

## DYSARTHRIA AS THE ISOLATED CLINICAL SYMPTOM OF BORRELIOSIS. A CASE REPORT

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**Abstract:** This report presents a case of dysarthria due to hypoglossal nerve mono-neuropathy as the only consequence of neuroborreliosis. The 65-year-old man with a seven-months history of articulation disturbances was examined. The speech of the patient was slow and laboured. A slight weakness of the muscles of the tongue (left-side) was observed. The patient suffered from meningitis due to *Borrelia burgdorferi* infection in 1999 and initially underwent a successful antibiotic treatment. Detailed radiological investigation and psychological tests were performed and co-existing neurological diseases were excluded. To describe profile of speech abnormalities the dysarthria scale was designed based on S. J. Robertson Dysarthria Profile. There were a few disturbances found in self-assessment of speech, intelligibility, articulation, and prosody but especially in the morphology of the articulation muscles, diadochokinesis, the reflexes (in the mouth, larynx and pharynx). Needle EMG examination confirmed the diagnosis of mono-neuropathy of left hypoglossal nerve. The study confirms the fact that neuroborreliosis may evoke chronic consequences.

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### INTRODUCTION

Dysarthria is a speech disorder due to a weakness or poor coordination of the speech muscles. It is often a symptom of a disease, such as cerebral palsy, muscular dystrophy and cranial nerves abnormalities. Dysarthria can result from head injury or cranial nerves neuropathy, and from neuritis due to infections. In the case of XII cranial nerve disturbances, speech is slurred or otherwise difficult to understand due to lack of ability to produce speech sounds correctly.

In literature to date, long term effects of neuroborreliosis were often described with loss of peripheral nervous system function.

In the course of borreliosis, deficits of almost all cranial nerves have been recently described [3, 4, 6, 7, 9, 10, 11,

12, 13, 14, 15]. The isolated XII left cranial nerve (hypoglossal nerve) dysfunction, however, has never been described before. The purpose of this study was the delineation and assessment of dysarthria profile as the only neurological effect of mono-neuropathy of the XII cranial nerve in the course of neuroborreliosis.

### PATIENT

The 65-year-old patient underwent acute meningitis due to *Borrelia* infection in 1999. The diagnosis was based on the history of tick bite associated with the typical clinical presentation of the severe meningitis. Fever, meningism, and nausea were noticed. Detection of lymphocyte pleocytosis in lumbar puncture and anti-*Borrelia* antibodies in the ELISA test with the samples of

serum and CSF (intrathecal antibody production) confirmed neuroborreliosis. The patient underwent therapy with ceftriaxone 2 g/day.

During admission to the Neurological Outpatients Department of the Institute of Agricultural Medicine in December 2000, the patient suffered from dysarthria. The disturbances existed for seven months and had slight mood disturbances. Based on the neurological and neuropsychological tests, we did not notice any other symptoms or damage in the central nervous system functioning. Detailed radiological investigation and psychological tests excluded co-existing neurological diseases.

To describe the profile of speech abnormalities, the dysarthria scale was designed based on S. J. Robertson Dysarthria Profile [18].

## RESULTS

The patient himself had noticed intelligibility of speech and tiredness during speaking. Furthermore, subjective problems with respiration and weakness of voice were noticed. Motivation to speak was diminished as well as intelligibility of speech and reading. Articulation of the consonant sounds was disturbed. There were also changes in the morphology of the articulation muscles of tongue. Ability to protrude and retract tongue was diminished. Left part of tongue at rest revealed fasciculation. Besides, the ability to move the tip of the tongue into left cheek and to the left side of the mouth end was diminished as well as raising the tip of the tongue in- and out of the mouth. The elements of adiadochokinesis of tongue were visible, especially the ability to elevate and lower the tongue tip rapidly. Patient had also problems in moving the tongue from side to side and in repeating rapidly /o-i/.

In the needle EMG evaluation (tongue muscles - left side) a markedly reduced interference pattern in combination with changes in motor unit potential configuration and spontaneous enervation activity was noticed. The mentioned results confirmed the diagnosis of XII left cranial nerve lesion.

## DISCUSSION

In Europe, meningopolyradiculoneuritis (Bannwarth's syndrome) represents the most common manifestation of acute neuroborreliosis [4, 5, 6, 8].

About 60% of patients with Bannwarth's syndrome show cranial nerve palsies. These usually begin several weeks after the onset of erythema migrans [1, 12]. The most common is an involvement of the facial nerve [1, 2, 3, 4]. The second most frequently affected nerve is the vestibulocochlear nerve. Isolated involvement of this nerve as a result of *Borrelia* infection seen only in extremely rare cases [10, 15].

The optic nerve involvement (optic neuritis, disk edema), oculomotor palsies, facial sensory problems were also observed.

Lesions involving cranial nerves IX-XII were extremely rare [13, 14, 15, 16, 17].

The isolated mono-neuropathy of XII nerve in the course of neuroborreliosis have never been described before.

The syndromes such as neuropathy of the XII left cranial nerve probably reflect indirect effects due to a secondary auto-immune response to *Borrelia burgdorferi* infection [9, 19].

Clinically, when cranial or peripheral neurons are involved, there is an impairment of sensitivity. Pareses and depression of reflexes are rare. The pathogenesis of neuropathy in the course of borreliosis is still hypothetical. In most cases axonal neuropathy was noticed which was confirmed neurographically and histologically [19].

In the case of the examined patient, therapy for dysarthria focused on maximizing the function of all systems. Compensatory strategies were used. The patient was advised to take frequent pauses for breath, to over-articulate, and to pause before important words to make them stand out. The patient benefited from performing oro-facial exercises. This helped to strengthen the muscles of the tongue.

The study shows that despite initially successful therapy neuroborreliosis may often evoke chronic consequences.

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