Cognitive, Emotional, and Physical Functioning in Post-Stroke Patients within In-Hospital Rehabilitation

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Abstract

Background: Stroke is a well-known leading cause of death and disability in the world. Cognitive and affective disorders are considered as frequent consequences within the first months after acute ischemic stroke. Cognitive decline is associated with poor outcomes, prolonged in-hospital stay and higher mortality rate in stroke survivors. Cognitive impairments can lead to behavioural changes that negatively impact patient's adherence to physical rehabilitation. Anxiety and depression are also common complications among subjects with stroke. Affective disorders are associated with higher mortality rate, poor functional activity, and decreased quality of life in stroke survivors. However, recent research is focusing on post-stroke depression, not on anxiety. Impact of cognitive and affective disorders on outcome of stroke physical rehabilitation is still not established. Therefore, we aimed to assess cognitive and physical functioning, anxiety, and depression in post-stroke patients within in-hospital rehabilitation.

Methods: 84 hypertensive in-patients with acute ischemic stroke of moderate severity according to NIH Stroke Scale (NIHSS) were examined. The study group included 56 females and 44 males, aged 67±1year. After stabilization, within the first week after admission (the baseline), and according to their condition and functional ability all patients were involved into individualized everyday stroke physical therapy program. The assessment was performed at baseline and pre-discharge. The severity of stroke; neurologic disability level and patient's dependence in the daily activities; functional mobility; independent functioning and every-day activity were assessed with NIHSS; Rankin scale; Rivermid and Barthel Indexes, respectively. Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA) were used for cognitive screening. Levels of affective disorders were evaluated with Hamilton Depression (HDRS) and Anxiety (HARS) Rating Scales. The subjective quality of life was screened with 10-points visual-analogue scale (VAS, with 10 as the highest score).

Statistical analysis was performed using Statistica 10.0 (StatSoft Inc., USA) version. Analyses of variance (ANOVAs and ANOVA REPEATED), Mann-Whitney U-test for comparisons between two independent samples, Wilcoxon matched pair test were used. Statistical significance was set at p<0.05.

Results and Discussion: The initial NIHSS score was <8 and 60% patients demonstrated total dependency, significant decrease in mobility and every-day activity levels. The baseline minimal cognitive deficits were registered in 72% (MoCA) and 58% (MMSE) cases, that confirms higher reliability of MoCA in the acute stroke setting. The main compromised cognitive components were impaired attention and memory. As expected, cognitive disorders were prevalent in elderly patients. Cognitive disfunction predominated in females and was associated with functional disabilities and significant dependency increase (Barthel Index r= 0.28, p=0.03). At baseline patients demonstrated minimal and moderate depression and anxiety in 39% and 44% cases, respectively. These data conflicts with the literature data, possibly due to significant variety of affective disorders testing time frame in post-stroke patients assessment/research. 78% post-stroke subjects presented comorbidity of anxiety and depression. Anxiety was prevalent in elderly and female patients. Levels of both depression and anxiety were associated with decrease of functional mobility and independency levels. According to MoCA affective disorders in post-stroke patients were also associated with the severity of cognitive impairment. The patients ranged their initial quality of life as rather low (VAS score 4.8±0.3).

Within in-hospital stay all patients managed to complete 15 to 60 minutes safe 15±1 training sessions according to their baseline condition. No adverse events were registered.

Final evaluation at discharge demonstrated significant decrease of neurological deficit and improvement in NIHSS score. However, patients with affective or cognitive disorders showed less positive change and were about NIHSS 1 score higher compared to post-stroke subjects without cognitive disfunction, depression and anxiety. These findings decrease the likelihood of positive discharge outcome in the cohort.

In all cases the individual training goals in recovery of functional abilities were achieved and the patients improved the level of their independence. It means that after completion of in-hospital physical rehabilitation programme post-stroke patients could use the affected limb and regained the ability of independent walking (with assistive devices if necessary), feeding, dressing, grooming; sitting and toilet transferring; bowel and bladder self-care. However, the in-hospital treatment and rehabilitation did not improve subjective quality of life, that was associated at discharge with depression, anxiety, patient's disability and dependence in the daily activity.

Compared to baseline in-hospital post-stroke patients finally demonstrated cognitive improvement. According to MoCA prevalence of cognitive disorders decreased up to 67% cases, while MMSE revealed normal cognition in the study group at discharge. These data confirm less sensitiveness of MMSE test in in-hospital stroke patients. Cognitive disorders correlated in patients with decreased mobility and reduced functioning ability (Rankin scale r=-0.4, p=0.01; Rivermid Index r=0.52, p=0.01; Barthel Index r=0.41, p=0.01). These data suggest expediency of long-term specific neuropsychological rehabilitation to meet the burden of post-stroke cognitive disorders.

Despite the absence of specific intervention positive changes in emotional sphere were registered at discharge: affective disorders decreased as functional abilities, independence and mobility improved. Final re-evaluation at discharge showed that subjects with depression and anxiety experienced decreased mobility and independent functioning (ex.: could not independently climb up the stairs; demonstrated more dependence in the daily activity, etc.). In-hospital stay of post-stroke patients with affective disorders was prolonged by 23% (5 days). These findings suggest depression and anxiety as determining factors of ischaemic stroke in-patients' outcomes. In comparison with the post-stroke patients without affective disorders, depression and anxiety were associated with cognitive decline at discharge.

The provided report showed that further longitudinal randomized research with a larger number of subjects is required. A comparative assessment of premorbid functioning is needed to understand the impact of stroke on cognitive status and emotional sphere.

Conclusions: Our results support the idea that neurologic condition and physical functioning are associated with cognitive and affective disorders in post-stroke in-hospital patients. Anxiety is registered in about 40% of post-stroke patients and is comorbid to depression. Cognitive decline, depression and anxiety negatively impact in-hospital functional recovery. Affective disorders significantly prolong in-hospital stay of post-ischemic stroke patients. These findings show that stroke patients with cognitive and affective disorders could need additional specialized care to improve rehabilitation outcomes.

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