

## Electromyographic and Clinical Evaluation of the Efficacy of Neuromobilization in Patients with Low Back Pain

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### OBJECTIVES

Evidence for the efficacy of therapeutic methods and procedures is being sought in accordance with the principles of Evidence Based Medicine. The choice of a physiotherapy method should be based on its documented efficacy.

The purpose of the investigation was to analyse changes in functional disorders of resting muscle tone following neuromobilization treatment in patients with chronic low back pain.

### MATERIAL AND METHODS

The study involved 108 outpatients treated due to low back pain and neurogenic functional pain referred to the lower extremity. The treated group was subjected to two weeks of neuromobilization-based physiotherapy. The control group received standard physiotherapy also over two weeks.

### RESULTS

The treated group demonstrated a statistically significant decrease in muscle tone in all muscles examined, clinical improvements (Lasegue test and Bragard test results), decreased pain threshold estimated with a Visual Analogue Scale (VAS).

In the control group, the only statistically significant change was a decrease in gastrocnemius muscle tone.

Tab. 1. Characteristics of parameters before and after treatment in the treated group.

parameter	before treatment	after treatment	level of differences significance (p<0,005)
	average ± standard deviation / number (present / absent)		
<b>rest muscles tension in sEMG (µV)</b>			
<u>quadratus femoris</u>	0,83 ± 1,44	0,47 ± 0,36	<b>0,0064</b>
<u>tibialis anterior</u>	1,06 ± 0,87	0,59 ± 0,48	<b>0,000006</b>
<u>biceps femoris</u>	1,65 ± 2,54	0,90 ± 1,86	<b>0,0049</b>
<u>gastrocnemius</u>	1,57 ± 4,11	0,77 ± 1,30	<b>0,0075</b>
<b>clinical tests</b>			
<u>Lasegue test (°)</u>	68,0 ± 25,7	77,1 ± 18,5	<b>0,00032</b>
<u>crossed Lasegue test (°)</u>	81,0 ± 17,3	83,8 ± 13,2	0,37 (ns)
<u>Bragard's test</u>	15/27	9/33	<b>0,041</b>
<u>reversed Lasegue test</u>	9/33	4/38	0,073 (ns)
<b>level of the neurogenic pain</b>			
VAS	4,7 ± 1,8	3,2 ± 2,1	<b>0,000014</b>

Tab. 2. Characteristics of parameters before and after treatment in the control group.

parameter	before treatment	after treatment	level of differences significance (p<0,005)
	average ± standard deviation / number (present / absent)		
<b>rest muscles tension in sEMG (µV)</b>			
<u>quadratus femoris</u>	0,59 ± 0,69	0,56 ± 0,52	0,40 (ns)
<u>tibialis anterior</u>	0,73 ± 0,87	0,98 ± 2,00	0,35 (ns)
<u>biceps femoris</u>	1,28 ± 2,98	0,92 ± 1,44	0,83 (ns)
<u>gastrocnemius</u>	1,25 ± 1,67	0,99 ± 1,83	<b>0,041</b>
<b>clinical tests</b>			
<u>Lasegue test (°)</u>	73,3 ± 28,8	75,9 ± 23,8	0,052 (ns)
<u>crossed Lasegue test (°)</u>	79,5 ± 18,6	80,5 ± 17,2	0,198 (ns)
<u>Bragard's test</u>	11/34	8/37	0,25 (ns)
<u>reversed Lasegue test</u>	8/37	7/38	1,00 (ns)
<b>level of the neurogenic pain</b>			
VAS	4,4 ± 1,8	4,2 ± 2,2	0,61 (ns)

### CONCLUSIONS

1. The results of the examinations appear to suggest that evaluation of resting muscle tone can be used to provide an objective assessment of the analgesic efficacy of physiotherapy, including neuromobilization.
2. In the treated group, neuromobilization therapy was superior to standard physiotherapy as regards eliminating or decreasing elevated resting muscle tone in response to pain in patients with low back pain.
3. Neuromobilization produced a significant improvement in clinical test results and clinical symptoms in the treated group as opposed to the control group, which demonstrates the efficacy of this therapy.
4. The results of the examinations show that tibialis anterior sEMG had the biggest diagnostic value for detecting changes in pain severity.