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## Original research article

# Post-polio syndrome. Cases report and review of literature

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## ABSTRACT

It is estimated that around 15 million people survived polio infection worldwide since early twentieth century. In 1950 effective vaccination was used for first time. Since that time number of affected people decreased. The last epidemic of Haine–Medine disease in Poland was in 1950s. Another rare cases of infections were observed till 1970s. About at least 15 years after polio virus infection, slowly progressive muscle limbs paresis with muscle atrophy, joints pain, paresthesia were observed in polio survivors. That constellation of symptoms was called post-polio syndrome (PPS). PPS frequency among people after paralytic and nonparalytic polio infectious is ranged from 30% to 80%. Fatigue that leads to physical and mental activity deterioration is another important symptom that is observed in 90% of patients with PPS. Etiology of disease remains elusive. Probably it is an effect of spine frontal horns motoneurons damage during acute virus polio infection that leads to overloading and degeneration of remaining ones. The most important risk factors of PPS are female sex and respiratory symptoms during acute polio infection. Electromyography is an important part of PPS diagnostic process. Electrophysiological abnormalities are seen in clinically affected and unaffected muscles. The most frequent are fasciculations and fibrillations during rest activity, extension of motor unit area, time duration and amplitude. In this study we described three cases of people who developed PPS years after Haine–Medine disease and correlation between their EMG results and clinical status. We also analyzed electromyography results both after one month since first PPS signs occurred as well as after few years. Presentation of dynamic changes in EMG was the most important aim of that study.

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Photo 1 – Patient number 1.

## 1. Case 1

Sixty-two years old male with hypertension who underwent polio virus infection at age of six years developed at time of disease weakness and atrophy of right lower limb muscles. After infection he was able to walk unassisted and his nervous system progressed quite normally. After 39 years from recovery new neurological symptoms occurred. He complained at intensification of muscles atrophy with accompanying pain and numbness (Photo 1). Symptoms were more intensive during winter and after longer physical activity. Patient claimed that neurological deterioration occurred when he started to work as a postman and partially decrease after buying a car and use it to deliver letters. He also complained at



Photo 2 – Patient number 2.

problems with sleeping and concentration, general weakness. Patient has gone to neurologist after four years since that new neurological status deterioration. Blood tests and magnetic resonance (MR) of brain were normal. Electroneurography (ENG) and electromyography (EMG) were done. ENG was normal. EMG study in clinically affected muscles of right leg revealed features of neurogenic dysfunction, significant extension of amplitude, time duration and motor unit area. Signs of chronic denervation were also observed in left leg muscles. Maximal voluntary activity was diminished and single fasciculations and fibrillations were observed during rest activity in muscles (Table 1).

## 2. Case 2

Sixty-years old male with hypertension and digestive heart failure was admitted to neurology department because of progressive weakness and atrophy of right limbs muscles. Symptoms started month earlier. At age of two years he suffered from polio infection. As a result of this, he had right limbs paresis and muscle atrophy (Photos 2–4). During all this years neurological condition was stable. He was able to work with the use of right hand and to walk on crutches. After admission to hospital his neurological state was bad. He had right limbs paresis with severe, he was able to perform only small movements with the hand, could not walk and use a wheel chair. He was depressed and had problems with sleeping. Computer Tomography (CT) of brain did not reveal any abnormalities. ENG study was normal. In EMG study there

**Table 1 – EMG examination of first post-polio patient.**

Clinically affected muscles	Mean amplitude uV	Mean time of duration Ms	Percentage of polyphasic potentials %	Rest activity
Right tibialis anterior muscle	2924	16.9	32.0	Fasciculations, fibrillations
Right quadriceps femoris muscle	3162	15.9	29.3	Fasciculations, fibrillations
Clinically unaffected muscles				
Right biceps	444	10.2	0	–
Left interosseus dorsalis muscle	752	9.9	0	–
Left tibialis anterior muscle	1215	12.4	6.7	Fasciculations
Left quadriceps femoris muscle	1298	12.5	6.7	Fasciculations

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