ANALYSIS OF THE RECOVERY OF PATIENTS WITH STROKE

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Abstract: The aim of current study was to assess the role of the rehabilitation for improvement of the functional capacity, the autonomy in the daily routines, ergotherapeutic activities and the quality of life of patients with stroke.

Methods: 47 patients with stroke were included in the research and their functional status was assessed according to the Brunnstrom stages of stroke recovery, the modified Rankin scale, the Barthel index, Subjective Quality of Life.

Results: In the beginning of the complex rehabilitation therapy the patients were almost entirely dependent and were notable to accomplish ergotherapeutic activities. At the end of the second rehabilitation course it was found a significant improvement of the general motor skills of the study participating patients (p<0.001). The results of the applied specialized rehabilitation program show that from 25.53 % for stages I and II and 46.81 % for stage III of Brunnstrom patients from the beginning of the first course of rehabilitation until the end of the second course of rehabilitation recover the motor functions up to 60.47 % for stage IV and 25.58 % for stages V and VI. At the end of the second course of rehabilitation program, the patients without significant neurological deficit with mRS (0-2) are 90.69 % and with significant neurological deficit mRS (3-6) are 9.31%.

Conclusion: The results confirmed the efficiency of the applied complex approach, but the recovery is not sufficient in terms of independence of the general movements and the patients’ social integration.

Keywords: rehabilitation, stroke, functional recovery.

Introduction

Stroke is the third commonest cause of death and the most frequent cause of severe adult disability. Seventy thousand individuals are living with stroke and its consequences and each year, there will be approximately 12,500 new stroke events (1).

According to the data collected by the National Center of Public Health and Analyses in 2015 Bulgaria remains the country with one of the highest rates of standardized mortality ratios (883.86 %) among the EU countries. The structure of the mortality reasons also remains unchanged as the circulatory system diseases and the neoplasm remain the leading reasons with rates of 65.4 % and 16.4 %, respectively. The incidence is between 3.7 and 4.4 per 1000 people in Bulgaria whereas in Europe it is below 3.5 per 1000 people (2).

The World Health Organization (WHO) International Classification of Impairments, Disabilities and Handicaps (ICIDH) provides the following framework for considering the impact of stroke on the individual: pathology (disease or
diagnosis): operating at the level of the organ or organ system; impairment (symptoms and signs): operating at the level of the whole body; activity limitations (disability): observed behavior or function; participation restriction (handicap): social position and roles of the individual (3-4).

The relevance and the increasing significance of developing of efficient physiotherapeutic methods and approaches for prevention and functional recovery of the patients are determined by the following reasons: increased frequency of the cerebrovascular disease occurrence, huge number of risk factors and different affected parts of the brain with lasting residual neurological symptoms (5).

The treatment and the functional recovery of post-stroke hemiparesis is a difficult and long process in which the rehabilitation activities have leading role.

In the medical literature, there have been described different scales for functional evaluation of neurological deficit as a result of the impaired cerebral blood flow. The most frequently used tests are those for spasticity, motor deficit, independence in the everyday and ergotherapeutic activities and the quality of life of the patients (6-8).

The rehabilitation of people with chronic deceases and disability is characterized as a process that aims to reach an optimal level of physical, sensory, intellectual, mental and social status for the patients (9).

Materials and methods
Object of the study.

From 68 patients with stroke with severe or moderate degree of impairment were chosen 47: 18 women (38.29% ± 11.46 %) at average age of 63 and 29 men (61.71% ± 9.03) at average age of 65. The other 21 patients had slight stroke incidence without paretic change and were not object of this study as the disability in these cases is not high. Twenty-nine patients of the studied group suffer the consequences of ischemic stroke and the rest 18 – of haemorrhagic stroke. The patients had two seven-day hospital treatment courses in the Physical Medicine and Rehabilitation Clinics at the General Hospital “St. Panteleymon”, Plovdiv for the period between 2016 and 2017. The prescription period for the studied patients is from one to ten months. Forty-three patients had two full treatment courses as between the treatment stages, 4 patients dropped out because of the neurological complications that occurred. All participants in the study or their relatives on their behalf agreed in written to participate and were informed about the rehabilitation and physical methods of treatment.

The functional status of the patients was assessed using the Brunnstrom stages of stroke recovery, the modified Rankin scale of functional capacity, the Barthel index of functional capacity. To process the information, the statistical software was used.

The studied group was treated in accordance with the basic therapeutic programme, which corresponds to the medical standards for quality health care and includes:

1. Medical therapy.

According to the neurological status of the patient (neotropin, cerebral vasodilators, anticoagulants, antidepressant, muscle relaxants) (10).

According to the American Heart Association in case of haemorrhagic stroke the ABC algorithm is recommended (Airway, Breathing, Circulation) and application of intravenous antihypertensive therapy (Labetalol, Nitroprusside, Enalapril) in patients with mean arterial pressure (MAP) >/=130 mm Hg. The modern therapy for ischemic stroke targets restoration of the blood flow (reperfusion) though thrombolysis and through different neuron protectors. The thrombolytic agents (rt-PA) have a confirmed effect of revascularization of the obturated vessel when applied in the first 3 to 4, 5 hours after the beginning of the ischemia (11).

2. Medical care.

The quality of life of the patients with stroke is highly dependent on the cares, good
faith and on the competence of the medical staff. There have been made observations on the somatic indicators of the patients, as the personal hygiene of the patients was maintained through various hygienic procedures. The impaired sense of touch and the increased skeletal muscle spasticity at initial bedsores in patients was a prerequisite for formation of decubitus. A regular turning of the patients in their beds was done every 2-3 hours as well as verticalization on chair for 10-15 min, rings were used on the sectors with higher risk of decubitus and special anti-decubitus mattresses (12).

3. Preformed physical factors.

Low frequency pulse magnetic field, electrostimulation, laser treatment and laser puncture were the main approaches applied. In cases of serious spasticity, we applied paraffin application or cryotherapy (13).

4. Kinesitherapy – individual active and passive gymnastics, learning basic daily routines, ergotherapeutic activities, training in walking, exercises for stabilization of balance and walking.

Statistical analysis of the data was performed using the SPSS 17 version. All subjects’ characteristics were quantitative variables and they were expressed as the mean ± standard deviation.

Results and discussion

Patient functional status is analyzed often by different methods: Brunnstrom stages of stroke recovery, the Barthel index(14-15), Kabat; Stroke Action Test, containing 21-item stroke symptoms and 7 item non-stroke symptoms (16). The Brunnstrom stages of stroke recovery is very often applied (17).

At the beginning of the first complex rehabilitation course, the patients had severe and moderate hemiparesis and they were highly dependent and unable to do routine activities. At the end of the second course of rehabilitation we found general improvement of the motor functions of the studied patients and statistically significant improvement - 60.47 % for stage IV and 25.58 % for stages V and VI (p<0.001). This improvement is shown in the change of the initial values of the assessment.

The data in Table 1 show the relative proportion of the patients divided by the severity of the hemiparesis at the beginning and the end of the first and the second of the physical and rehabilitation therapy.

<table>
<thead>
<tr>
<th>Brunnstrom Test</th>
<th>Stage of Brunnstrom</th>
<th>First rehabilitation course</th>
<th>Second rehabilitation course</th>
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<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>End</td>
<td>Beginning</td>
</tr>
<tr>
<td>N</td>
<td>% ± SD</td>
<td>N</td>
<td>% ± SD</td>
</tr>
<tr>
<td>I-II</td>
<td>12</td>
<td>25.53±12.58</td>
<td>6</td>
</tr>
<tr>
<td>III</td>
<td>22</td>
<td>46.81±10.64</td>
<td>14</td>
</tr>
<tr>
<td>IV</td>
<td>8</td>
<td>17.02±13.29</td>
<td>20</td>
</tr>
</tbody>
</table>
Table 2. Stage of disability during the first and the second course of rehabilitation.

<table>
<thead>
<tr>
<th>mRS points in the first course of rehabilitation</th>
<th>Beginning</th>
<th>End</th>
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</thead>
<tbody>
<tr>
<td>N(number)</td>
<td>% ± SD</td>
<td>N(number)</td>
</tr>
<tr>
<td>0-2</td>
<td>13</td>
<td>27.66±12.41</td>
</tr>
<tr>
<td>3-6</td>
<td>34</td>
<td>72.34±7.67</td>
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<table>
<thead>
<tr>
<th>mRS points in the second course of rehabilitation</th>
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<tbody>
<tr>
<td>N(number)</td>
<td>% ± SD</td>
<td>N(number)</td>
</tr>
<tr>
<td>0-2</td>
<td>27</td>
<td>62.79±9.30</td>
</tr>
<tr>
<td>3-6</td>
<td>16</td>
<td>37.21±12.08</td>
</tr>
</tbody>
</table>

The transition from one recovery stage of Brunnstrom to another was studied, as well as the recovery of the different in complexity and importance functions for the limbs and the torso, overcoming the pathological gait, balancing reactions and the fine prehensile ability. The results of the applied specialized rehabilitation programme show that from 25.53 % ± 12.58% for stages I and II and 46.81 % ± 10.64 %. For stage III of Brunnstrom (severe motor deficit) the patients from the beginning of the first course of rehabilitation until the end of the second course of rehabilitation recover the motor functions up to 60.47 % ± 9.59 %, for stage IV and 25.58 % ± 13.16 % for stages V and VI. Never the less 13.95 % ± 14.49 % of the patients remain with severe deficit in the primitive motor schemes, which troubles seriously their independence in their daily routines. From the analysis of the data for the functional assessment of the studied patients it can be seen that growth during the two courses of rehabilitation is statistically significant (p<0.001).

We assessed the functional disability of the studied patients using a seven-stage (0 to 6 points) modified Rankin scale (mRS) for evaluation and assessment of the abilities of the patients for independent self-service. The testing done according to the scale predicts motor outcome after stroke (Table 2).

The complete clinical recovery corresponds to 0 points and the fatal outcome – to 6 points.

The studied patients were divided into two subgroups according to the stage of disability:

I – mild stage from 0 to 2 points – lack of disability, minimal or light deficit;
II – expressed disability stage – from 3 to 6 points – moderate and severe stage of disability.

The functional status of the patients according to the Rankin scale mRS (0-2) is registered at 27.66% ± 12.41%, and with mRS (3-6),
they are 72.34% ± 7.67% during the first course of rehabilitation. Deepening of the neurological deficit is registered at 44.68 % ± 10.85 %. At the end of the second course of rehabilitation, programme the patients without significant neurological deficit with mRS (0-2) are 90.69% ± 4.65%, and the ones with significant neurological deficit mRS (3-6) are 9.31%. Patients with mild disability and lack of functional deficit are dominating.

Barthel index is a specialized test which is used for studying of the everyday activities (13). Recently it has been adopted by the Bulgarian neurological and kinesitherapeutical practices. It includes 10 activities that include the number 0, 5, and 15. The overall result varies from 0 to 100 points as the highest score of 100 points show full functional independence of the patient (15).

In the studied patients, the functional capacity according to the Barthel index has average score of 55 points at the beginning of the complex rehabilitation and it reaches average score of 85 points at the end of the course. The progress of the patients’ recovery according to the Barthel index is visible at the end of the second course of rehabilitation, between the 6th month and the 1st year after the incident. There has been a delay in the recovery of the patients with the fine motion of the activities for self-service of the paretic hand.

Conclusions

The methods of functional assessment of the routine abilities of the patients allowed us to trace the growing potential of the independent movements, locomotion and self-service. As for the assessment of the ergotherapeutical activities and the grip of the paretic hand there is detention in the recovery process, which affects negatively the quality of life of the patients with stroke.

Stroke rehabilitation in hospital or within the community is a patient-centred process with a variety of professional staff contributing to the overall management of an individual patient. An important principle of rehabilitation is goal setting. Stroke unit care usually incorporates a process in which individual recovery goals are identified and monitored (18).

Better functional recovery is noticed in patients at younger age and with mild neurological symptoms at baseline.

There is not a unified rehabilitation approach for fast and easy recovery of the motor skills of the patient. This is a reason for subsequent search of effective and adequate way for treatment of motor deficit, as the limitations it sets leads to severe disability.

References


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