

## QUALITY OF LIFE IN STROKE PATIENTS IN RESIDUAL STROKE PERIOD AND ITS DETERMINANTS

Molchanova EE<sup>1</sup> ✉, Polunina VV<sup>2</sup>, Polyayev BA<sup>2</sup>, Plotnikov VP<sup>2</sup>, Lobov AN<sup>2</sup>, Parastayev SA<sup>2</sup>

<sup>1</sup> Amur State Medical Academy, Blagoveshchensk, Russia

<sup>2</sup> Pirogov Russian National Research Medical University, Moscow, Russia

Stroke remains one of the leading causes of disability; therefore, it is important to investigate factors that might affect the quality of life of stroke patients and refine rehabilitation technologies for better functional gains. The aim of this paper was to study possible factors that determine the quality of life in the residual ischemic stroke period. The MOS SF-36 health survey was completed by 210 patients undergoing early rehabilitation at a stroke care unit. The study revealed a significant decline in some quality of life indicators correlated with advancing age and severity of the condition (correlation coefficient  $-0.5$ ;  $p < 0.01$ ). Both physical and mental component summary scores were lower in women than in men ( $p < 0.01$  and  $p < 0.001$ , respectively). High scores on the majority of the applied subscales were observed in the patients with a vertebrobasilar stroke, as compared with those who had suffered a carotid stroke ( $p < 0.05$ ). The early rehabilitation regimen complemented with acupuncture in the acute stroke period and the subsequent rehabilitation program at the Rehabilitation Hospital significantly contributed ( $p < 0.05$ ) to improving the quality of life of stroke patients in the residual stroke period.

**Keywords:** quality of life, ischemic stroke, rehabilitation, acupuncture

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**Compliance with ethical standards:** the study was approved by the Ethics Committee of Amur State Medical Academy (Protocol № 10 dated November 20, 2019); the study conformed with the guidelines for the medical research involving human subjects. Voluntary informed consent was obtained from all the participants.

✉ **Correspondence should be addressed:** Elena E. Molchanova  
Gorkogo, 95, Blagoveshchensk, 675000; helendok@mail.ru

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## КАЧЕСТВО ЖИЗНИ ПАЦИЕНТОВ В РЕЗИДУАЛЬНОМ ПЕРИОДЕ ИШЕМИЧЕСКОГО ИНСУЛЬТА И ОПРЕДЕЛЯЮЩИЕ ЕГО ФАКТОРЫ

Е. Е. Молчанова<sup>1</sup> ✉, В. В. Полунина<sup>2</sup>, Б. А. Поляев<sup>2</sup>, В. П. Плотников<sup>2</sup>, А. Н. Лобов<sup>2</sup>, С. А. Парастаев<sup>2</sup>

<sup>1</sup> Амурская государственная медицинская академия, Благовещенск, Россия

<sup>2</sup> Российский национальный исследовательский медицинский университет имени Н. И. Пирогова, Москва, Россия

Инсульт остается одной из основных причин серьезной инвалидизации, поэтому изучение факторов, влияющих на качество жизни постинсультных больных, и совершенствование реабилитационных технологий, способных улучшить его, сохраняет актуальность. Целью исследования было изучить возможные факторы, определяющие качество жизни больных, перенесших ишемический инсульт, в резидуальном периоде. Анкетирование проводили с помощью опросника MOS SF-36 у 210 пациентов, проходивших курс ранней реабилитации в условиях первичного сосудистого отделения. Исследование показало достоверное ухудшение ряда показателей качества жизни с увеличением возраста пациентов и тяжести инсульта (с коэффициентом корреляции  $-0.5$ ;  $p < 0.01$ ). У женщин оказались более низкими как физический ( $p < 0.01$ ), так и психический ( $p < 0.001$ ) компоненты качества жизни. Более высокие значения большинства субшкал качества жизни ( $p < 0.05$ ) получены в группе пациентов, перенесших вертебробазилярный инсульт, по сравнению с пациентами, у которых была каротидная локализация очага. Оптимизация ранней реабилитации включением методов рефлексотерапии в остром периоде инсульта и продолжение реабилитационного процесса в условиях «Больницы восстановительного лечения» способствовали повышению ( $p < 0.05$ ) качества жизни пациентов в периоде отдаленных последствий.

**Ключевые слова:** качество жизни, ишемический инсульт, реабилитация, рефлексотерапия, акупунктура

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✉ **Для корреспонденции:** Елена Евгеньевна Молчанова  
ул. Горького, д. 95, г. Благовещенск, 675000; helendok@mail.ru

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Long-lasting disability after stroke is increasingly common [1]. The growing incidence of cardiovascular disease and cerebrovascular accidents is one of the grave consequences of population ageing [2]. Advances in acute stroke therapy have improved survival of stroke patients with pronounced neurological deficits. Poststroke disability poses a serious scientific and clinical challenge and is a significant social and economic burden [3]. The expanding arsenal of pharmacological interventions and rehabilitation technologies has reduced

mortality among stroke patients but created a large population of people struggling with the aftermath of stroke. Currently, there are over 2 million stroke survivors in Russia [4]. The overwhelming majority of these people have to adapt to the acquired functional limitations and accept the profound impact of their disability on the family, professional and social life [5]. Therefore, the quality of life (QOL) after stroke and the effectiveness of poststroke rehabilitation cannot be measured by the survival rate alone [4]. This raises the need for research

into factors that affect QOL in stroke patients as QOL is one of the most reliable criteria used to analyze the effectiveness of new diagnostic and therapeutic techniques and prevention strategies [6–8].

So far, a few factors that might affect QOL in stroke patients have been studied, including sex [9, 10], age [11], severity of stroke [12], family status, occupational status, and duration of rehabilitation [13]. Earlier studies also looked into the effect of ischemic lesion location on the patient's QOL, but it is difficult to draw any definitive conclusions from those publications due to their scarcity. Some authors point to more pronounced cognitive and emotional impairments in patients with right hemisphere ischemic or hemorrhagic strokes, suggesting that right hemispheric lesions might be predictors of unfavorable outcome [14–16]. At the same time, according to another study the prevalence of anxiety and depression is by 20–30% higher in patients with left hemisphere ischemic stroke (IS) [12]. Patients with a left hemisphere stroke have higher physical component summary scores ( $p < 0.05$ ) and higher general health (GH) scores on the SF-36 scale in the acute and early rehabilitation period [10]. Patients with a vertebralbasilar (VB) stroke demonstrate better (20–50%;  $p < 0.05$ ) physical function than patients with hemispheric IS, regardless of the involved side [12]. It is reported that physical decline after stroke is more dramatic than mental decline, regardless of the lesion site [17].

Rehabilitation programs complemented by non-pharmacological interventions in the early rehabilitation period improve QOL twofold, allowing 72.7% of patients to return to work within 6 months after stroke [18, 19]. There are publications discussing the advantages of poststroke rehabilitation in a specialized healthcare facility (sanitarium) vs. an outpatient clinic [20, 21].

Thus, studies investigating the factors that affect QOL in poststroke patients produce conflicting data. In addition, there is a paucity of information on the long-term impact of stroke on QOL. Insufficient data about a patient and their condition is a setback for the refinement of rehabilitation programs and prevention strategies. Identifying the predictors of gains will allow to improve the quality of rehabilitation [14, 16]. Therefore, it is important to investigate factors that affect QOL of stroke patients and refine rehabilitation programs for better functional gains.

The aim of this study was to investigate factors that determine QOL in the residual stroke period (3 years after the acute cerebrovascular accident).

## METHODS

Our study was conducted between 2013 and 2017 and recruited 210 patients (110 females and 100 males) aged 40–78 years (the mean age was  $64.4 \pm 1.05$  years) undergoing neurorehabilitation at the stroke care unit of Blagoveshchensk City Clinical Hospital. Ischemic stroke was confirmed by CT and/or MRI findings. The majority of the participants (140; 66.7%) had a middle cerebral artery stroke (right-sided lesion was diagnosed in 79 (37.6%) patients; left-sided lesion was detected in 63 (30%) patients). A VB stroke was diagnosed in 68 (32.4%) patients. According to the classification of acute ischemic stroke subtypes (TOAST, 1993), 120 patients (57.1%) had large-artery atherosclerosis, 53 patients (25.2%) had cardioembolism, 12 (5.7%) had small-vessel occlusion, and 25 (11.9%) had a stroke of undetermined etiology.

In the acute stroke period, all patients were receiving a standard pharmacological therapy and non-pharmacological rehabilitation. For 140 patients, the rehabilitation program was complemented with acupuncture (AP); another 70 patients

had physiotherapy and exercise without AP. Assignment to the AP or no AP groups was done through randomization. After being discharged from the hospital, 63 patients continued their rehabilitation at the Rehabilitation Hospital (RH); the remainder participants continued rehabilitation at an outpatient clinic.

The following inclusion criteria were applied: voluntary informed consent; IS confirmed by CT/MRI; age of 35–80 years; no contraindications for physiotherapy, AP and therapeutic exercise. Exclusions criteria: severe cognitive or mental impairment, pronounced aphasia or motor impairment that could prevent patients from completing the survey.

QOL was evaluated using an 8-scale MOS SF-36 health survey, which the participants completed independently [22] in the acute stroke period before being discharged home and 3 years after the cerebrovascular accident. The results were assessed on the scale from 0 to 100 points. A higher score meant a better QOL. SF-36 has two summary scales consisting of 4 subscales each: the physical component summary and the mental component summary. QOL was compared between the groups comparable in terms of sex, age, lesion site and rehabilitation modalities applied during the acute stroke period. To study the effects of different rehabilitation programs (with or without AP) on QOL in the residual stroke period, gains were compared between the groups of patients comparable in terms of sex, age, lesion site, and stroke pathogenesis. We also compared the outcomes between the patients who continued their rehabilitation at the outpatient clinic and at the specialized RH. These 2 groups were based on the case-control principle and were identical in terms of age, sex, severity of the condition on admission, lesion site, stroke pathogenesis, and the applied rehabilitation modalities in the acute stroke period.

Additionally, the psychological and emotional state of the patients was evaluated using Beck's Depression Inventory and the Spielberg–Khanin anxiety scale.

Normally distributed variables are presented below as a mean  $\pm$  the standard error of the mean ( $M \pm m$ ) or as a mean  $\pm$  a standard deviation ( $M \pm SD$ ). Significance of differences was assessed using Student's *t* test. Pearson's correlation coefficient *r* was used to determine the strength and direction of correlations between the studied variables. Differences were considered significant at  $p < 0.05$ .

## RESULTS

The SF-36 survey revealed a decline in the mental ( $56.5 \pm 2.8$  points) and psychoemotional ( $59.8 \pm 2.7$  points) states of the participants in the acute IS period before discharge from the hospital. By contrast, the physical and mental components assessed in the residual stroke period (3 years after stroke) were characterized by significantly higher scores ( $81.1 \pm 2.1$  points and  $77.8 \pm 1.9$  points on average, respectively;  $p < 0.001$ ). The only exception in the residual stroke period was the low vitality score (VT;  $p < 0.001$ ) (Fig. 1).

A negative correlation was discovered between the age of the patients and their RP (physical role functioning) and vitality (VT) scores ( $-0.44$ ,  $p < 0.05$  and  $-0.5$ ,  $p < 0.01$ , respectively) in the acute stroke period. The strength of this correlation increased for the residual stroke period. Advancing age was significantly correlated with PF (physical functioning;  $-0.5$ ,  $p < 0.01$ ), GH (general health;  $-0.5$ ,  $p < 0.01$ ) and VT (vitality;  $-0.6$ ,  $p < 0.001$ ). Age between 44 and 60 years was the most favorable age in terms of a better QOL prognosis; the lowest scores were observed in the age group above 75 years (Fig. 2). Our study did not establish any correlations between age and the development of depression and anxiety.

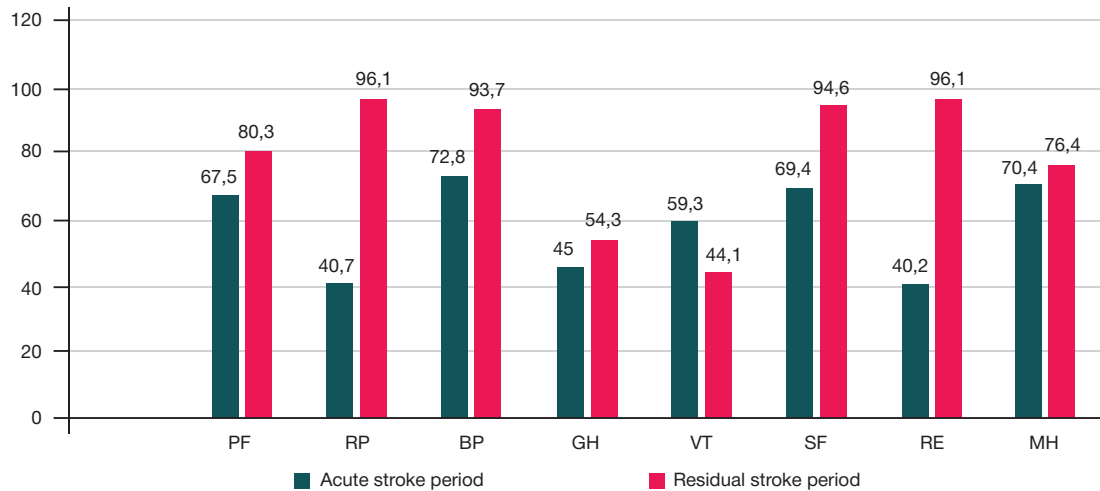


Fig. 1. Dynamics of QOL indicators in the acute stroke period (at the end of the early rehabilitation program) and 3 years after stroke

Women scored lower on the majority of SF-36 subscales. The differences between female and male scores were significant for RP (physical role functioning;  $p < 0.05$ ) and RE (emotional role functioning;  $p < 0.001$ ) scales in the acute stroke period and for PF (physical function;  $p < 0.01$ ), RP (physical role functioning;  $p < 0.05$ ), BP (bodily pain;  $p < 0.05$ ), GH (general health,  $p < 0.001$ ), VT (vitality;  $p < 0.001$ ), and MH (mental health;  $p < 0.01$ ) in the residual stroke period (Fig. 3). The analysis of the psychoemotional state revealed a more severe depression in women ( $13.4 \pm 1.1$  points) than in men ( $9.6 \pm 1.1$  points;  $p < 0.05$ ).

Our study established negative correlations between QOL indicators in the residual stroke period and the severity of stroke on the NIHSS scale assessed on admission to hospital, PF (physical functioning;  $-0.6, p < 0.001$ ), GH (general health;  $-0.4, p < 0.05$ ), VT (vitality;  $-0.5, p < 0.01$ ), SF (social functioning;  $-0.5, p < 0.01$ ), and MH (mental health;  $-0.5, p < 0.01$ ).

Patients with a right MCA stroke had the lowest scores for PF (physical functioning;  $p < 0.05$ ) in the acute stroke period. In the residual stroke period, significant differences were detected in PF (physical functioning;  $p < 0.05$ ), RP (physical role functioning;  $p < 0.05$ ) and RE (emotional role functioning;  $p < 0.05$ ) scores between patients with a right MCA stroke and those with a VB stroke, who scored highest on most subscales. GH (general health) and VT (vitality) scores were the lowest in patients with a left MCA stroke, differing significantly ( $p < 0.05$ )

from GH and VT scores of patients with a VB stroke (Fig. 4). Patients with a hemispheric infarction due to internal carotid artery occlusion suffered from a more severe depression ( $14.2 \pm 1.5$  and  $13.7 \pm 1.3$  points for left and right hemispheric lesions, respectively) than those with a VB stroke ( $8.3 \pm 1.1$  points;  $p < 0.01$ ). Carotid and vertebrobasilar strokes also differed in terms of neurological deficit severity on admission ( $6.1 \pm 0.3$  and  $4.7 \pm 0.3$  points, respectively;  $p < 0.01$ ) and at the time of discharge ( $2.3 \pm 0.2$  and  $1.5 \pm 0.2$  points, respectively;  $p < 0.01$ ).

The introduction of AP into the early rehabilitation program resulted in higher scores on most SF-36 subscales both in the acute stroke period (RP,  $p < 0.05$ ; GH,  $p < 0.05$ ; VT,  $p < 0.05$ ; SF,  $p < 0.05$ ; RE,  $p < 0.05$ ; MH,  $p < 0.05$ ) and in the residual stroke period (PF,  $p < 0.05$ ; GH,  $p < 0.05$ ; VT,  $p < 0.01$ ; MH,  $p < 0.05$ ) (Fig. 5). AP also contributed to decreasing reactive anxiety by an average of 8.5 points (22%;  $p < 0.001$ ) and depression by an average of 4.9 points (30%;  $p < 0.001$ ) by the time of discharge. No significant differences in these parameters were observed in the group of patients from the no AP group.

Three years after the cerebrovascular accident, QOL was higher in patients who continued rehabilitation at RH. The differences were statistically significant for PF (physical functioning;  $p < 0.05$ ), BP (bodily pain;  $p < 0.05$ ), GH (general health;  $p < 0.05$ ), VT (vitality;  $p < 0.05$ ), and MH (mental health;  $p < 0.001$ ) (Fig. 6).

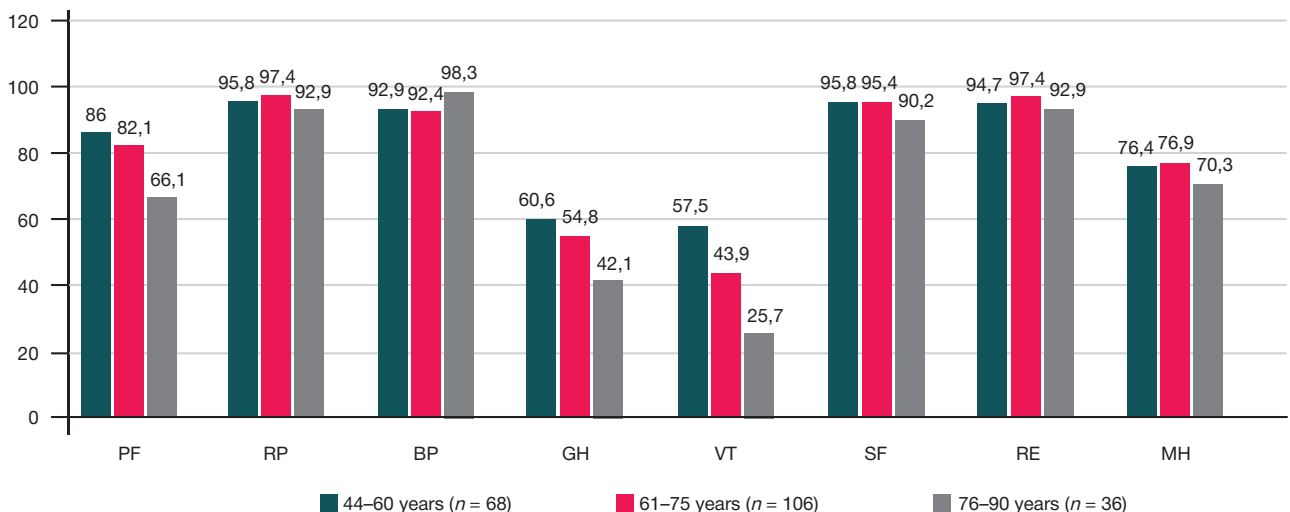


Fig. 2. QOL indicators in the residual stroke period in patients of different age



Fig. 3. QOL indicators in the residual stroke period in male and female patients

## DISCUSSION

Our study revealed that some QOL parameters declined with advancing age. The lowest QOL scores were observed in the age group above 75 years, which is consistent with other reports [23]. The highest scores on SF-36 scales were demonstrated by middle-aged patients (44–60 years). At the same time according to another publication, it was this age group (45–64 years) where the QOL decline was the most dramatic, perhaps due to the suddenness of stroke, its profound impact on all aspects of life and the unpreparedness of the patients to deal with stress [11]. Another study did not report any associations between QOL deterioration and age [10].

The pronounced decline in all QOL indicators observed 3 years after stroke in female patients was previously reported by other researchers. For example, a study showed that men had higher physical component summary scores on days 10 and 180 after stroke than women [10]. Some sex-related differences were observed by other researchers in the acute stroke period and during early poststroke rehabilitation [9]. Perhaps, the underlying reason is a more severe depression in women than in men.

Low general health (GH) and vitality (VT) scores in patients with a left hemispheric stroke resulting from carotid artery occlusion might be due to right-hemisphere motor deficit. For example, patients with a VB stroke had a stronger (by 20%) motivation to work towards recovery than those with a hemispheric stroke [15]. Motivation is often the key to

effective rehabilitation, which was also confirmed by our study: the highest scores on the majority of the applied subscales were observed in patients with VB strokes. Low PF (physical function), RP (physical role functioning) and RE (emotional role functioning) scores observed in patients with a right MCA stroke suggest a more profound impact of the right hemispheric lesion on the psychoemotional state; this observation was previously reported by other authors [14–16] and is confirmed by our study. The highest QOL scores demonstrated by patients with a vertebrobasilar stroke might be associated with less severe neurological deficit in the acutest stroke period and at the end of the acute stroke period before discharge.

Our study confirmed the effectiveness of complex non-pharmacological rehabilitation programs [18, 19], which was illustrated by high scores on most SF-36 subscales in the acute and residual stroke periods following the inclusion of AP into the early rehabilitation regimen resulting in the improved physiological and emotional state of our patients. The high effectiveness of poststroke rehabilitation at RH is consistent with the literature reports on the advantages of sanitarium vs. outpatient rehabilitation [20, 21, 24].

## CONCLUSION

Our study has identified a few predictors of poor quality of life after stroke in the residual stroke period, including age over 60 years, female sex and strokes in the MCA territory. A relatively better outcome can be expected for younger patients under 60

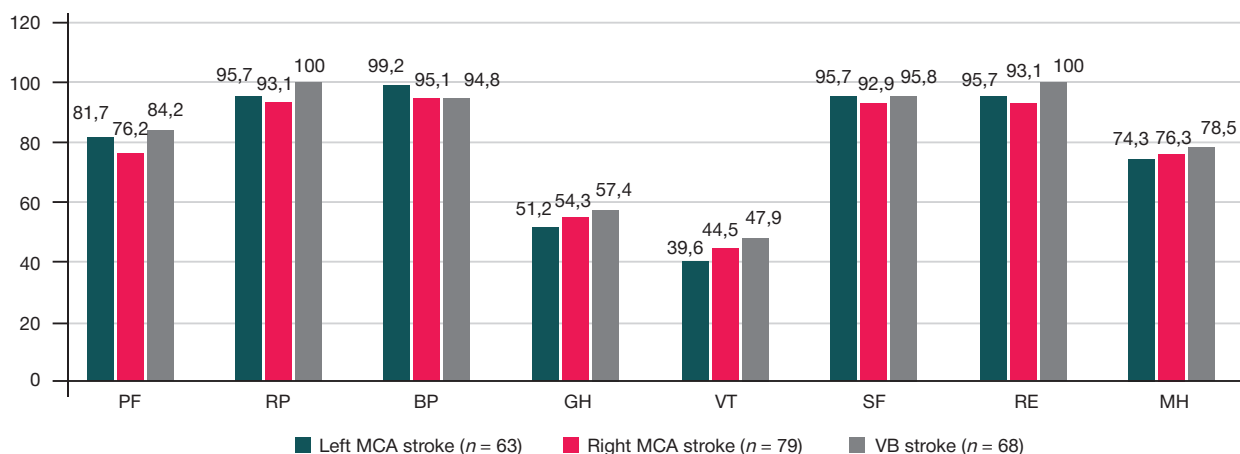


Fig. 4. QOL indicators in the residual stroke period for patients with different lesion locations

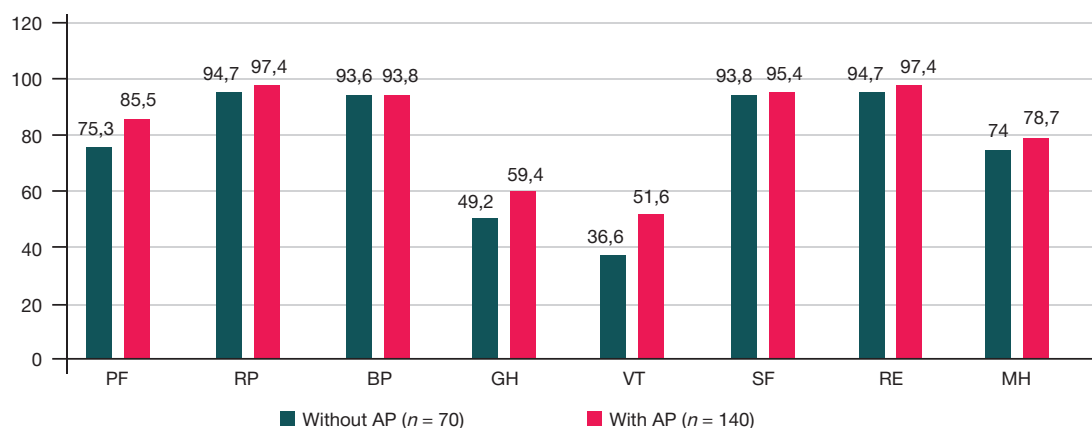


Fig. 5. QOL indicators in the acute stroke period in patients undergoing different types of rehabilitation

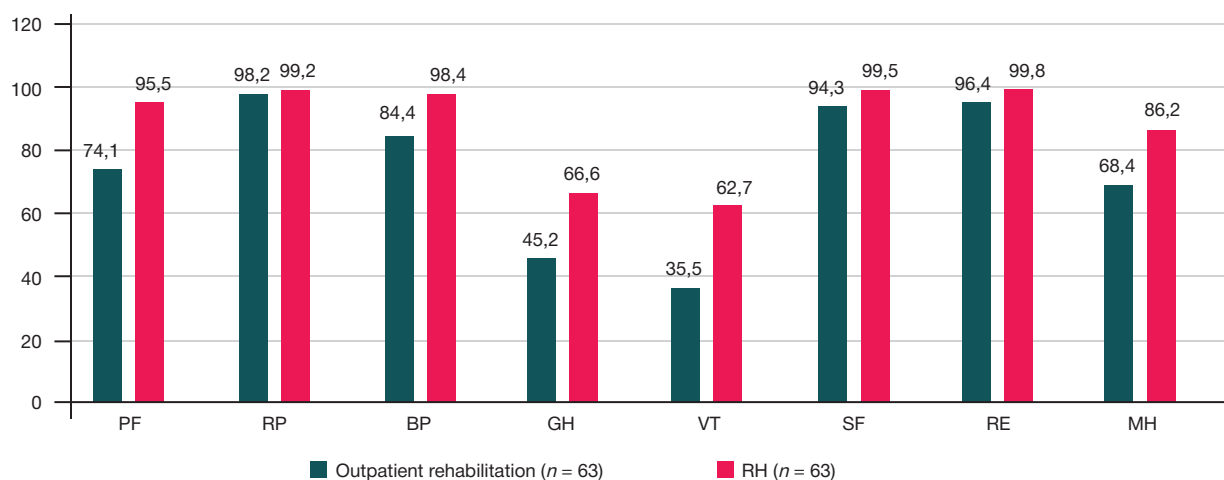


Fig. 6. QOL indicators 3 years after stroke depending on the type of rehabilitation after discharge from the hospital

years, men, patients with VB strokes and those who undergo rehabilitation complemented with acupuncture in the acute stroke period and continue rehabilitation in specialized inpatient facilities.

Understanding factors that affect QOL in stroke patients can help to predict the success of rehabilitation programs and improve their effectiveness. Discrepancies between our findings and data produced by other studies necessitates further research.

## References

- Portegies ML, Koudstaal PJ, Ikram MA. Cerebrovascular disease. *Handb Clin Neurol.* 2016; 138: 239–61.
- Skvorcova VI, Ivanova GE, Stahovskaja LV. Vozmozhnosti rasshirenija rea-bilitacionnogo potenciala bol'nyh s cerebral'nym insultom. *Russkij medicinskij zhurnal.* 2011; 19 (9): 579–83. Russian.
- Panteleenko LV. Kachestvo zhizni na protjazhenii goda posle ishemicheskogo in-sul'ta. *Ukrainskij nevrologicheskij zhurnal.* 2010; 3 (16): 73–79. Russian.
- Lukjanichikova LV. Sovremennij vzgljad na problemu kachestva zhizni bol'nyh, perenessih ishemiceskij insult. *Vestnik JuUrGU. Serija «Psihologija».* 2016; 9 (4): 64–72. Russian.
- Roche N. Auto-rehabilitation at home for stroke patients. *Ann Phys Rehabil Med.* 2016; Sep; 59S: e38.
- Belskaja GN, Stepanova SB. Vosstanovlenie narushennyh funkcij u bol'nyh icheskim insultom, proshedshih sanatornoe dolechivanie. *Nevrologicheskij zhurnal.* 2009; (3): 33–36. Russian.
- Suslina ZA, Varakin YuYa., Vereshhagin NV Kliniko-jepidemiologicheskie issledovaniya — perspektivnoe napravlenie izuchenija cerebral'noj patologii (soobshhenie pervoe). *Annaly nevrologii.* 2009; (3): 4–11. Russian.
- Agapov AB. Ocenka kachestva zhizni s pomoshh'ju oprosnikov u pacientov s zabolevanijem ven nizhnih konechnostej. *Rossiiskij mediko-biologicheskij vestnik imeni akademika I.P. Pavlova.* 2015; (3): 126–33. Russian.
- Tjukov YuA, Kochetkova NG, Ryzhij AP, Salavatov RR, Plastovec AI. Ocenka kachestva zhizni u bol'nyh posle perenesennogo insulta. *Medicinskaja nauka i obrazovanie Urala.* 2011; 12 (1): 186–8. Russian.
- Medvedkova SA. Dinamika pokazatelej kachestva zhizni bol'nyh v rannem vosstanovitel'nom periode mozgovogo ishemiceskogo polusharnogo insulta. *Mezhdunarodnyj nevrologicheskij zhurnal.* 2013; 4 (58): 15–22. Russian.
- Almborg AH, Ulander K, Thulin A, Berg S. Discharged after stroke-important factors for health-related quality of life. *J Clin Nurs.* 2010; 19 (15–16): 2196–206.
- Lukjanichikova LV. Vlijanie kachestva zhizni na reabilitacionnyj potencial bol'nyh, perenessih ishemiceskij insult [dissertation]. Cheljabinsk, 2018. Russian.
- Langhammer B, Sunnerhagen KS, Stanghelle JK, Sällström S, Becker F, Fugl-Meyer K. Life satisfaction in persons with severe stroke — A longitudinal report from the Sunnaas International Network (SIN) stroke study. *European Stroke Journal.* 2017; 2 (2): 154–62.
- Razumov AN, Melnikova EA. Kompleksnyj podhod k ocenke reabilitacionnogo prognoza u bol'nyh, perenessih insult. *Kurortnaja medicina.* 2015; (4): 14–19. Russian.
- Melnikova EA. Klinicheskaja harakteristika reabilitacionnogo potenciala u bol'nyh s insultom. *Kurortnaja medicina.* 2015; (4): 49–56. Russian.

16. Razumov AN, Melnikova EA, Rassulova MA, Rud IM. Nejrofunkcional'nye os-novy vosstanovlenija psihomotornyh funkcij u bol'nyh, perenessih insul't. V sbornike: Materialy Mezhdunarodnoj nauchno-prakticheskoj konferencii «Voprosy vosstanovitel'noj i sportivnoj mediciny» 15 nojabrja 2017; Moskva. Moskovskij nauchno-prakticheskij centr medicinskoj rehabilitacii, vosstanovitel'noj i sportivnoj mediciny departamenta zdravoohraneniya g. Mosky, 2017: 6–10. Russian.
17. Kislicyn YuV, Konopatkina IYu. Sravnitel'naja harakteristika kachestva zhizni bol'n-yh, perenessih aterotromboticheskij insul't v karotidnom i vertebrobaziljarnom bassejnah. Permskij medicinskij zhurnal. 2016; 33 (2): 30–33. Russian.
18. Solonec IL, Efremov VV. Kachestvo zhizni kak prediktor jeffektivnosti reabli-tacionnyh meroprijatij postinsul'tnyh bol'nyh. Fundamental'nye issledovanija. 2013; 12 (1): 76–80. Russian.
19. Solonec IL. Ocenka kachestva zhizni bol'nyh s narusheniem funkcii dvizhenija v rannem vosstanovitel'nom periode cerebral'nogo insul'ta v processe kompleksnoj reabilitacii [dissertation]. Rostov-na-Donu, 2016. Russian.
20. Belskaja GN, Lukjanchikova LV. Kachestvo zhizni, trevozhno-depressivnoe rasstrojstvo i kognitivnye funkcii na fone vosstanovitel'nogo lechenija ishemicheskogo insul'ta. Saratovskij nauchno-meditsinskij zhurnal. 2017; 13 (1): 51–57. Russian.
21. Ismajlov EE, Esen LM, Zhanysbaev ZhZ, Isaeva UA. Dinamika kachestva zhizni bol'nyh v ostrom i podostrom periodah ishemicheskogo insul'ta. Vestnik KazN-MU. 2016; (2): 241–3. Russian.
22. Ware JE. The MOS 36-item short-form health survey (SF-36). Medical Care. 1992; 30 (6): 473–83.
23. Kelly-Hayes M. Influence of age and health behaviors on stroke risk: lessons from longitudinal studies. J Am Geriatr Soc. 2010; 58 (2): 325–8.
24. Abdullina DU. Mediko-social'naja jeffektivnost' reabilitacii bol'nyh posle insul'ta v uslovijah sanatorija [dissertation]. Moskva, 2009. Russian.

## Литература

1. Portegies ML, Koudstaal PJ, Ikram MA. Cerebrovascular disease. Handb Clin Neurol. 2016; 138: 239–61.
2. Скворцова В. И., Иванова Г. Е., Стаховская Л. В. Возможности расширения реабилитационного потенциала больных с церебральным инсультом. Русский медицинский журнал. 2011; 19 (9): 579–83.
3. Пантелеенко Л. В. Качество жизни на протяжении года после ишемического инсульта. Украинский неврологический журнал. 2010; 3 (16): 73–79.
4. Лукьянчикова Л. В. Современный взгляд на проблему качества жизни больных, перенесших ишемический инсульт. Вестник ЮУрГУ. Серия «Психология». 2016; 9 (4): 64–72.
5. Roche N. Auto-rehabilitation at home for stroke patients. Ann Phys Rehabil Med. 2016; Sep; 59S: e38.
6. Бельская Г. Н., Степанова С. Б. Восстановление нарушенных функций у больных ишемическим инсультом, прошедших санаторное долечивание. Неврологический журнал. 2009; (3): 33–36.
7. Суслина З. А., Варакин Ю. Я., Верещагин Н. В. Клинико-эпидемиологические исследования — перспективное направление изучения церебральной патологии (сообщение первое). Анналы неврологии. 2009; (3): 4–11.
8. Агапов А. Б. Оценка качества жизни с помощью опросников у пациентов с заболеванием вен нижних конечностей. Российский медико-биологический вестник имени академика И. П. Павлова. 2015; (3): 126–133.
9. Тюков Ю. А., Кочеткова Н. Г., Рыжий А. П., Салаватов Р. Р., Пластовец А. И. Оценка качества жизни у больных после перенесенного инсульта. Медицинская наука и образование Урала. 2011; 12 (1): 186–8.
10. Медведкова С. А. Динамика показателей качества жизни больных в раннем восстановительном периоде мозгового ишемического полушарного инсульта. Международный неврологический журнал. 2013; 4 (58): 15–22.
11. Almborg AH, Ulander K, Thulin A, Berg S. Discharged after stroke—important factors for health-related quality of life. J Clin Nurs. 2010; 19 (15–16): 2196–206.
12. Лукьянчикова Л. В. Влияние качества жизни на реабилитационный потенциал больных, перенесших ишемический инсульт [диссертация]. Челябинск, 2018.
13. Langhammer B, Sunnerhagen KS, Stanghelle JK, Sällström S, Becker F, Fugl-Meyer K. Life satisfaction in persons with severe stroke — A longitudinal report from the Sunnaas International Network (SIN) stroke study. European Stroke Journal. 2017; 2 (2): 154–62.
14. Разумов А. Н., Мельникова Е. А. Комплексный подход к оценке реабилитационного прогноза у больных, перенесших инсульт. Курортная медицина. 2015; (4): 14–19.
15. Мельникова Е. А. Клиническая характеристика реабилитационного потенциала у больных с инсультом. Курортная медицина. 2015; (4): 49–56.
16. Разумов А. Н., Мельникова Е. А., Рассулова М. А., Рудь И. М. Нейрофункциональные основы восстановления психомоторных функций у больных, перенесших инсульт. В сборнике: Материалы Международной научно-практической конференции «Вопросы восстановительной и спортивной медицины» 15 ноября 2017 г.; Москва. Московский научно-практический центр медицинской реабилитации, восстановительной и спортивной медицины департамента здравоохранения г. Москвы, 2017: 6–10.
17. Кислицын Ю. В., Конопаткина И. Ю. Сравнительная характеристика качества жизни больных, перенесших атеротромботический инсульт в каротидном и вертебробазиллярном бассейнах. Пермский медицинский журнал. 2016; 33 (2): 30–33.
18. Солонец И. Л., Ефремов В. В. Качество жизни как предиктор эффективности реабилитационных мероприятий постинсультных больных. Фундаментальные исследования. 2013; 12 (1): 76–80.
19. Солонец И. Л. Оценка качества жизни больных с нарушением функции движения в раннем восстановительном периоде церебрального инсульта в процессе комплексной реабилитации [диссертация]. Ростов-на-Дону, 2016.
20. Бельская Г. Н., Лукьянчикова Л. В. Качество жизни, тревожно-депрессивное расстройство и когнитивные функции на фоне восстановительного лечения ишемического инсульта. Саратовский научно-медицинский журнал. 2017; 13 (1): 51–57.
21. Исмаилов Е. Е., Есен Л. М., Жанысбаев Ж. З., Исаева У. А. Динамика качества жизни больных в остром и подостром периодах ишемического инсульта. Вестник Казанского МУ. 2016; (2): 241–3.
22. Ware JE. The MOS 36-item short-form health survey (SF-36). Medical Care. 1992; 30 (6): 473–83.
23. Kelly-Hayes M. Influence of age and health behaviors on stroke risk: lessons from longitudinal studies. J Am Geriatr Soc. 2010; 58 (2): 325–8.
24. Абдуллина Д. У. Медико-социальная эффективность реабилитации больных после инсульта в условиях санатория [диссертация]. Москва, 2009.