

PROBLEMS OF MEDICAL REHABILITATION IN PATIENTS AFTER A TRANSIENT ISCHEMIC ATTACK

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The efficacy of rehabilitation in post-TIA patients still remains a clinical challenge, considering the combined burden of the primary disease and comorbidities. The aim of this study was to provide a rationale for introducing psychological counseling into post-TIA rehabilitation programs after studying the presentations of cognitive and emotional impairments developed after this cerebrovascular event. We analyzed in- and outpatient medical records of 351 participants (the mean age was 58.6 ± 2.2 years) who had experienced a TIA. Data was collected from forms 0.25/y and 003/y, medical/social questionnaires and also included MMSE and HADS scores. We found that CI and MD ranked second after cardiovascular diseases among the comorbidities in post-TIA patients (186.8 cases per 100 patients). We conclude that rehabilitation of post-TIA patients should involve a multidisciplinary team of experts including a psychotherapist or a clinical psychologist who will provide psychological counselling.

Keywords: transient ischemic attack, neuropsychological disorders, cognitive impairment, mood disorders, medical rehabilitation

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АКТУАЛЬНЫЕ ВОПРОСЫ ОРГАНИЗАЦИИ МЕДИЦИНСКОЙ РЕАБИЛИТАЦИИ ПАЦИЕНТОВ, ПЕРЕНЕСШИХ ТРАНЗИТОРНУЮ ИШЕМИЧЕСКУЮ АТАКУ

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Повышение эффективности реабилитационных мероприятий у пациентов, перенесших транзиторную ишемическую атаку (ТИА), с учетом особенностей основного и ведущих сопутствующих заболеваний остается актуальной задачей. Целью исследования было на основании изучения особенностей когнитивных и эмоциональных нарушений обосновать значение психокоррекции в комплексе реабилитационных мероприятий у пациентов, перенесших ТИА. Была изучена и проанализирована заболеваемость у 351 пациента, перенесшего ТИА. Средний возраст обследованных пациентов составил $58,6 \pm 2,2$ года. Для сбора информации проводили выкопировку данных из медицинских карт амбулаторных больных (форма 0,25/у) и медицинских карт стационарных больных (форма 003/у), в том числе данных опроса пациентов по Анкете медико-социальной характеристики пациентов, учитывали также данные шкал MMSE, HADS. Выявлено, что второе место по уровню заболеваемости у пациентов, перенесших ТИА, после заболеваний сердечно-сосудистой системы занимают психические расстройства, распространенность которых составила 186,8 случая на 100 пациентов. Важное место в программах медико-социальной реабилитации пациентов, перенесших ТИА, должна занимать коррекция психических расстройств с участием психотерапевта, медицинского психолога в составе мультидисциплинарной бригады.

Ключевые слова: транзиторная ишемическая атака, нейропсихологические расстройства, когнитивные нарушения, эмоциональные расстройства, медицинская реабилитация

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A transient ischemic attack (TIA) is a type of an acute cerebrovascular syndrome that is not accompanied by persistent neurological symptoms characteristic of a focal brain injury. Because TIA symptoms rapidly resolve on their own, patients often ignore them as insignificant and do not seek immediate medical help; for the same reason, doctors may not recognize the short-lived symptoms as TIA [1].

TIA can be a harbinger of a much more devastating acute vascular event; therefore, its clinical importance and prognostic value should not be underestimated. Post-TIA patients are at a higher risk of myocardial infarction (MI), stroke or death within 5 years after TIA [1–4]. But apart from being a marker of an upcoming cardio or cerebrovascular episode, TIA is also linked

to the development of such nonfatal conditions as cognitive impairment (CI) and mood disorders by a few Russian and international researchers [5, 6].

Studies of cognitive function in hypertensive post-TIA patients reveal that such patients suffer from CI; they also demonstrate an association between CI and changes to brain morphology induced by elevated blood pressure. Interestingly, CI does not have any clinically or functionally significant impact on the patients before TIA occurs [5]. Among post-TIA patients, CI is more common in men than women [6]. Research into structural and morphological changes to brain matter in patients with TIA and CI has found signs of cerebral atrophy localized to the thalamus, hypothalamus and the dentate gyrus

[5–7]. The researchers suggest that cognitive and emotional impairments in this cohort are a result of brain matter atrophy.

CI is diagnosed in over 40% of post-TIA patients [4]. Researchers are particularly interested in studying the severity and clinical presentations of cognitive and mood disorders, their prognostic value and effect on a patient's daily life.

Microstructural tissue damage induced by TIA causes cortical and subcortical structures to disconnect. Although motor function is spared, the disconnection promotes development of neuropsychological disorders that have no lesser impact on the patient than post-stroke motor disorders. Exploration of and interaction with the outside world rely on intact cognitive function; in post-TIA patients, its deficit is exacerbated by emotional lability [7].

In order to improve the outcome of rehabilitation programs and to reduce the risk of recurrence in post-TIA patients, the following parameters should be factored into: the patterns of neurological and mental disorders that accompany TIA, possible comorbidities, patients' social and hygienic characteristics. This will help physicians to tailor rehabilitation to the individual patient.

The aim of this study was to provide a rationale for introducing psychological counseling into rehabilitation programs for post-TIA patients after studying the presentations of cognitive and emotional impairments in such patients.

METHODS

The study of cognitive and emotional impairments in 351 patients was based on the analysis of out- and inpatient medical records (Forms 0.25/y and 003/y) and medical/social questionnaires. For female participants, the mean age was 59.6 ± 2.3 years; for male participants, 57.6 ± 2.2 years. The mean age of the entire cohort was 58.6 ± 2.2 years.

CI and its severity were inferred from the patients' medical records that included Mini Mental State Examination (MMSE) scores [8]. The severity of mood disorders was evaluated based on the Hospital Anxiety and Depression scale (HADS) [9], which is used in the setting of a GP practice.

Of all female patients, 46.7% were retired but working. Most patients had a college (47.0%; $n = 165$) or university (35.3%; $n = 124$) degree. The majority of the patients were not satisfied with their current job (62.1%; $n = 218$). One in 5 patients was either widowed or unmarried (19.9%; $n = 70$); this subgroup was dominated by women. We discovered that 79.7% ($n = 280$) of the patients lived with their families; 5.6% ($n = 20$) had relatives but lived separately; 14.7% ($n = 51$) did not have a family. Permanent disabilities were observed in 73 patients (20.8%); of them 58 (79.4%) had a 3rd degree disability, and only 15 (20.6%) had a 2nd degree disability.

Information selected from the medical records was entered into special case sheets and processed in *Excel* (Microsoft;

USA) and *Statistica* 8.0 (StatSoft Inc; USA). The results were presented as the mean + the mean error ($M \pm m$) and the median (Me) for normally distributed variables (the Kolmogorov-Smirnov test). Qualitative characteristics were presented as absolute and relative frequencies (%). The significance of differences was assessed using Student's *t*-test and the nonparametric χ^2 -test. Spearman's rank correlation coefficient was used to measure a correlation between two variables. Differences were considered significant at $p < 0.05$.

RESULTS

Detected comorbidities were categorized according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10). In terms of prevalence, circulatory system diseases ranked first (32.6%), mental disorders ranked second (31.5%) and endocrine disorders ranked third (15.5%). These 3 groups amounted to 79.6% of all pathologies detected in our post-TIA patients. Table 1 summarizes distribution of various circulatory system diseases among the study participants.

We have found that 312 (89%) patients suffered from comorbid conditions of the circulatory system varying in their severity. Two or more comorbid circulatory system diseases were observed in 130 (37.0%) post-TIA patients.

In terms of prevalence, mental disorders ranked second after circulatory system diseases in post-TIA patients (186.8 cases per 100 patients; Table 2).

Fig. 1 shows how mental disorders were distributed in the studied cohort of patients.

Organic anxiety disorder was diagnosed in 72.9% of 351 patients. CI occurred in 31.1% of the patients and was represented by moderate CI (19.9%), mild dementia (7.7%), and moderate dementia (3.4%). Depression was observed in 17.7% of the participants; of them 12.5% had subclinical depression, 3.4% had a mild depressive episode, and 1.7% suffered from moderate depression.

About 1 in every 2 patients (45.7%) was afflicted with a combination of CI and depression or cooccurring depression and anxiety. CI was most common in patients aged over 60 years, with no significant differences in prevalence between males and females. Mood disorders were more frequent in women aged 50–59, whereas depression was more common in men over 70.

Mood disorders were characterized by low mood, sadness, tension, worrying thoughts, and anxiety. The following symptoms were noticed in the majority of patients: low intellectual productivity, lack of goals, decreased motivation to come back to work and resume social contacts, difficulty concentrating, inertia, and reluctance to take part in rehabilitation programs.

The analysis revealed a strong positive correlation between CI and recurrence of an acute cerebrovascular event (TIA,

Table 1. The frequency of circulatory system diseases diagnosed in post-TIA patients

Condition	Number of cases	
	Abs.	%
Cerebrovascular diseases	312	89.0
Hypertensive heart disease	241	68.7
Atherosclerosis	185	73.7
Ischemic heart disease	141	56.2
Atherosclerotic heart disease	82	58.2
Old myocardial infarction	37	26.2
Other forms of chronic ischaemic heart disease	22	15.6
Occlusion and stenosis of cerebral arteries, not resulting in cerebral infarction	20	14.2

ischemic or hemorrhagic stroke) ($r = 0.724$; $p < 0.05$), as well as between depression and recurrence of an acute cerebrovascular event (TIA, ischemic or hemorrhagic stroke) ($r = 0.736$; $p < 0.05$).

Neuropsychological disorders and cardiovascular conditions cooccurred in 213 (60.7%) patients. Hypertension was observed in 161 (75.6%) patients (Tables 3–5). A direct, strong and reliable correlation was established between the severity of CI and hypertension ($r = 0.95$; $p < 0.05$), as well as between the severity of mood disorders and hypertension ($r = 0.95$; $p < 0.05$).

Neuropsychological disorders cooccurred with coronary artery disease (CAD) in 101 (47.4%) patients; MI was observed in 21 cases (20.8% patients with CAD; Table 6). We analyzed a correlation between cognitive/mood disorders and CAD in the presence or absence of MI. The analysis revealed a strong positive correlation between the presence of CAD and CI ($r = 0.87$; $p < 0.05$); in the patients with MI, the correlation was similar ($r = 0.97$; $p < 0.05$). The analysis also yielded a positive and reliable correlation between CAD and MD ($r = 0.93$; $p < 0.05$). The correlation between depression and CAD with MI was stronger than between depression and CAD without MI.

DISCUSSION

A few authors report the presence of vascular CI varying in severity in 70–80% of patients with acute and chronic cerebrovascular conditions [10, 11]. Minor strokes are often

the cause of CI; therefore, every patient who has experienced a TIA or a stroke should have their cognitive function evaluated [12]. Neuropsychological disorders that often have subclinical manifestations can cause emotional distress, behavioral or adjustment disorders in patients with cerebrovascular conditions [12]. CI signals the unfavorable course of a primary cerebrovascular disorder and is an indicator of low cerebral reserve, which increases the risk of a recurrent vascular event in patients with CI [11].

The data on CI and MD presented in both Russian and international literature covers mainly post-stroke patients; that said, the studied cohorts might have also included patients with TIA. So far, there have been no large-scale studies of neuropsychological conditions in post-TIA patients. The data described in the literature was collected from small cohorts of patients (less than 100) [13, 14].

In post-TIA patients, MD can affect the course of the illness, trigger another stroke or impede rehabilitation [15]. In the cited work, emotional disturbances were assessed using the HADS scale. It was hypothesized that the central focus of post-TIA rehabilitation should be on psychological counseling. Some authors believe that post-TIA patients develop anxiety and depression due to vascular damage and a profound psychological response to the event; therefore, a well-structured multidisciplinary multifactorial program that includes control over vascular risk factors as part of risk mitigation will help to bring down HADS scores and reduce the prevalence of depression a year after the vascular event [16]. Another

Table 2. Prevalence of mental disorders in post-TIA patients

Condition	Abs.	%
Cognitive impairment:	109	31.1
MCD	70	19.9
Mixed cortical and subcortical vascular dementia, mild form	27	7.7
Mixed cortical and subcortical vascular dementia, moderate form	12	3.4
Organic anxiety disorder	256	72.9
Organic mood disorder:	62	17.7
Subclinical depression	44	12.5
Mild depression	12	3.4
Moderate depression	6	1.7
Organic emotionally labile disorder	58	16.5
Total:	656	186.8

Note: MCD — mild cognitive disorder

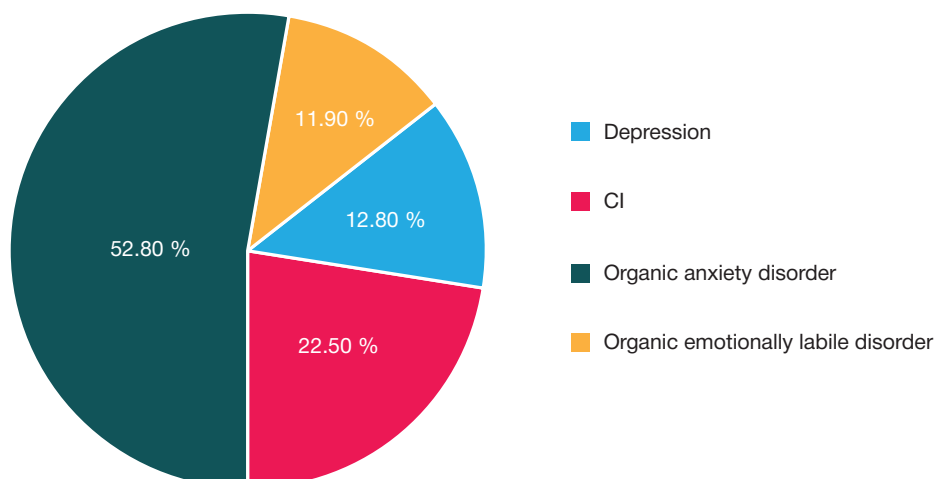


Fig. 1. Distribution of mental disorders in post-TIA patients

Table 3. Prevalence of neuropsychological (cognitive and mood) disorders in post-TIA patients with hypertensive heart disease

Cognitive impairment	Number of cases (abs.)	Number of cases with comorbid hypertensive heart disease
MCD	70	58
Mild dementia	27	22
Moderate dementia	12	12
MD:		
Subclinical depression	44	38
Mild depression	12	8
Moderate depression	6	5

Note: MD — mood disorders

Table 4. Severity of hypertensive heart disease in post-TIA patients with CI

CI \ HHD	Stage 1		Stage 2		Stage 3		Total
	Abs.	%	Abs.	%	Abs.	%	Abs.
MCD	38	54.3	12	17.1	8	11.4	58
Mild dementia	5	18.5	10	37	7	26	22
Moderate dementia	1	8.3	2	16.7	9	75	12
Total:	44		24		24		92

Table 5. Severity of hypertensive heart disease in post-TIA patients with mood disorders

CI \ HHD	Stage 1		Stage 2		Stage 3		Total
	Abs.	%	Abs.	%	Abs.	%	Abs.
Subclinical MD	30	68.4	5	11.4	3	6.8	38
Mild depression	3	25	4	33.3	1	8.3	8
Moderate depression	0	0	1	16.7	4	66.7	5
Total:	33		9		8		51

Table 6. Prevalence of CI, MD and CAD in post-TIA patients

Cognitive impairment	Number of cases (abs.)	Number of cases of comorbid CI and CAD (abs. / %)		Number of cases of comorbid CI and CAD with MI (abs. / %)	
MCD	70	18	25.7	5	7.1
Mild dementia	27	8	29.6	3	11.1
Moderate dementia	12	4	33.3	2	16.7
MD:					
Subclinical depression	44	32	72.7	8	18.2
Mild depression	12	6	50	5	41.7
Moderate depression	6	4	66.7	2	33.3

study investigated patients' psychosocial response to TIA. The authors were able to identify 6 major reaction patterns, including worrying thoughts about the future/changes in lifestyle, lack of trust, frustration, anxiety, sense of loss, sadness, confusion. Knowledge of such personal reactions to TIA can help to tailor rehabilitation to the needs of an individual patients and transform their usual coping strategies in order to achieve better rehabilitation outcomes [17].

Some authors indicate that CI can occur in patients who have already experienced a TIA or a minor stroke [5, 18, 19]. Within 9 months following TIA, one-third of patients develop CI interfering with their lifestyle [20].

To sum up, MD and CI in post-TIA patients can be used to tailor rehabilitation programs to the needs of an individual patient.

CONCLUSION

CI and MD rank second after cardiovascular diseases among the comorbidities in post-TIA patients (186.8 cases per 100 patients). Mental disorders cooccur with circulatory system diseases in 60.7% of post-TIA patients. We have established direct, strong and reliable correlations between the severity of CI and the presence of hypertensive heart disease ($r = 0.95$; $p < 0.05$), between the severity of mood disorders and hypertensive heart disease ($r = 0.95$; $p < 0.05$) and its stage. A combination of neuropsychological disorders and CAD was observed in 47.4% of post-TIA patients. Therefore, rehabilitation for such patients should be well-structured, multidisciplinary and account for multiple factors, including possible comorbidities among which neuropsychological disorders play a significant role.

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