

POLIOMYELITIS AND ITS MANAGEMENT IN THE HOSPITAL OF STARA GORA, SLOVENIA

In memoriam Dr Hilda Veličkov

POLIOMIJELITIS I NJEGOVO LIJEČENJE U BOLNICI STARA GORA, SLOVENIJA

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SUMMARY

In the years between 1956 – 1958 Slovenia faced a poliomyelitis epidemic in which around 400 people were affected, one tenth of them died, and a big part of the population was left with consequences of this disease and its long-lasting rehabilitation. From 1952 to 1962 the facility of Stara Gora offered shelter and physical rehabilitation with up-to-date treatments such as oscillation and minimal joint mobilisation, hydrotherapy, irradiation, and electrical stimulation to 1124 children. During this period 200 children suffering from poliomyelitis were admitted to a specialized ward. This number represented 18% of overall admissions, second only to congenital hip displacement. In 1957 a non-mandatory vaccination program started, which eventually became mandatory in 1964. The consequences of the poliomyelitis epidemic were very serious: 199 out of the 200 admissions were in need of medical rehabilitation. These patients had one of the longest average hospitalization times (376 days) and one of the lowest percentages of independent daily life activities after hospitalization (94 children out of 200, or 47%). Normally, the rehabilitation would start with hydrotherapy in warm water or irradiation with IR rays and progress to the ultimate treatment, electrical stimulation and walking exercises in front of a mirror to correct the posture and the limb movements.

Key words: Poliomyelitis; history of medicine; rehabilitation; infectious diseases; vaccines; Slovenia.

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INTRODUCTION

Nowadays, more and more people refuse vaccination. Due to the unstable political situation in some parts of the world (Syria, Ukraine, etc.) we are witnessing several crisis foci, where people no longer have an access to organized vaccination. In such circumstances, and by insufficient vaccination coverage, infectious diseases are becoming an increasing threat for the rest of the world.¹

One of the diseases that can be prevented by vaccination is poliomyelitis. In the not so distant past, between 1948 and 1962, Slovenia witnessed a few major epidemics, but due to vaccination the number of cases decreased significantly. The so-called Bolnica za predšolsko invalidno mladino (Hospital for pre-school disabled youth) in Stara Gora had one of the key roles in the treatment of poliomyelitis in our region. In the years between 1952 and 1962, on a beautiful sunny location above Nova Gorica, the treatment of 200 infants, on whom poliomyelitis left serious consequences, took place.

The following review aims to awaken the memory of those times and to remember, why we vaccinate.

ABOUT POLIOMYELITIS

Polio is a contagious viral disease caused by the poliovirus, which is an RNA virus with three serotypes (P₁, P₂, P₃). Most cases of infection are carried asymptotically. When the virus affects the nervous system and causes paralysis, we call it poliomyelitis. This word derives from the Greek word polio - grey and myelon - marrow and refers to the inflammation of the spinal cord caused by the polio virus.² The disease normally occurs in paediatric ages, but it can also occur in susceptible adults. The course of disease in adulthood is usually more severe than in children. Humans are the only reservoir for the very infective virus, which is mostly transmitted by saliva and faeces. The incubation rate is 3 – 35 days. Around 25% of cases manifest with a mild and non-specific form of the disease (sore throat and fever, nausea, vomiting, abdominal stomach pain, rarely diarrhoea, and flu-like disease) without affecting the CNS. However, less than one percent of patients, infected with the poliovirus, develop the paralytic form of the disease.^{3,4} The paresis occurs 1-10 days after the onset of the prodromal signs. At the same time patients can experience severe muscle pain and spasms in the limbs and in the back. Initially hyperreflexia can be appreciated, which turns into a loose, usually asymmetric, palsy with weakened tendon reflexes. Paralysis

worsens in the following 2-3 days along with the duration of fever. After that, it reaches a plateau which can last from a few days to several weeks. Then muscular strength is slowly regained. However, a paresis that lasts for more than 12 months after the onset of disease is usually permanent.

Unfortunately, there is no specific treatment for poliomyelitis. The therapy is supportive: at the onset of symptoms with pain relief, and artificial ventilation in progressed stage of the disease with respiratory failure. A good physiotherapy treatment is necessary. The most effective way of prevention is to maintain high vaccination coverage in the community.

Nowadays, there are still on-going global programs to eradicate poliomyelitis. In 2014 there were a total of 356 cases in nine countries: Pakistan (303 cases), Afghanistan (28 cases), Nigeria (6 cases), Equatorial Guinea (5 cases), Somalia (5 cases), Cameroon (5 cases), Iraq (2 cases), Syria (1 case) and Ethiopia (1 case).^{5,6} The likelihood of disease outbreaks is highest in unvaccinated communities with poor sanitary conditions. Europe is currently a polio-free zone. The last polio case was detected in 2001 in Bulgaria, however the nearest major eruption in 2010 happened in Tajikistan: 460 people got sick with the virus WPV1 from Pakistan.^{7,8} This case also shows that no country is completely safe from poliomyelitis until we reach the global eradication of the virus. Several programs for the eradication of poliomyelitis are nowadays still on-going with the target to achieve the highest vaccination coverage of population worldwide.⁹

HISTORY OF THE HOSPITAL OF STARA GORA, SLOVENIA

TIMELINE

The treatment of poliomyelitis in Stara Gora, Slovenia began on 24 April 1952, when 32 children of the pre-school age, suffering from cerebral palsy, hip disease, rickets, and some of them recovering from poliomyelitis, moved with part of the staff from the castle of Vransko to the facility in Stara Gora. The young patients needed comprehensive treatment and the main mission of the newly established institution in Stara Gora was to undertake a program of rehabilitation from the very first day of its existence.

In the ten-year period, from 1952 to 1962, the hospital in Stara Gora admitted 1,124 children with handicaps and provided despite circumstances the best possible care. The hospital grew and developed over the years. Thus, both the number of beds (in 1952 70, from 1953 to 1954 120, in 1955 147, in 1956

170, and the maximum was reached in 1962 with a total of 180 beds) and the number of medical staff (from 10 in 1952 to 40 in 1956 and 137 in 1962), increased.

The hospital became completely independent in 1956, when the Hospital for osteoarticular tuberculosis was divided into the General Hospital in Šempeter, the hospital Valdoltra that admitted orthopaedic patients and the hospital in Stara Gora. An independence was a big challenge for the newly established hospital, because it was supposed to be equipped with all the essential elements such as X-ray and laboratory, and of course with all the infrastructure, such as water, electricity, and telephone lines.

A period of great and profound changes in the structure and organization of the hospital followed. In the early 70s, the new criteria for in-hospital treatment of children were adopted, the introduction of neurophysiotherapy (with Bobath and Vojta's method) took place, the construction of a pavilion system was started, and the hospital reunited with the General hospital of Šempeter.

THE MAIN CHARACTERS

At the very beginning, the hospital was led by a nurse, Mrs. Mara Wardo alone, with the technical assistance of Professor Franc Derganc jr., who came weekly to do rounds as an orthopaedic surgeon, with the help of Dr Zdravljich, a paediatrician, who was coming to the hospital three times a week, and finally with the help of the psychologist, Professor Miran Čuk.

In 1962, Dr Koršič made some radical changes in the hospital organisation: he set the first four permanent doctors, and opened the operating room, where children with orthopaedic disorders as well as children with cerebral palsy were operated on twice a week. This was also the period of training doctors from other parts of Slovenia and abroad (for example, some of them came from Italy), who were able to learn the operational approaches in children with cerebral palsy, under the supervision of Dr Koršič first, and later of Dr Plahuta.

THE MANAGEMENT OF POLIOMYELITIS

An important chapter in the history of the hospital in Stara Gora was the treatment of poliomyelitis. In order to better understand how this disease was epidemiologically important, let us have a look at some of the data shown below (Tables 1 – 2). In the years 1952-1962, the department of poliomyelitis admitted 200 children who suffered from poliomyelitis, which is

approximately 18% of all admitted patients in the ten-year period. A similar percentage was represented by cerebral motoric disabled children, whereas a major proportion, 23% of all admitted, was represented by children with congenital hip dislocation only. Furthermore, we can see how the number of yearly admitted patients who suffered from poliomyelitis remained relatively high compared to the admissions due to other diseases. However, this trend started to decline after 1957, when vaccination was introduced in Slovenia as well.

Table I. The number of admitted patients at Stara Gora between 1952 and 1962 for different conditions and diseases. The total number of patients with poliomyelitis is 1124, which represents approximately 18% of the total number of admissions. Taken from Derganc F et al. Bolnica za predšolsko invalidno mladino Stara Gora 1952 – 1962. Nova Gorica: Bolnica za predšolsko invalidno mladino Stara Gora, 1962.

| Disease | Year | | | | | | | | | | Total |
|--|------|------|------|------|------|------|------|------|------|------|-------|
| | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | |
| Congenital hip dislocation | 4 | 4 | 15 | 25 | 43 | 28 | 38 | 36 | 32 | 32 | 257 |
| Equinovarus foot | 3 | 2 | 8 | 9 | 4 | 2 | 7 | 6 | 3 | 1 | 45 |
| Poliomyelitis | 8 | 34 | 29 | 14 | 35 | 37 | 17 | 7 | 8 | 11 | 200 |
| Cerebral palsy | 22 | 13 | 17 | 23 | 28 | 15 | 21 | 29 | 15 | 20 | 203 |
| Rickets | 6 | 10 | 21 | 26 | 32 | 14 | 24 | 22 | 19 | 24 | 198 |
| Scoliosis | 6 | 7 | 6 | 9 | 4 | 4 | 8 | 4 | 4 | 3 | 55 |
| Perthes disease | 7 | 4 | 10 | 8 | 7 | 8 | 6 | 6 | 6 | 9 | 59 |
| Other diseases of musculoskeletal system | 5 | 1 | 8 | 3 | 6 | 5 | 13 | 19 | 16 | 19 | 97 |
| TOTAL | 61 | 75 | 114 | 117 | 159 | 113 | 134 | 129 | 103 | 119 | 1124 |

The second table shows how serious were the consequences for the children who overcame poliomyelitis: Of the 200 admitted in hospital, 199 of them needed medical rehabilitation.

Table 2. The number of patients admitted between 1952 and 1962, 199 of the total 200 required some kind of rehabilitation. Taken from Derganc F et al. Bolnica za predšolsko invalidno mladino Stara Gora 1952 – 1962. Nova Gorica: Bolnica za predšolsko invalidno mladino Stara Gora, 1962.

| Year | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | Tot. |
|---|------|------|------|------|------|------|------|------|------|------|------|
| Admitted patients | 8 | 34 | 29 | 14 | 35 | 37 | 17 | 7 | 8 | 11 | 200 |
| Patients in need of medical rehabilitation | 8 | 34 | 29 | 14 | 34 | 37 | 17 | 7 | 8 | 11 | 199 |
| Patients in need of professional rehabilitation | 2 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 9 |
| Patients suitable for independent life without restrictions | 0 | 16 | 7 | 6 | 8 | 16 | 5 | 3 | 3 | 2 | 66 |
| Patients suitable for independent life with restrictions | 6 | 16 | 22 | 6 | 26 | 21 | 11 | 4 | 5 | 9 | 126 |
| Patients suitable for sheltered workshop | 2 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 7 |
| Patients suitable for asylum | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

From the data on hospitalizations in Stara Gora's hospital we can also conclude that poliomyelitis is a disease with one of the highest average periods of hospitalization (376 days), and it has one of the highest percentages of limited self-reliant ability after hospitalization, with a total of 63% admitted patients (126 out of 200 affected).

The first and also the main tasks of the medical staff were to fight pain and the irregular position of arms, legs and chest of the admitted children who suffered from poliomyelitis. The treatment continued with oscillations or with minimal movement of joints that both resulted in a better blood circulation within muscles. As a rule, the rehabilitation started with hydrotherapy, for the implementation of which two Hubbard bathtubs, one walking bathtub and an outdoor swimming pool were available. The children, who were too weak and did not tolerate the hot baths, underwent radiation with infrared rays.

Another technique that also had excellent results was the electrical stimulation of the paretic muscles. In the gym (Fig. 1), walking was exercised on



Figure 1 - Physiotherapy of the children in the gym of the hospital of Stara Gora.



Figure 2 - The Stara Gora carriage.

rubber cushions, which prevented from sliding and in front of the mirror, which allowed a better control of movement. An important event for the young patients occurred when the plaster splints were replaced with orthopaedic appliances that took over the function of a permanent paralytic muscle group. However, these appliances were not required for each child, because often the final outcome of therapy would be a complete or almost complete restitution of the musculature function. A typical appliance was the Stara Gora carriage (Fig. 2).¹⁰

THE EYES OF A WITNESS

AN INTERVIEW WITH THE NURSE KLAVDIJA ZORN

In order to better understand how the rehabilitation of children who suffered from poliomyelitis was carried out, I interviewed Klavdija Zorn, a retired nurse, who during the years 1955-1991 worked at the Department of poliomyelitis in the Hospital for preschool disabled youth in Stara Gora, Slovenia.

Who were the patients of the medical institution in Stara Gora?

They were children aged up to 7 who were treated in our hospital as a result of the consequences of poliomyelitis and other diseases. I worked in the Department for poliomyelitis. Our young patients were admitted as soon as they were no longer contagious and had already strongly developed paralyses.

How crowded was the ward?

I remember how during the first year of our work in Stara Gora we admitted 8 children of a preschool age from the Clinic for infectious diseases in Ljubljana. In the later years, the trend increased. You know, back then, the hospitalization in the Hospital for pre-school disabled youth in Stara Gora was the only option for in-hospital treatment of poliomyelitis for preschool children in the whole Yugoslavia, along with the Intensive therapy unit of the Clinic for infectious diseases in Ljubljana. Most of our young patients came from Bosnia and Croatia, and the Hospital itself had a lot of support from the government.

How did a typical day at the ward look like? What were the difficulties that troubled the children?

In the morning the alarm clock was set at six. Bathing and breakfast were followed by a program of education, physiotherapy and hydrotherapy.

During activities the children were mostly outside and enjoyed the beautiful weather. Despite handicaps and various motoric problems, the children enjoyed the atmosphere in the institution, so that they were attending physiotherapy even at the stage of pain. A positive envy dominated among them: they used to compare with each other and those who had better results were sort of an example for the others.

Was children's life difficult due to the handicaps?

Certainly it was not easy! Our first and main task, when we admitted the little ones, was treating pain and the pathological positioning of arms, legs, and chest. We treated pain with hot compresses, by placing them on painful joints and muscles 3-4 times a day for 15 minutes. All paralytic arms, legs and chests were immobilized with orthopaedic casts in the correct positions to avoid contractures. Far more difficult, I must tell you, was treating those children, who already developed a contracture.

What happened when the pain stage was over?

Well, then, we began with minimal oscillations and movements of the joints. In this way we achieved a better circulation of blood within the muscles. Then, after one or two months, when we no longer expected aggravation of palsy, the main part of the therapy was overtaken by the physiotherapist. First, she had to determine the muscular status, in specific the clinical and electrical condition of the muscles. Determining this status was difficult but very important task: an individual tailored therapy would begin from this point on. Determining the muscular status was used also in the following treatment to monitor the success of recovery. Later on, the therapy continued with hydrotherapy, since it proved to be the best way of physiotherapy, as it takes part of the weight from a body that is immersed in water. Thus, limb motions that were impossible on ground were implemented in the bathtubs. This made children enjoy further therapy. For hydrotherapy only, we had two Hubbard bathtubs and the third, which was more elongated, was designed for those children who had been initiated with the first steps. On sunny and warm days hydrotherapy took place in the outdoor pool. I also remember that we radiated with infrared rays those children who did not well tolerate hot baths. Moreover, we also used the electric current in terms of electromassage with which we achieved very good results. Unfortunately such method was not suitable for all the young patients. Once the children dominated the movements against a load, an important shift happened. We

then started practicing how to cope with the limbs' weight and finally how to work against resistance. This was already a step of walking.

How did the rehabilitation look like?

Our children were able to exercise against resistance in the renovated gym, where there was a mirror, so that the exercises could be self-controlled. Again and again I was surprised to notice that usually the child itself felt when it was the right time to start walking alone, without the need to be forced. We started the exercises by firstly securing the weakened muscles with an orthopaedic cast. At the very beginning of the rehabilitation it was necessary to hold the children firmly and help them moving their limbs. With daily exercises, the children made rapid progress and soon started to walk on their own, which of course was a pleasure for us. This process could take over a year, but luckily there were very few children whose rehabilitation wouldn't give the expected results. Such patients had paralysis of both upper and lower extremities.

Was the rehabilitation of these children meant to be hopeless?

Not at all. The function of the weakened muscles was replaced with orthopaedic appliances. Once a child learned how to individually manage these appliances, he could be moved into home care. Conservative treatment was not always successful, so some children still had to undergo surgery. This was the last call for them to be able to live and work in the society.

AN INTERVIEW WITH DR HILDA VELIČKOV

This last part is dedicated to Dr Hilda Veličkov, a local paediatrician, who has sadly passed away recently, leaving behind her an enormous amount of work done in treating the youngest patients. Her ideas about infectious diseases and the importance of immunity against them through vaccines are definitely worth spreading.

When did you first encounter poliomyelitis?

I still remember how a friend from a childhood had severe paresis of the right upper limb, as a result of suffering from polio. The function of her limb was so affected that she was having a hard time to carry out any kind of work at all. Fortunately for her, she had such a strong attitude and did not let the disease defeat her. She rather became left-handed. Even though she was handicapped, she never got excluded or emarginated from society. My friend managed to find different jobs and be always employed. She never

married, though, but her character was so strong, she would never close to the world. In the institution where she studied, she had no aids for her disability. Neither did the government support her financially or in any other way. Although she remained paralyzed, my friend had developed an even greater consciousness than those who did not have to establish and prove themselves to society.

What do you think about movements against vaccination?

I think that people, who prevent their children from being vaccinated, obviously do not know enough about the threat of epidemics. Before deciding not to vaccinate their children, they should take into consideration that there are other children in this world, who cannot be vaccinated due to fever, reduced immunity, allergy to the vaccine, etc. and therefore at much greater risk, if the common immunization coverage is insufficient. Such behaviour on behalf of the parents seems very cruel to me. I also think that the public interprets the link between autism and vaccination wrongly: there is no comparison between the damage that would occur as a result of epidemics and the very rare side-effect of vaccination alone. In this respect, I should still say that I do not know a paediatrician who would not care to maximize the immunization of their patients.

Do you think that the average Slovenian citizen knows enough about infectious diseases and vaccines?

I think the problem is that people do not read scientific articles. A sensational example is diphtheria, against which vaccination began in 1937 and since then the disease is extremely rare. But back then, children were massively dying! A similar example is smallpox: whole cities were disappearing! People should be aware of this and strive to maximize vaccination coverage, not to keep it as small as possible - a lot of effort has been invested in the prevention of epidemics. It would be foolish to have to deal with this danger again, simply because of human ignorance.

What do you think is physicians' role in the promotion of vaccination?

I think both physicians and medical students must work as much as possible to inform people about diseases caused by infections against which we can nowadays get immunization and thus be protected from. We should talk both about the negative and the positive aspects of vaccination. Therefore, we should talk about the encephalitis as a result of an infection with measles, and smallpox could be quoted as an example of the success of vaccination.

What is the final message you would like to give to our readers? What would you tell parents that decline vaccines for their children or to those who are still in doubt?

I would like to see that these people think about how many people died from epidemics of infectious diseases in the past. Moreover, they should consider about the harmful effect on those children who cannot be vaccinated, even if their parents want to vaccinate them! Those people have to understand that other children will die simply because of their egoism. In all this, there is another major problem, namely the problem of the debate about the usefulness of vaccination in the media, which usually turns into a measurement of power rather than a constructive evidence-based discussion. At the same time young doctors and medical students will have to put an even harder effort, in order to overcome the sea of unconstructive and nonsense arguments against vaccination.

CONCLUSIONS

The credible data of the poliomyelitis epidemic among Slovenes are addressing the severity of such disease. A huge number of 400 affected people, of whom one tenth died, are showing us that vaccinating and keeping a high vaccination rate are reliable ways of preventing poliomyelitis and other infectious diseases. The discussed data of the rehabilitation centre in Stara Gora are proving that precisely poliomyelitis, compared to hip displacement and similar diseases, is responsible for the most long-lasting consequences of the disease and requires very demanding conservative or operative treatment. Such considerations lead me to the conclusion that the position of many vaccine opponents is to be considered wrong and harmful to a society that managed to control the spreading of such infectious diseases as poliomyelitis in the past.

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SAŽETAK

POLIOMIJELITIS I NJEGOVO LIJEČENJE U BOLNICI STARA GORA, SLOVENIJA

U godinama između 1956. i 1958. Slovenija se suočila s epidemijom poliomijelitisa koja je pogodila oko 400 ljudi, od kojih je jedna desetina umrla, a velik dio populacije ostao je s posljedicama ove bolesti i dugotrajnom rehabilitacijom. Od 1952. do 1962. objekt Stara Gora ponudio je zaštitu i fizikalnu rehabilitaciju uz suvremene tretmane kao što su oscilacija i minimalna mobilizacija zglobova, hidroterapija, iradijacija i električna stimulacija za 1124 djeteta. U tom je razdoblju 200 djece oboljelih od poliomijelitisa bilo primljeno na specijalizirani odjel. Ovaj broj je predstavljao 18% cjelokupnog prijema pacijenata, odmah iza kongenitalnog pomaka kuka. Godine 1957. započeo je neobvezujući program cijepljenja, koji je konačno postao obvezan 1964. Posljedice epidemije poliomijelitisa bile su vrlo ozbiljne: od 200 primljenih pacijenata, za njih 199 bila je potrebna medicinska rehabilitacija. Ovi pacijenti imali su jednu od najdužih prosječnih hospitalizacija (376 dana) i jedan od najnižih postotaka samostalnih svakodnevnih aktivnosti nakon hospitalizacije (94 djeteta od 200 ili 47%). Rehabilitacija obično započinje hidroterapijom u toploj vodi ili iradijacijom IR zrcala i napreduje do krajnjeg liječenja, električnom stimulacijom i vježbom hodanja ispred zrcala radi ispravljanja držanja i pokreta udova.

Ključne riječi: poliomijelitis; povijest medicine; rehabilitacija; zarazne bolesti; cjepiva; Slovenija.