EFFECTS OF DOMINANT HAND PARALYSIS ON PERFORMING COGNITIVE TESTS IN STROKE PATIENTS

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◆ Objective

- To evaluate the degree to which the regions of brain structure or the paralysis of a dominant hand affects to perform cognitive function test in sub-acute stroke patients

◆ Method

➤ Selection of Subjects

1. Retrospectively reviewed all patients status sub-acute phase of hemiplegic stroke to transfer to the rehabilitation department
2. Study period : January 2015 - February 2016

➤ Inclusion criteria

1. Diagnosis of first onset cerebral infarction or hemorrhage
2. Ages over 44 years old due to limitation of cognitive function testing
3. Mini-Mental State Examination (MMSE) more than 20

➤ Exclusion criteria

1. Patient with left dominant hand
2. History of previous stroke
3. History of traumatic brain damage, brain tumor

➤ Clinical evaluation at admission

1. Demographic data (mean age, sex, mean education age, mean initial National Institutes of Health Stroke Scale (NIHSS), mean Fugl-Meyer Assessment (FMA) affected upper limb score, stroke type, mean initial Montreal Cognitive Assessment (MOCA))
2. Brain imaging (Computed Tomography (CT), Magnetic Resonance Imaging (MRI))
3. Cognitive function testing (Rey Complex Figure Test (RCFT), Digit Symbol Coding (DSC), Trail Making Test (TMT))

➤ Dichotomizing study group

➤ Group 1

- 52 patients whose strokes affected the dominant hand (i.e., right hemiplegia and right dominant hand)

➤ Group 2

- 79 patients whose strokes affected the non-dominant hand (i.e., left hemiplegia and right dominant hand)

➤ Group 3

- 37 patients whose strokes affected the cortical lesion

➤ Group 4

- 94 patients whose strokes affected the subcortical lesion

➤ Statistical analysis

- Descriptive statics : Mean ± Standard deviation
- Chi-squared test for categorical variables
- Independent t test for quantitative variables

◆ Conclusions

- The effect of paralysis on the dominant hand and performing cognitive tests in patients with sub-acute hemiplegic stroke was significantly different from the effect of paralysis on the dominant hand for performing TMT A and TMT B.
- The regions of the damaged brain was not significantly different from the effect of paralysis on the dominant hand.
- Likewise previous references, we found that the paralysis of a dominant hand may affect to perform cognitive function test in sub-acute stroke patients.

◆ Results

Figure 1. Flow chart to study population

Table 1. Distribution of total stroke patients according to lesion and the paralysis of a dominant hand

		Cortical damaged lesion (n=37)			Subcortical damaged lesion (n=94)		
		Lt hemiplegia (n=31)	Rt hemiplegia (n=6)	p value	Lt hemiplegia (n=48)	Rt hemiplegia (n=46)	p value
Age	Mean	65.26	65.67	0.941	66.63	64.20	0.282
	S.D.	11.00	12.01		10.39	11.31	
Sex	Male (%)	63.4	65.5	0.793	73.3	40.0	0.096
Education years	Mean	8.45	9.67	0.601	9.48	9.69	0.847
	S.D.	4.22	5.09		5.53	4.85	
Initial NIHSS	Mean	4.61	5.33	0.587	3.28	3.76	0.360
	S.D.	2.59	2.88		2.40	2.66	
FMA affected upper limb	Mean	36.52	41.50	0.711	43.70	46.50	0.597
	S.D.	2.12	29.53		22.15	22.23	
Stroke type	Ischemic type (%)	78.5	69.0	0.189	73.3	90.0	0.307
Initial MOCA	Mean	19.82	15.75	0.313	19.56	19.72	0.907
	S.D.	6.14	6.55		6.12	5.55	

Table 2. The differences of cognition function test according to the paralysis of a dominant hand

		Lt hemiplegia (n=79)	Rt hemiplegia (n=52)	p value
Ray raw	Mean	20.27	22.27	0.286
	S.D.	10.12	10.61	
Ray Z	Mean	-3.50	-3.16	0.613
	S.D.	3.59	3.89	
DSC raw	Mean	26.68	31.49	0.129
	S.D.	17.98	17.18	
DSC Z	Mean	-1.51	-1.31	0.344
	S.D.	1.18	1.13	
TMT A	Mean	58.70	42.48	0.036
	S.D.	50.74	26.69	
TMT AZ	Mean	-2.69	-1.48	0.128
	S.D.	5.21	2.80	
TMT B	Mean	143.11	103.22	0.028
	S.D.	106.55	88.99	
TMT BZ	Mean	-2.52	-1.79	0.222
	S.D.	3.19	3.35	

Table 3. The differences of cognition function test according to the regions of brain structure under the paralysis of a dominant hand

		Cortical damaged lesion (n=37)			Subcortical damaged lesion (n=94)		
		Lt hemiplegia (n=31)	Rt hemiplegia (n=6)	p value	Lt hemiplegia (n=48)	Rt hemiplegia (n=46)	p value
Ray raw	Mean	18.24	17.58	0.825	21.58	22.88	0.555
	S.D.	9.81	5.70		10.20	10.99	
Ray Z	Mean	-4.16	-5.24	0.560	-3.08	-2.89	0.807
	S.D.	3.54	4.01		3.60	3.83	
DSC raw	Mean	23.32	25.17	0.767	28.85	32.33	0.659
	S.D.	16.43	12.84		18.77	17.62	
DSC Z	Mean	-1.75	-1.63	0.701	-1.35	-1.27	0.747
	S.D.	1.03	0.61		1.25	1.18	
TMT A	Mean	68.74	50.50	0.162	52.21	41.43	0.164
	S.D.	57.85	17.86		45.03	27.61	
TMT AZ	Mean	-3.28	-1.91	0.129	-2.31	-1.42	0.352
	S.D.	4.15	1.14		5.80	2.95	
TMT B	Mean	165.42	105.40	0.107	128.71	102.98	0.206
	S.D.	108.55	60.86		103.82	92.02	
TMT BZ	Mean	-3.08	-2.10	0.422	-2.16	-1.76	0.571
	S.D.	2.84	2.26		3.38	3.47