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COGNITIVE POTENTIALS AFTER STROKE - SOMATOTHERAPY AND OCCUPATIONAL THERAPY

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ABSTRACT

Background: Focal brain lesions or more small lesions due to stroke can cause measurable damage to cognitive potential. The aim of this paper is to examine the cognitive potential in people who are suffering from a stroke, according to the outcomes of tests of cognitive potential to create and implement somatotherapy and occupational therapy, and after completion of therapy final test of cognitive potential.

Methods: A retrospective study was conducted with 64 patients who were suffering from a stroke. The subjects were recommended to somatotherapy and occupational therapy by a physiatrist. Before creating these therapies conducted initial measurement of cognitive potential MoCA test. Score 26-30 points is considered normal, while a score below 26 points indicates the presence of cognitive disorders. For those with a score less than 26 points on the initial examination of the individual created somatotherapy and occupational therapy, as well as for those with a score higher than 26 points to monitor cognitive potential. After the somatotherapy and occupational therapy for a period of 21 days, after 30 minutes during the day, measured the effects of these therapies final testing of cognitive potential MoCA test.

Result: On initial examination score <26 points was present in 92.4% of respondents, a score> 26 points was present in 7.8% of respondents, while the final test score of <26 points was present in 78.4% of respondents, while score> 26 points was present in 21.9%. The statistical significance level of p <.005 between the initial and final tests of cognitive potential MoCA test confirmed the Wilcoxon Signed Ranks test, while the statistical significance level of p <.001, confirmed Spearman's correlation coefficient.

Conclusion: This study confirmed the reliability of MoCA test at the initial and final testing the presence of cognitive impairment potential in people with stroke, and reliability is confirmed and when examining the effects of intensive use of individually created somatotherapy and occupational therapy to reduce the damage of cognitive potential. This study confirmed the positive effects of intensive use of individually created somatotherapy and occupational therapy to reduce cognitive impairment potential in people with stroke.

Keywords: stroke, resources, disorders, assessment, somatotherapy, occupational therapy

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INTRODUCTION

Depending on the source mechanism, acute stroke can be classified in two big groups. The first group includes acute ischemic stroke, which occurs in 75-80% of cases, and the second group includes acute hemorrhagic stroke which was present in the remaining 20-25% of patients [1]. According to data from the Health Statistical Yearbook, during period 2010-2014, leading cause of death was stroke as part of the group of diseases of the circulatory system [2]. Studies in the field of cognitive functions within the different sciences and occupational therapy as well, provide a wealth of data that can contribute to a better understanding of the health status and creating the conditions for improving the quality of life of people affected by stroke. Rehabilitation of stroke patients should be polyvalent, professionally well organized and economically justified process [3]. Stroke includes multiple overlapping processes, all of which aim to preserve and restore functions with the affected tissue[4]. Studies in the field of cognitive functions within the different sciences and occupational therapy provide a wealth of data that can contribute to a better understanding of the health status and creating the conditions for improving the quality of life of people affected by stroke. One of the applicable approach to the treatment of cognitive disorders after a stroke is a cognitive rehabilitation [5]. The forms of treatment that are based on neuropsychological models are called neuropsychological or cognitive rehabilitation [6]. Primary access to the neuro psychological analysis domain behavior and disclosure of his neurological correlates, trying to explain the behavioral disturbances of patients in the framework of a model of normal cognitive and cerebral functioning. This approach also provides data that serve to further the formulation of the theory of normal cognitive and organizing the brain. One of the biggest practical gain of this approach is revealed through its application in rehabilitation, since it provides for the formation of principled models of rehabilitation treatment and the basis for the design or adjustment of rehabilitation procedures specific part of the noise particular patient .

Determination of deficits, remaining and latent abilities, represents the beginning of a corrective procedure. The deficits are relatively easy to see, while determination of remaining and the latent abilities is more subtile part of work. Activation of remaining abilities and potentials is the main orientation of rehabilitation and corrective strategies [7]. Mahmutagic (2002) states that the rich portfolio of new skills, tools and intervention models put more opportunities before somatotherapist to select those that are most suitable for numerous problem areas, but also a kind of professional challenge to the exploitation of personal creative potential [8]. Tests of cognitive potential in people with stroke is done by somatotherapist or work/occupational therapist who has chosen Montreal Cognitive Assessment (MoCA test). The aim is to examine the cognitive potential in people who are suffering from a stroke. According to the outcomes of the test to create and simultaneously conduct intensive individual somatotherapy and working therapy with people who are suffering from a stroke, and then a final measure the effects of these therapies on cognitive potential in people who are suffering from a stroke.

METHODS AND MATERIALS

This study is a retrospective, clinically designed and evaluated by instruments from of the University Clinical Centre in Tuzla. The survey was conducted in the University Clinical Centre in the Department for Neurological rehabilitation, the department of spinal injury and the cabinet for occupational therapy and somatotherapy. The sample for the study included 64 patients, of both sexes, older than 18 years, who were treated and rehabilitated Center in Tuzla. Selection of respondents in the sample are as follows:

- Neuriradiologically treated subjects with ischemic and hemorrhagic stroke, the first and recurrent stroke

- Respondents with hemiplegia dominant and nondominant hand

- Respondents who have had regular medication, physiotherapy, somatotherapy and occupation therapy

From the study were excluded: respondents with heavy damage of speech, sight, hearing and the subjects in which there have been complications in the rehabilitation and respondents with lower education from 4 years of school.

METHOD

Patients were recommended by a physiatrist for somatotherapy and occupational therapy. Somatotherapist examined and classified medical record and, respecting the essential factors of therapy, estimated respondents.

INSTRUMENTS

1. Brief list of personal and hetero data/anamnesis

The test for the rapid assessment of cognition [9]. The MoCA has been suggested as a screening tool by the National Institute of Neurological Disorders and Stroke-Canadian Stroke Network Vascular Cognitive Impairment Harmonization Standards. The popularity of this test stands out among neurologists, psychiatrists, psycho/neuro linguists and others who are interested in disorders of higher cognitive function. The test was designed and built by Montreal neurologist Dr. Ziad Nasreddin 1996, and then it is completed by a group of associates Chertkowa, Phillips, Whitehead, Bergmanda, Collin, and Herbert Cummings in 2004 [10]. The test was translated into several languages. Score classification:

MoCA test consists of eight segments, each correct answer/performance/counts one point, except the memory that is not recorded and the responses of the following categories but reminders are recorded. A total score of 26 to 30 points is considered normal, with preserved cognitive potential. Score below 26 points indicates the presence of cognitive potential. It is important to snort summarizing recently added 1 point for people with lower education levels than 12 years.

SOMATOTHERAPY AND OCCUPATIONAL THERAPY

Initial testing of cognitive resources spent on the second day of hospitalization with the necessary material elements of testing, such as: table /adapted table/, chair /chair adapted/, wheelchairs, Moca test adapted to the Bosnian language, pen / pencil adapted / or other corrective aids (glasses, mite, splints, etc.). Patients with a score less than 26 points were involved in intensive and labor-somatotherapy occupational therapy. Somatotherapy and occupational therapy are backbones of neurocognitive strategy of these treatments, which are reflected in the study of cognitive resources, reducing discovered disorders and preservation of the remaining cognitive potentials. The concept of cognitive resources is an integral segment of neuropsychological concept, which covers most of the phenomenological equivalent categories that are already accepted in nosological classifications, and are basis od somatotherapy and occupational therapy. All interventions in the rehabilitation of stroke are aimed at maximum ability neuroplasticity of the brain and reconstruction through training and praxis [11]. The main component of the treatment of people with stroke are personal activities of daily living. Rehabilitation programs do not have to change the neurologic deficit, but can significantly contribute to the independence of patients [12]. The level of dependence in these activities is important to measure success of rehabilitation after stroke [13]. Somatotherapy and occupational therapy were carried out immediately after the initial evaluation, 21 days continuously, 30 minutes each day. After therapy was finished, we started final testing.

METHODS OF DATA PROCESSING

The obtained data were analyzed using the SPSS-10 for Windows statistical program. Calculated were the descriptive statistics, the mean (arithmetic mean) and standard deviation. To test the significance of differences we used Wilcoxon Signed Ranks Test. There was a significance level of 0.005%. Spearman correlation coefficients were used to investigate correlations between the observed variables.

RESULTS

The survey covered a sample of 64 patients with stroke, 84% patients with ischemic stroke, and 16%) patients with hemorrhagic stroke. We had 59.4% male, and 41% female examinees. Average age is 64.22, the youngest participant was 49 years old and the oldest is 85.

The table shows below shows the static processing of initial and final measurement MoCA test subjects with a score less than 26 points, which indicates the presence of cognitive impairment and the potential presence of cognitive impairment, with a score of 26 points and more than 26 points as considered normal soon. Tables II and III shows the initial and final statistical analysis segments MoCA test based on the estimated score for each segment of the test, except that no segment of memory your score.

Table 1: shows descriptive statistics of MoCA initial and final testings of stroke

Test	Number of Examinees	Minimal Score	Maximal score	Midle Vaule	Standard Deviation
MoCA (initial testing)	64	0	29	15.88%	8.183
MoCA (final testing)	64	4	30	18.88%	7.638

Wilcoxon Signed Ranks Test was calculated Z value is -6536 and was statistically significant ($p<.005$).

Shows corellations of initial and final examinations using MoCA test

Spearman's rho	MoCA (i)	MoCA(f)
MoCA (i)		.928**
MoCA (f)	.928**	

** $p < .001$

To calculate the correlation between the initial and final tests MoCA test we used Spearman's correlation coefficient, because dissemination of the results is not normal, any correlation is high and statistically significant.

Table 2: shows initial evaluation segments MoCA test

Segments	MoCA (initial testing) minimum number of points	MoCA (initial testing) maximum number of points	Mean	Standard Deviation	Number of Examinees
Trail test	0	1	.16	.366	64
Drawing cubes	0	1	.36	.484	64
Drawing hours	0	3	1.33	1.346	64
Appointment	0	3	2.11	1.056	64
Attention	0	2	1.34	.761	64
Reading letters,, a,,	0	1	.78	.417	64
Calculation	0	3	1.72	1.339	64
Language functions	0	2	1.34	.801	64
Fluency of speech	0	3	.44	.588	64
Abstraction concepts	0	2	1.34	.695	64
Delayed response	0	5	.78	1.266	64
Orientation	0	6	4.38	1.972	64

Table 3: Shows final evaluation segments

Segments MoCA test	MoCA (final testing) minimum number of points	MoCA (final testing) maximum number of points	Mean	Standard Deviation	Number of Examinees
Trail test	0	1	.23	.427	64
Drawing cubes	0	1	.44	.500	64
Drawing hours	0	3	1.52	1.342	64
Appointment	0	3	2.38	.917	64
Attention	0	2	1.47	.755	64
Reading letters,, a,,	0	1	.89	.315	64
Calculation	0	3	1.86	1.367	64
Language functions	0	2	1.58	.686	64
Fluency of speech	0	1	.48	.504	64
Abstraction concepts	0	2	1.55	.561	64
Delayed response	0	10	1.42	1.266	64
Orientation	0	6	4.89	1.673	64

DISSCUSION

The available literature patterns in studies that examined cognitive impairment and the potential for people who are suffering from stroke are different in terms of numbers. A sample of this study consisted of 64 patients. Of the total sample, ischemic stroke was present in 84.3% of respondents and was dominant in relation to hemorrhagic shock moždai, greater presence of ischemic stroke is present in a study by D'Alessandro et al., (2010) [14]. While the presence of hemorrhagic stroke by 15.6% was not identical to the percentage of representation in literature, but is identified with the data listed in a study carried out by Caplan, (2009) [15]. In this study, 59.37%, is the representation of male patients suffering from stroke, while 40.62% was the inclusion of female patients suffering from stroke. In a study by Lavados et al., (2007), 60% were male respondents, while 40% of respondents were female. The division by gender, expressed in percentages approximate the division by gender expressed in percentages in this study [16]. Written by Dong et al., (2010) in his study examined the reliability of MoCA test in detecting cognitive impairment and have come up with results that indicate high reliability in detecting cognitive impairment [17]. The results are comparable with the results of this study, which also show high reliability MoCA test in detecting cognitive impairment. The claim about the reliability of MoCA test in detecting cognitive problems was confirmed in a study carried out by Handžavečkić and associates, (2011) identified with the results of this study which confirm the reliability of this test [18]. Written by Smith et al., (2007) in their study, they wanted to discover the mild cognitive impairment in people with stroke and the MoCA test had deployed as a measuring instrument [19]. The results of their study indicated the reliability of MoCA test in the detection of mild cognitive impairment and are comparable with the results in this study. In addition to studies that show high reliability in the detection of cognitive impairment in patients with stroke, the study conducted by Chan et al., (2014) indicates that MoCA test has a low detection rate of cognitive problems in people with stroke in relation to the detailed neuropsychological estimates [20]. However, more detailed neuropsychological assessment are often impractical in acute stroke and to implement them need a long time, and for certain neuropsychological assessment requires special training for examiners said Demeyere et al., (2016) in his study [21]. These allegations are contrary to the allegations in this study, because the MoCA test is designed for quick assessment of cognition and is not necessary for a long time even for special training of examiners.

The available literature failed to identify studies in which they applied intense somatotherapy and occupational therapy along with people after a stroke, but its effect was measured MoCA test. In view of the aforementioned fact the results of the final tests are not comparable with other results which makes this original study. But the originality of this study lies in the effectiveness of parallel implementation of these two therapies manifested impairment of cognitive deficits in the final testing is also 78.4% had a score <26 points, while during the initial tests 92.4% of respondents were with a score <26 points. A score of 26 points or more present is at 8% of the initial examination, while the final test score of 26 points present with 22% of respondents. For initial testing segments MoCA test, percentages of subjects with a minimum and maximum number of points was increased, indicating diminished cognitive potential and the presence of cognitive disorders associated with segments MoCA test. After conducted comparative intensive and individual somatoterapije and occupational therapy has been measured in the percentage distribution of respondents. The final test segments MoCA test, percentages of subjects with a minimum and maximum number of points was reduced, indicating the positive effect of the therapy, recovery of cognitive resources and reduction of cognitive disorders associated with segments MoCA test.

BENEFITS STUDY

Benefit of this study is reflected in the reduction of cognitive disorders parallel conducting intensive individual somatoterapije and occupational therapy in a short peri-

od of hospitalization of people who are suffering from a stroke. The effect of these therapies that are manifested by reducing cognitive disorders improves the quality of life of people with stroke as a benefit of the study.

THE SHORTCOMINGS OF THE STUDY

And if we look at the shortcomings of this study are related to the uneven period of time from stroke onset to the hospitalization of persons suffering from a stroke at the Department of Physical Medicine and Rehabilitation. The limited capacity of the Department disallows accommodate a larger number of patients with stroke.

CONCLUSIONS

This study confirmed the reliability of MoCA test at the initial and final testing the presence of cognitive impairment potential in people with stroke, and reliability is confirmed and when examining the effects of intensive use of individually created somatotherapy and occupational therapy to reduce the damage of cognitive potential. This study confirmed the positive effects of intensive use of individually created somatotherapy and occupational therapy to reduce cognitive impairment potential in people with stroke in a short period of hospitalization at the Department of Physical Medicine and Rehabilitation Center in Tuzla. This was the first study of its kind on the territory of the Federation of Bosnia and Herzegovina which is done at the tertiary level institution.

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