomyelitis is one of the hazardous diseases by which the victim gets permanently disabled and depends on others for his future life. Immediately after the onset of this disease, the child should get proper nursing care and treatment to avoid deformities and contractures. The child may get deformities as early as a month after the onset of paralysis. Many polio children are getting significant improvements after the administration of Ayurvedic treatments. in Ayurveda there is no standard treatment procedure available for the physicians who are working in this direction. Inclusion and incorporation of new diseases and their managements which were prevalent in their periods are not new to Ayurveda. From time to time Ayurveda acharyas has included many new diseases with their managements in their respective classics. Poliomyelitis (Balpakshaghata) is one of such diseases not described clearly should be included and elucidated with present available modern medicine. Even today millions of children, particularly in developing countries are being affected by the Balapakshaghata and remained a big problem before medical experts. It is as a curse to the affected individuals making their lives more miserable and dependent on others.

Key words *: Polio, Balpakshaghata, diseases, paralysis.*

INTRODUCTION:

Poliomyelitis is a highly infectious disease caused by a virus belonging to the Picornaviridae family. It finds a mention even in ancient Egyptian paintings and carvings. The clinical features are varied ranging from mild cases of respiratory illness, gastroenteritis, and malaise to severe forms of paralysis. These have been categorized into inapparent infection without symptoms, mild illness (abortive poliomyelitis), aseptic meningitis (nonparalytic poliomyelitis), and paralytic poliomyelitis. This disease has been associated with crippling deformities affecting thousands of lives throughout the world. Only due to the perseverance and determination of great scientists in 1900s, the genomic structure of the virus and its pathogenesis could be elucidated. Contribution of Salk and Sabin in the form of vaccines—oral polio vaccine (OPV) and the inactivated polio vaccineheralded a scientific revolution. In 1994, the World Health Organization (WHO) Region of The Americas was certified polio free followed by the WHO Western Pacific Region in 2000 and the WHO European Region in June 2002 of the 3 types of wild poliovirus (types 1, 2, and 3). In 2013, only 3 countries remained polio endemic—Nigeria, Pakistan, and Afghanistan. Global eradication of polio is imperative else the threat of an outbreak will hover forever. Today, all the governments of the world in collaboration with WHO stand unified in their fight against poliomyelitis and the task when achieved will pave the way for eliminating other infections in future.

HISTORY OF POLIO :

First known description of polio in modern medicine was mentioned by underwood in 1789. Polio epidemics have been noticed through out the world by many scholars in 19th century. Major part of the work done in 20th century itself. In the year 1951, there types of polio virus was isolated and identified by sabin and he prepared live vaccine in 1955 to prevent polio myelitis.

Prevention, treatment and Rehabiliation are the three principle methods to eradicate the polio completely. Prevention and Rehabilation, these two are implementing by the govt. And various voluntary organisations by organising mass immunization programmes and rehabilitation campus.

LABORATORY DIAGNOSIS :

The current method of diagnosis is polymerase chain reaction (PCR) for detection of poliovirus, which can be isolated from samples of stool, throat swabs, blood, and cerebrospinal fluid (CSF). Stool samples of the infected person are the primary sample source. The virus is excreted intermittently for a long period of 1 to 2 months after infection. In all, 80% of exposed people excrete the virus in the first 2 weeks, which declines to around 25% in the third week. Therefore, 2 samples of stool must be collected ideally at an interval of 24 hours within 2 weeks' time for maximizing the chances of isolation of virus. Presence of the virus in the oropharynx is usually early in the infection. The virus can rarely be isolated from CSF in cases of aseptic meningitis. During first phase of viremia (3-5 days after infection), virus can be isolated from blood, but it is not of diagnostic importance.

MODE OF TRANSMISSION:

The spread of the disease is through the fecal-oral route. The dissemination of the virus in the feces is the reason of it being a highly communicable disease. Maximum excretion of the virus is seen in 2 to 3 days prior and 1 week after appearance of symptoms.The spread is rapid in areas with poor sanitation, especially among the nonimmune population. The propagation of the virus is mainly seen in summer months in temperate regions. Tropical regions have no such distinction.

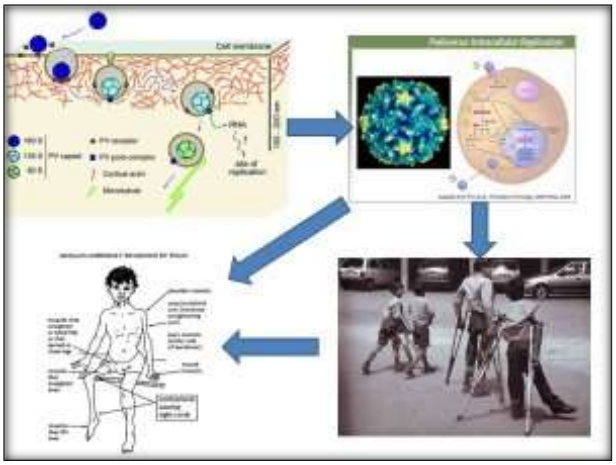
Poliomyelitis has been present endemically through infection among susceptible infants. Mainly due to the presence of antibodies to all the 3 serotypes of the virus (types 1, 2, and 3) in women of childbearing age and also due to the protective effect of maternal antibody, infants can be infected and protected simultaneously without any residual effects. The disease changed its form from endemic to causing various outbreaks of paralysis only in the late 19th century. Improper sanitation facilities and lack of personal hygiene were found to be the most important contributory factors, which led to infants getting exposed to the virus at an age beyond the protection of maternal antibodies.

Pathophysiology: Poliovirus enters the body through the mouth, infecting the first cells with which it comes in contact—the pharynx and intestinal mucosa. It gains entry by binding to an immunoglobulin-like receptor, known as the poliovirus receptor or CD155, on the cell membrane. The virus then hijacks the host cell's own machinery, and begins to replicate. Poliovirus divides within gastrointestinal cells for about a week, from where it spreads to the tonsils (specifically the follicular dendritic cells residing within the tonsilar germinal centers), the intestinal lymphoid tissue including the M cells of Peyer's patches, and the deep cervical and mesenteric lymph nodes, where it multiplies abundantly.

The virus is subsequently absorbed into the bloodstream [15]. Known as viremia, the presence of virus in the bloodstream enables it to be widely distributed throughout the body. Poliovirus can survive and multiply within the blood and lymphatics for long periods of time, sometimes as long as 17 weeks. In a small percentage of cases, it can spread and replicate in other sites, such as brown fat, the reticuloendothelial tissues, and muscle.

This sustained replication causes a major viremia, and leads to the development of minor influenza-like symptoms. Rarely, this may progress and the virus may invade the central nervous system, provoking a local inflammatory response. In most cases, this causes a self-limiting inflammation of the meninges, the layers of tissue surrounding the brain, which is known as non-paralytic aseptic meningitis.

Penetration of the CNS provides no known benefit to the virus, and is quite possibly an incidental deviation of a normal gastrointestinal infection. The mechanisms by which poliovirus spreads to the CNS are poorly understood, but it appears to be primarily a chance event—largely independent of the age, gender, or socioeconomic position of the individual



CLINICAL FEATURES:

Clinical features have been classified according to the severity of symptoms. The majority of exposed patients (around 95%) are asymptomatic. During this period, there is shedding of the virus in stool and it can be isolated from throat swabs also. The ratio of asymptomatic to paralytic cases ranges from 50:1 to 1000:1.[10] Abortive poliomyelitis, which is a mild viremic form, accounts for around 4% to 8% of infections. There may be gastroenteritis, influenza-like illness, and mild respiratory tract infections, which usually subside within 1 week. Around 1% of the clinical cases present as aseptic meningitis.[9] There can be severe muscle spasm of the neck, back, and lower limbs, which follows a brief prodrome like the one in abortive poliomyelitis. Complete recovery usually takes place within 10 days. The most severe form, paralytic poliomyelitis, which is seen in less than 1% of patients, presents as excruciating episodes of pain in back and lower limbs. In children, the disease may present in biphasic form—a period of prodrome followed by a brief symptom-free period of 7 to 10 days and then appearance of asymmetrical paralysis of limbs. Flaccid paralysis is the hallmark with loss of deep tendon reflexes eventually.

Recovery may be complete in some patients but if loss of motor functions persists beyond 12 months, lifelong disability ensues. The 3 forms of paralytic poliomyelitis are spinal poliomyelitis, which is most common, bulbar poliomyelitis (2%), and a combination of above 2, bulbospinal poliomyelitis (around 19%)[4] Bulbar poliomyelitis has the maximum fatality as the brain stem neurons are involved. In PPS, there is progressive muscular weakness, joint deterioration, and increasing skeletal deformities. Fatigue, following even minimal physical activity may lead to severe handicap of the day-to-day functioning.

POLIO IN AYURVEDA:

The disease *Balpakshaghata* has not been described directly in *Ayurved* classics, but many *ayurved* experts are considering this disease as polio Myelitis. It is well known fact that polio myelitis usually starts with the symptoms of temperature of variable duration and severity, headache, sore throat, diarrohoea or constipation, joint pains and mild stiffness. Once the paralytic stage occurs the above symptoms gradually subsides. The residual symptoms of fever i.e. paralysis of limbs persists through out the life of the child making him complete dependent on others. in *Ayurveda* it has been considered as one of the varities of vatavyadhis mostly because of paralytic symptoms. These are follows :-

1- ***KHANJA :*** Acharya charaka has mentioned the disease khanja while describing 80 Varieties of Vatavyadhis. Simply he has included in the list of vatavyadhis. Whereas the later scholars like Acharya susruta and vagbahata have described the diseases in an aphoristic manner. Vitiated vayu localised at kati produces flaccidity weakness in the muscles of one lower limb is known as khanja.

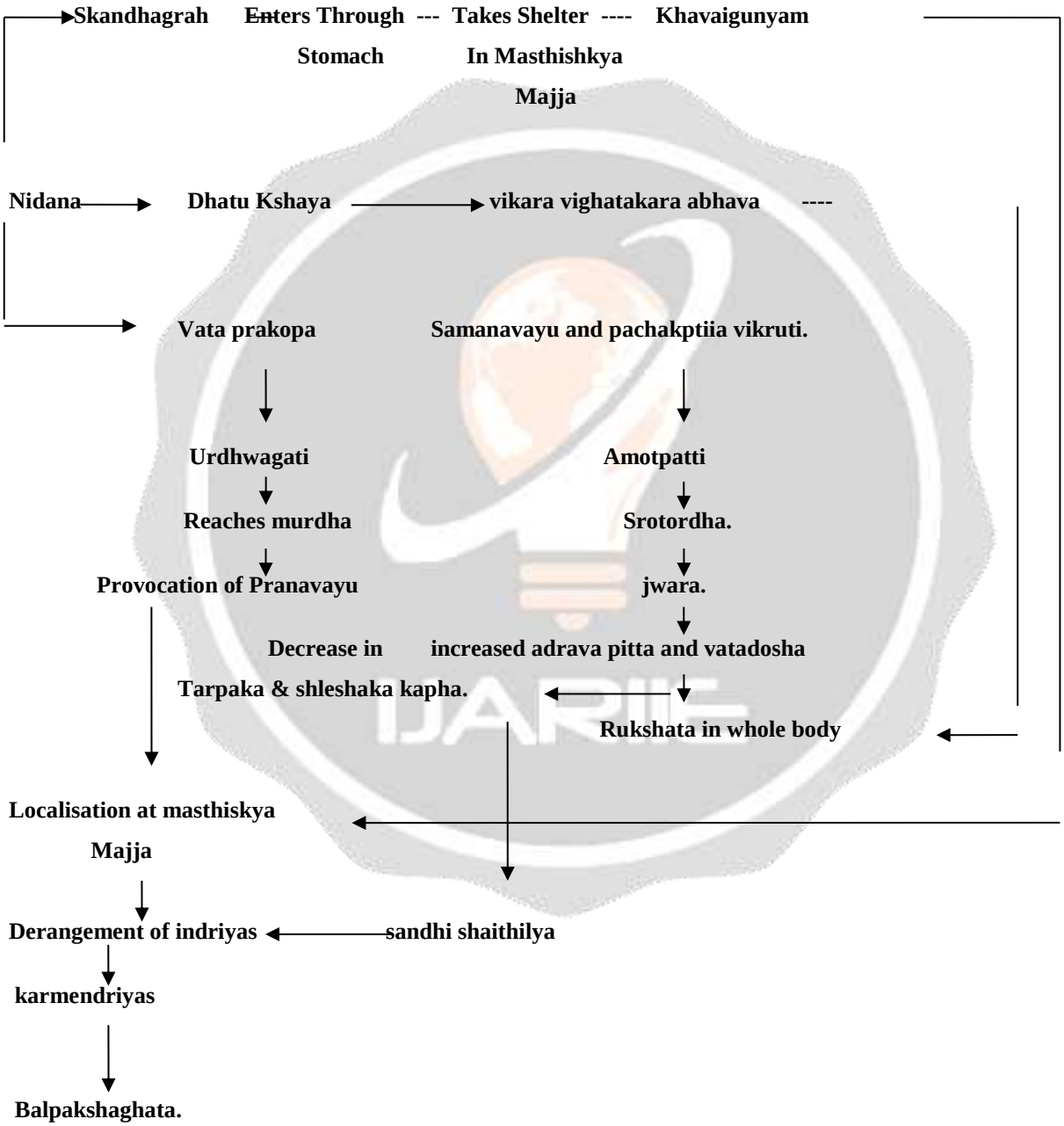
2- ***PANGU:*** Pangu is also inserted in 80 varieties of vatavyadhis by charaka. But he has not described it clearly. Brief description of this diseases is available in susruta samhita. Vitiated vayu localised at kati region and produces the flaccidity as well as weakness in the muscles of both lower limbs is known as pangu . Acharya dalhana clarifying on this subject says that *sarvatha gatighatat pangurityarthah*. The patient cannot stand and walk due to weakness in both the legs.

3- ***PAKSHAGHATA:*** Morbid vata takes seat in half of the body seizing the siras and snayus producing loosensess in almost all the joints in the affected side, as a result patient cannot platform any function with the particular limbs. Some patients may get semiconciousness or unconsciousness. It half of the body is involved form face to lower limb by vitiated vata. It is known as pakshaghata. In case any one limb is affected then disease can be called as ekangavata. If all the four limbs get involved and functionless the disease has been named as sarvangroga.

4- ***AVABAHUKA:*** Morbid vayu affects the Amsa pradesha by seizing the siras and snayus at that place resulting in the little bit dragging or contractions of the shoulder joint. Susruta clearly says that vitiation of vata and kapha doshas and injury to sira in the shoulder joint produces the avabahuka disease. The disease Avabahuka mainly affects middle aged people. Males are more affected than female and seen commonly in cold climate. Nasyakarma is indicated as specific treatment along with snehapana immediately after food.

5- ***PHAKKA ROGA:*** Acharya kashyapa described that this disease occurs in children with the symptoms of chestahani and shosha and the child does not walk even after one year. Main cause for this disease is considered as *stanyadushti*. The child happens to be the victim of the disease during breast feeding. This disease occurs in three ways according to the origin. They are ***ksheerajam, Garbhajam, Vyadhijam***.

SAMPRAPTI :



MANAGEMENT OF POLIO :

Natural Ayurvedic Treatment of Polio: Polio is a very deadly virus and though partly eradicated through an extensive worldwide immunization programme it is still around and wreaking its deadly havoc upon parts of the population. It is a highly infectious disease and enters the body through the mouth and goes onto attack the central nervous system. The cause of this despite extensive medical research has yet to be found. Though many who catch the

virus survive most that do are left with a form of paralysis, usually in an arm or a leg. Though it is unable to offer a cure, Ayurvedic can alleviate the pain experienced by sufferers and can also aid survivors' recovery greatly.

Ayurvedic Cause of Polio: Paralysis or more specifically polio is caused according to Ayurvedic when there is a divergence in vata-pitta-kamba which affects the dhosa (energies of the body). This physiological shift causes toxins (ama) to build up and attack the nervous system. To be treated positively Ayurvedic says that there must be a re-balancing of these within the body. To achieve this state the following methods should be applied.

Ayurvedic Remedies for Polio: As previously stated any form of the Ayurvedic programme can not cure polio. But what it can do is offer a healing regime that repairs the damage wrought by the disease. This takes two forms Herbal remedy and intensive Ayurvedic massaging. The herbal remedies can eradicate internal disorder and strengthen the immune system.

Massage alleviates the on-going pain and any paralysis that may have occurred. In this instance intensive massages repair the dead and wasted muscle. Massaging also allows the affected area or joint to receive nutrients which can expel toxins.

Massage applied to remedy polio in Ayurvedic: As possibly befits the remedy for such a deadly serious disease like polio, Ayurvedic prescribes arguably its' most important massage form in the treatment of the disease, namely the method known as Pindasvedka or Navarakizhi. This treatment revitalizes mainly the skin and is also used with Ayurvedic anti-ageing treatments. However in achieving this it also rejuvenates dead and wasted muscles which are why it is used as a remedy for paralysis, which is why it used on polio sufferers.

The revitalizing agent in Pindasvedka or Navarakizhi: Pindasvedka or Navarakizhi is a simple remedy consisting of medicated rice. The rice provides carbohydrates which rejuvenate the affected areas when applied. Pindasvedka or Navarakizhi is applied in Ayurvedic

A fine cloth of the medicated rice solution is placed upon the patients' body. This creates gradual warmth and is applied until the patient builds up a great sweat. The act of sweating expels the toxins and in doing so begins to rejuvenate the affected areas.

The Ayurvedic way to alleviate the pain caused by polio and to treat it is mainly massage based. But the imbalances caused by the pitta-vatta-kamba shift that disrupts the internal systems of a polio sufferer can be put right by ingesting certain herbs and spices. They can be added to cooking and will aid the healing processes of paralysis sufferers.

Herbs and spices recommended in the Ayurvedic cure for polio :

1. Fennel
2. Ginger
3. Black pepper
4. Coriander
5. Licorice

PREPARALYTIC STAGE :

- complete, Rest, Physcially & Mentally, patient should be kept warm with the help of woollen cloths.
- To improve digestion the following measures should be taken.
- Leuk warm water should be given whenever the child gets thirst.
- Milk boiled with long pepper should be given.
- Previously if child is consuming soild foods we should give fresh and hot lassi/ Yavagu after seeing the appetitie.
- Fresh Yusha prepared with green gram should be given.
- Kichidi prepared with green gram is to be givem .

If there is constipation, should be relieved by simple laxative or shodhan basti.

- Castor oil 10 to 15 ml.
- Rasayana haritaki churna 250 mg to 500 mg. At bed time with luke warm water od.
- Shodhan basti: (Triphala quath 100 to 150 ml. Mixing with 50 ml. of Til oil)

DRUGS : Any one of the following drugs should be given for jwara.

- Gulvel satva 125 mg. T.D.S. with honey.
- Tribhuvana keerti Ras 125 m.g. T.D.S. with honey.
- Mruthyunjaya Rasa 125 mg. T.D.S. with honey.
- Mahasudarshan ghanvati 125 mg. T.D.S. with honey.
  If child is having fever with Diarrhoea and Dysentry should be given:
- Sanjeevini vati 125 mg. T.D.S. with honey.

Along with kutajarista or jeerakadyarista dose of 5 ml. T.D.S. mixed with water.

PARALYTIC STAGE :

In this stage, complete rest should be given and the should be kept with adequate supports for affected limbs with the help of soft pillows and pads. Proper nursing should be given ghna treatment should be continued till temperature relieves completely.

As soon as the temperature come down the patient will get good appetite and passes stools regularly and restlesness, tenderness in the limbs will be disappear and patient looks fresh.

POST -PARALYTIC STAGE :

After temperature comes down the management is all follows up to 8 days :

- Leuk warm medicated oil should be applied gently to whole with mahanarayana tail, bala tail or ksheerbala tail etc.
- Bramhmi oil or ksheera bala oil can be applied on head and keep oil swab over head.
- Fomentation should be avoided.
- If fever is not relapsed the following oral medicine should be kept.
- Vata vidwamsa ras or Brihat vata vidwamsa ras 125 mg. T.D.S. with honey.
- Bramhi vati or bramhi vati with gold 125 mg T.D.S. with honey.
- Aswagandhaista or Dashmoolarista 2 to 5ml. T.D.S. with water.
- Shatavari churn or shatavari kalpa or shatavari ghrita ½ spoon T.D.S. with milk.

MODERN LINE OF TREATMENT :

In the earlier times, when the epidemics of polio were frequent, there was absolute lack of knowledge regarding the management aspects of this crippling disease. Acute cases required immediate relief from pain, and rehabilitation was a challenge for chronic cases with deformities. Various strategies to manage these cases were in vogue at that time. A lot of experimentation was also involved. One of the earliest descriptions regarding management strategies of polio is the heroic work of Sister Elizabeth Kenny (an Australian nurse). She used hot packs to relieve muscle spasms in early stages of the disease and discouraged the practice of prolonged immobilization of affected limbs. A large number of patients were benefited.

The first modern rehabilitation center dedicated to patients with polio was set in 1926 by President Franklin Theodore Roosevelt in the United States.

Later, new inventions were introduced to offer relief to the sick patients. One such instrument was the Iron Lung Machine. It was used in patients with respiratory paralysis to prolong their lives by assisted respiration. The drawbacks were the mammoth size, technical adjustments, and cost factor.

Modern medicine has contributed tremendously to the management of polio. In the recovery stage,remedial exercises are prescribed to assist the paralyzed muscles. Appropriate orthotic devices have been designed to prevent deformities due to muscle imbalance Various sessions of intense physiotherapy are necessary for rehabilitation and recovery. Surgical management includes tendon transplant, contracture relieving surgeries, and joint replacement surgeries. Illizarov technique, an orthopedic technique used to stabilize and rehabilitate the limb has also been now increasingly used for correction of deformities.

PREVENTION :

1. **Passive immunization:** In 1950, William Hammon at the University of Pittsburgh purified the gamma globulin component of the blood plasma of polio survivors. Hammon proposed the gamma globulin, which contained antibodies to poliovirus, could be used to halt poliovirus infection, prevent disease, and reduce the severity of disease

in other patients who had contracted polio. The results of a large clinical trialwere promising; the gamma globulin was shown to be about 80% effective in preventing the development of paralytic poliomyelitis. It was also shown to reduce the severity of the disease in patients who developed polio. The gamma globulin approach was later deemed impractical for widespread use, however, due in large part to the limited supply of blood plasma, so the medical community turned its focus to the development of a polio vaccine .

2. **Vaccine:** Two types of vaccine are used throughout the world to combat polio. Both types induce immunity to polio, efficiently blocking person-to-person transmission of wild poliovirus, thereby protecting both individual vaccine recipients and the wider community (so-called herd immunity) [42]. The first candidate polio vaccine, based on one serotype of a live but attenuated (weakened) virus, was developed by the virologist Hilary Koprowski. Koprowski's prototype vaccine was given to an eight-year-old boy on February 27, 1950. Koprowski continued to work on the vaccine throughout the 1950s, leading to large-scale trials in the then Belgian Congo and the vaccination of seven million children in Poland against serotypes PV1 and PV3 between 1958 and 1960 The second inactivated virus vaccine was developed in 1952 by Jonas Salk at the University of Pittsburgh, and announced to the world on April 12, 1955. The Salk vaccine, or inactivated poliovirus vaccine (IPV), is based on poliovirus grown in a type of monkey kidney tissue culture (vero cell line), which is chemically inactivated with formalin. After two doses of IPV (given by injection), 90% or more of individuals develop protective antibody to all three serotypes of poliovirus, and at least 99% are immune to poliovirus following three doses Subsequently, Albert Sabin developed another live, oral polio vaccine (OPV). It was produced by the repeated passage of the virus through nonhuman cells at sub physiological temperatures. The attenuated poliovirus in the Sabin vaccine replicates very efficiently in the gut, the primary site of wild poliovirus infection and replication, but the vaccine strain is unable to replicate efficiently within nervous system tissue. A single dose of Sabin's oral polio vaccine produces immunity to all three poliovirus serotypes in about 50% of recipients.

Three doses of live-attenuated OPV produce protective antibody to all three poliovirus types in more than 95% of recipients. Human trials of Sabin's vaccine began in 1957, and in 1958 it was selected, in competition with the live vaccines of Koprowski and other researchers, by the US National Institutes of Health. Licensed in 1962, it rapidly became the only polio vaccine used worldwide.

NATIONAL IMMUNISATION PROGRAM (NIP) :

Children: Children are recommended a primary course of 3 doses of an IPV-containing vaccine at 2, 4 and 6 months of age and a booster dose at 4 years of age. The recommended interval between 2 doses is 2 months, but, for catch-up, the minimum interval can be 1 month. In the Australian setting, a 3-dose primary schedule and a booster at 4 years of age provides adequate protection. Therefore, for those children who have received a complete course of polio vaccine during childhood, a further booster dose is not required later in life unless they are at increased risk of infection as below.

Adults: The schedule for unvaccinated adults is 3 doses administered at intervals of 1–2 months

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Booster doses: A booster dose is not required for fully vaccinated children or adults unless they are at increased risk of infection, such as travelling to areas or countries where poliomyelitis is epidemic or endemic healthcare workers, including laboratory workers, in possible contact with poliomyelitis cases. For those exposed to a continuing risk of infection, booster doses are desirable every 10 years. There is no cure for polio. The focus of modern treatment has been on providing relief of symptoms, speeding recovery and preventing complications. Supportive measures include antibiotics to prevent infections in weakened muscles, analgesics for pain, moderate exercise and a nutritious diet. Treatment of polio often requires long-term rehabilitation, including physical therapy, braces, corrective shoes and, in some cases, orthopedic surgery . Portable ventilators may be required to support breathing. Historically, a non-invasive, negative-pressure ventilator, more commonly called an iron lung, was used to artificially maintain respiration during an acute polio infection until a person could breathe independently (generally about one to two weeks). Today, many polio survivors with permanent respiratory paralysis use modern jacket-type negative-pressure ventilators worn over the chest and abdomen .

Other historical treatments for polio include hydrotherapy, electrotherapy, massage and passive motion exercises, and surgical treatments, such as tendon lengthening and nerve grafting. Devices such as rigid braces and body casts-which tended to cause muscle atrophy due to the limited movement of the user-were also touted as effective treatments .

DISCUSSION:

In several large series late functional deterioration has been associated with clear medical or surgical factors. Using conventional definitions these patients could not be considered to have post-polio syndrome. Rather the severe physical stresses of post-polio disability leads to the development of progressive orthopaedic, respiratory, orthopaedic and general medical abnormalities, often exacerbated by intercurrent events. These abnormalities may often present with atypical clincal features because of the extent of underlying atrophy and weakness. Many of these abnormalities are potentially treatable and it is therefore necessary to urge caution before attributing functional deterioration to the post-polio syndrome or progressive post-polio muscular atrophy.

CONCLUSION:

The above review revels that rehabilitation in patients with post-polio syndrome should take a multi professional and multidisciplinary approach, with an emphasis on physiotherapy, including enhanced or individually modified physical activity, and muscle training. Patients with post-polio syndrome should be advised to avoid both inactivity and over use of weak muscles. Evaluation of the need for orthoses and assistive devices is often required.

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