

EFFECTS OF NAVIGATED RTMS FOR THE HEMIPARETIC UPPER EXTREMITY MOTOR FUNKCTION IN STROKE PATIENTS – PILOT STUDY

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OBJECTIVES

The aim of our study was to assess short term of effects of repetitive Transcranial Magnetic Stimulation (rTMS) targeting ipsilesional primer motor cortex of the affected upper extremity after stroke.

METHODS

Our study was prepared between July and December of 2019, in the Neurosurgery Department, University of Pécs, Pécs, Hungary. In our study hemiparetic patients were examined who had undergone first stroke between 18 and 65 years (time after stroke was under 2 months.) Our experimental group (n=5) received high frequency rTMS treatment (intermittent theta burst stimulation) beside the neurological physiotherapy. The control-group (n=7) had Placebo-rTMS treatment along with neurological physiotherapy. Patients were evaluated before treatments (T0), after the 10 occasions of treatments (T1) and thereafter 2 weeks (T2). We investigate motor function (Fugl-Meyer Assessment Upper Extremity test-FMA) and muscle strength (Janda 0-5 method) of the hemiparetic upper extremity. Statistical analyses were used by Wilcoxon and Mann Whitney-U tests (SPSS. 28.0) the level of significance was set at p<0.05.

RESULTS

However, between the groups there were no significant differences in point of all parameters, but our experimental group showed a greater improvement than the control which is meaningful regarding the clinical relevancy. We found significant differences between groups in FMA „Shoulder-Elbow-Forearm” test in T1, experimental group points=20.8 (±2.39), control-group has 17.4 point (±2.14) (p=0.048). In T2 we found significant differences between groups too, in FMA „Hand” test (p=0.048), points of experimental group were 9.8 points (±2.94), control group had 6.8 points (±1.67). We found significant differences between groups in muscle strength of shoulder anteflexion in T1 (p=0.010), experimental group’s average muscle strength was 3.0 (±0,00), control-group=2.14 (±0.38).

CONCLUSIONS

According to our results, Intermittent Theta Burst Stimulation can be useful complementary therapy to improve upper extremity motor function and self-supporting of patients at the early rehabilitation of stroke.

		EXPERIMENTAL GROUP	CONTROL-GROUP
Sex	Male	3	4
	Female	2	3
Average age (year)		46.2	47.4
Average time from stroke (day)		14	13

Table 1.

Characteristics of the studied patients

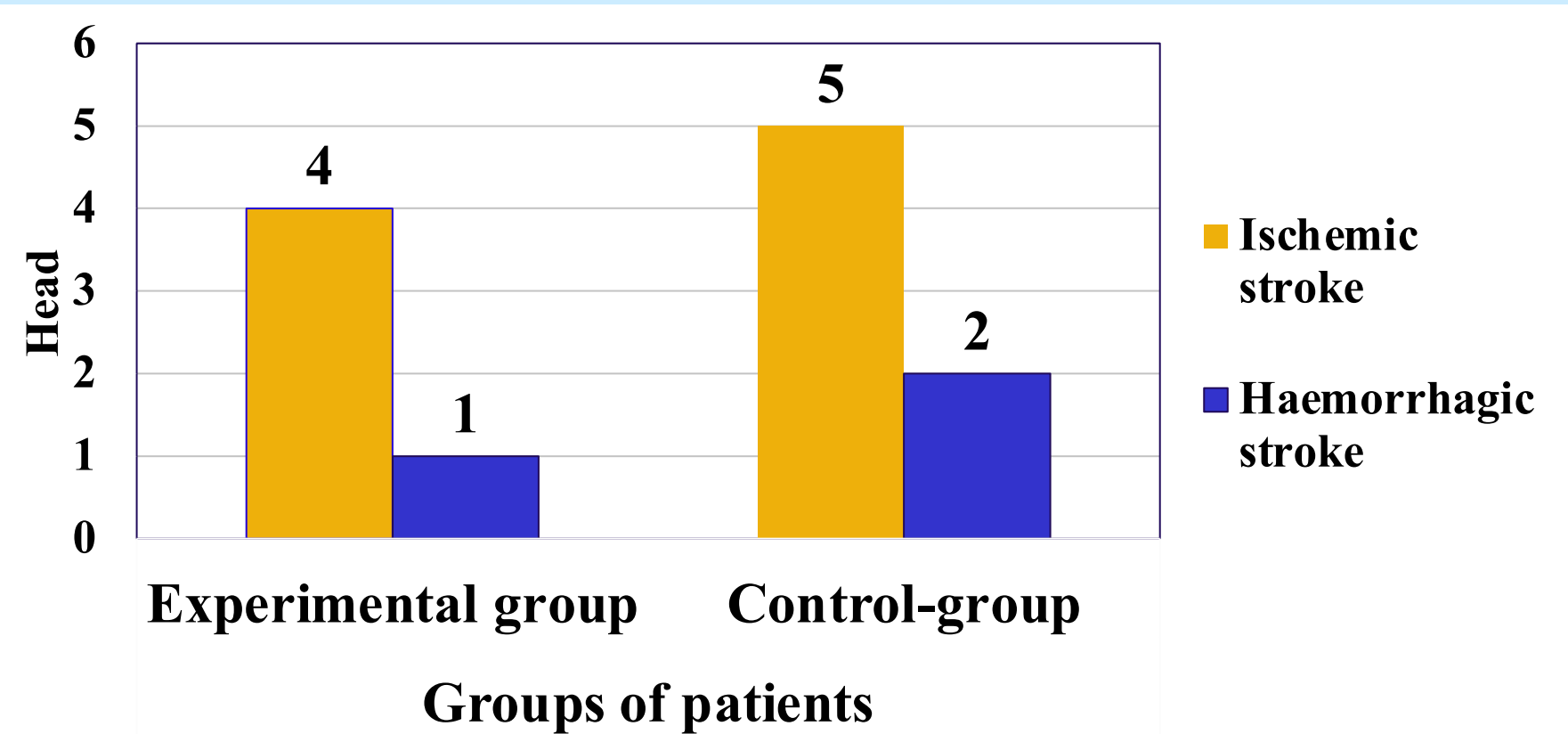


Figure 1.

Distribution of patients according to diagnosis

N=12	DIFFERENCES BETWEEN GROUPS		
FMA TEST	pT0	pT1	pT2
„Shoulder-Elbow-Forearm”	0.639	0.048	0.149
„Wrist”	0.639	0.106	0.343
„Hand”	0.755	0.432	0.048
„Coordination and celerity”	1	0.530	0.639
Complete	0.639	0.202	0.106

Table 2.

Comparison of differences between groups in FMA test

N=12		Improvement of experimental group (N=5)		Improvement of control-group (N=7)	
		Pt0-T1	Pt0-T2	Pt0-T1	Pt0-T2
Muscles of the shoulder	flexors	0.046	0.038	1.00	0.034
	extensors	0.046	0.038	1.00	0.025
	internal rotators	0.157	0.059	0.32	0.083
	external rotators	0.102	0.034	0.18	0.059
	abductors	0.046	0.038	0.32	0.046
	adductors	0.317	0.059	0.16	0.046
Muscles of the elbow	flexors	0.083	0.046	1.00	0.025
	extensors	0.317	0.046	1.00	0.317
	supinators	0.317	0.102	0.08	0.046
	pronators	0.564	0.059	0.32	0.034
Muscles of the wrist	flexors	0.157	0.025	0.32	0.083
	extensors	0.083	0.025	0.16	0.083

Table 3.

Comparison of differences between groups in muscle strenght

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