Functional Capacity of Geriatric Patients after Stroke According to the NOSGER Scale. Prospective Studies

Wydolność czynnościowa pacjentów geriatrycznych po przebytym udarze mózgu w ocenie skalą NOSGER — badania prospektywne

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Abstract

Introduction. In Poland and in other European countries, we are witnessing an increase in the number of elderly (geriatric) people. The psychophysical assessment of the patient and the identification of deficits in his functioning in everyday life are of particular importance. The fitness of the elderly depends on their aging process, lifestyle, environmental, social and psychological factors as well as existing diseases — including neurological ones.

Aim. The aim of the study was to perform a functional assessment of geriatric patients after stroke using the NOSGER scale.

Material and Methods. The study group consisted of 117 geriatric patients after a stroke, hospitalized in the Department of Geriatrics, CM in Bydgoszcz. The NOSGER scale, the ADL-Katz scale and the Barthel scale were used for functional assessment.

Results. The conducted psychophysical assessment of geriatric patients using the NOSGER scale showed that the respondents function the worst in the area of social behaviour — S (M=15.2) and the instrumental activity of daily living — IADL (M=14.2). They function best in the area of destructive, disruptive and asocial behaviours — Z (M=8.1) and in the area of activities of daily living — ADL (M=9.2). The respondents best cope with activities such as: proper dressing when leaving the house (75.2% of respondents), performing hygienic activities (combing, shaving, make-up) (59.0% of respondents) or keeping order (58.1% of respondents). They are worse at such activities as: control of stool (30.8% of respondents) and urine control (31.6% of respondents). Statistical analysis showed no statistically significant differences (p>0.05) between the groups as assessed by the NOSGER, ADL-Katz and BI scales. A strong correlation was demonstrated between the assessment of the respondents using the ADL-Katz and Barthel scales (r=−.7128 and r=−.7285), and the NOSGER scale and the area — ADL_NOSGER (r=−.8109 and r=−.8215).

Conclusions. Geriatric patients after stroke, as assessed by the NOSGER scale, show moderate disability in the functional area. In most cases, the respondents cope well with such activities as: proper dressing when leaving the house, performing hygienic activities (combing, shaving, make-up) or taking care of order. Conformity was demonstrated in the functional assessment using the ADL_NOSGER, ADL-Katz and Barthel scales. The ADL-Katz scale and the Barthel scale similarly measure the activities of daily living of geriatric patients. **(JNNN 2021;10(2):51–57)**

Key Words: ADL-Katz scale, functional assessment, geriatric patient, Index Barthel, NOSGER scale, stroke

Streszczenie

Wstęp. W Polsce i w innych krajach europejskich jesteśmy świadkami wzrostu ilości ludzi w podeszłym wieku (geriatrycznych). Szczególne znaczenie ma ocena psychofizyczna chorego oraz określenie deficytów jego funkcjonowaniu w życiu codziennym. Sprawność osób w podeszłym wieku zależy od ich procesu starzenia się, stylu życia, czynników środowiskowo-społecznych, psychicznych i występujących schorzeń, w tym neurologicznych.

Cel. Celem badań było dokonanie oceny czynnościowej pacjentów geriatrycznych po przebytym udarze mózgu za pomocą skali NOSGER.

Materiał i metody. Badaną grupę stanowiło 117 pacjentów geriatrycznych po przebytym udarze mózgu, hospitalizowanych w Klinice Geriatrii CM w Bydgoszczy. Do oceny czynnościowej zastosowano skalę NOSGER, skalę ADL-Katz oraz skalę Barthel.

Wyniki. Przeprowadzona ocena psychofizyczna pacjentów geriatrycznych za pomocą skali NOSGER wykazała, że badani najgorzej funkcjonują w obszarze zachowań socjalnych — S (M=15,2) oraz złożonych czynności dnia codziennego — IADL (M=14,2). Najlepiej funkcjonują w obszarze zachowań destrukcyjnych, zakłócających, asocjalnych — Z (M=8,1) oraz w obszarze podstawowych czynności dnia codziennego — ADL (M=9,2). Badani najlepiej radzą sobie z takimi czynnościami jak: prawidłowy ubiór przy wychodzeniu z domu (75,2% badanych), wykonywanie czynności higienicznych (uczesanie się, ogolenie, umalowanie) (59,0% badanych) czy dbanie o porządek (58,1% badanych). Gorzej radzą sobie z takimi czynnościami jak: kontrola oddawania stolca (30,8% badanych) i moczu (31,6% badanych). Analiza statystyczna nie wykazała różnic istotnych statystycznie (p>0,05) pomiędzy poszczególnymi grupami w ocenie skalą NOSGER, ADL-Katz i BI. Wykazano, silną korelację pomiędzy oceną badanych za pomocą skali ADL-Katz oraz Barthel (r=−,7128 oraz r=−,7285), a skalą NOSGER i obszarem — ADL_NOSGER (r=−,8109 oraz r=−,8215).

Wnioski. Pacjenci geriatryczni w ocenie dokonanej za pomocą skali NOSGER wykazują umiarkowaną niesprawność w obszarze czynnościowym. W większości przypadków, badani dobrze radzą sobie z takimi czynnościami jak: prawidłowy ubiór przy wychodzeniu z domu, wykonywanie czynności higienicznych (uczesanie się, ogolenie, umalowanie) czy dbanie o porządek. Wykazano zgodność w ocenie czynnościowej za pomocą skali ADL_NOSGER, skali ADL-Katz i skali Barthel. Skala ADL-Katz oraz skala Barthel w podobny sposób mierzy aktywność życia codziennego pacjentów geriatrycznych. **(PNN 2021;10(2):51–57)**

Słowa kluczowe: skala ADL-Katz, ocena czynnościowa, pacjent geriatryczny, Index Barthel, skala NOSGER, udar mózgu

Introduction

In Poland and in other European countries, we are witnessing an increase in the number of elderly (geriatric) people. Polish society is one of the fastest aging in the European Union (EU). By 2060, the share of people aged 65–79 in the population is expected to double, and those aged over 80 — even threefold. Thus, the percentage of people in retirement age will increase abruptly from 14.0% in 2015 to 27.8% in 2060 [1]. Almost 65% of the European population aged over 65 suffer from at least two chronic diseases. The analysis of the Ja-Chrondis project [2] shows that in European countries, 65% of people over the age of 65 suffer from chronic diseases. In the case of people over the age of 85, this percentage rises to 85%. The results in the Polish population are similar — 60% of people in the 60–69 cohort and nearly 80% in the cohort over 79 years of age suffer from chronic diseases [3]. The group of these diseases most often diagnosed in the elderly include: cardiovascular diseases (arterial hypertension and ischemic heart disease), diseases of the respiratory system, diabetes, osteoporosis and gout, deterioration of sight and hearing, and cognitive disorders [4].

A comprehensive geriatric assessment includes an assessment of the functional status, physical health, mental and emotional abilities, and social and environmental conditions of the senior. It is performed with the use of clinimetric tools [5]. The psychophysical assessment of the patient and the determination of deficits in his functioning in everyday life are of particular importance. The fitness of the elderly depends on their aging process, lifestyle, environmental, social and psychological factors as well as existing diseases, including neurological ones.

The aim of the study was to perform a functional assessment of geriatric patients after stroke using the NOSGER scale.

Material and Methods

The research was carried out in the Geriatrics Clinic on a group of 117 patients who had suffered a stroke. The criteria for enrolment in the study were:

1. age — 65 years of age and more,
2. a history of stroke within a period of not less than 6 months from the time of the study and not longer than 36 months, and
3. verbal communication skills.

The criteria for excluding people from the research were:

1. age — under 65 years of age,
2. a history of stroke within less than 6 months and more than 36 months from the time of the study, and
3. problems in verbal communication (aphatic disorders).

The characteristics of the study group are presented in Table 1.

The functional evaluation was performed on the day of admitting the patient to the geriatric ward. For this purpose, standardized research tools were used — Nurses' Observation Scale for Geriatric Patients — NOSGER, Activities of Daily Living by Katz — ADL and Barthel Index — BI.

Table 1. Characteristics of the study group

Variable	N	%
Gender		
Women	68	58.1
Men	49	41.9
Age		
65–74 years	51	43.6
75–89 years	57	48.7
90 years and more	9	7.7
Place of residence		
City	86	73.5
Village	31	26.5
Education		
Primary	27	23.0
Vocational	39	33.3
Secondary	43	36.8
Higher	8	6.9

The Nurses' Observation Scale for Geriatric Patients (NOSGER) is a tool enabling quick and easy assessment of the physical, psychological, mental and social condition of a patient [6,7]. Six areas are assessed:

1. memory [P];
2. instrumental activities of daily living [IADL];
3. activities of daily living [ADL];
4. moods and emotions [NE];
5. social behaviour [S];
6. destructive, disruptive, asocial behaviour [Z].

Scale values are specified with numbers from 1 (always) to 5 (never). A patient can get a minimum of 30 points, a maximum of 150 points. The greater the number of points obtained in the observation, the worse the patient's condition is. It is assumed that respondents are considered healthy if they score no more than 75 points [8]. A detailed analysis of the application of the NOSGER scale in Polish conditions was carried out for the first time by Fidecki et al. [9], presenting the obtained results in several scientific publications. For the purposes of statistical analyses, the following criteria were adopted to classify the patient: group I (75 points or less) — healthy patients; group II (76 points and more) — dick patients.

The Katz scale (Activities of Daily Living by Katz — ADL) [10] is the most popular tool to assess the daily activities of chronically ill patients and the elderly. Highest final score — 6 points proves that the person is capable of performing the basic activities to the full extent. Declining scores indicate deterioration of functional performance. The psychometric properties of the scale are satisfactory in all respects (reliability and validity), consistently pointing to the great usefulness of the scale in the functional assessment of older people [11]. For the purposes of statistical analyses, the following criteria were adopted to classify the patient: group I (6–5 points) — activities fully preserved; group II (4–3 points) — moderate disability and group III (2–0 points) — severe functional impairment.

The Barthel scale (Barthel Index — BI) [12] is by far the most common method of assessing Activities of Daily Living (ADL) in patients with nervous system disorders. By awarding a certain number of points 0, 5, 10, 15, the self-service ability is assessed. The internal consistency coefficient for the original version of the scale, according to various studies, ranges from 0.87 to 0.90; validity coefficient for other scales from 0.65 to 0.69 [5]. For the needs of statistical analyses, the following criteria were adopted to classify the patient: group I (100–86 points) — slight limitation of fitness, group II (85–21 points) — moderate limitation of fitness, group III (20–0 points) — severe limitation efficiency.

Statistical Analysis

The obtained results were statistically analysed with the use of Excel and STATISTICA v 12.0 (StatSoft, Poland). The values of the analysed measurable parameters were presented by means of the mean (M), median (Me) and standard deviation (SD) values, and for non-measurable ones by the number (N) and percentage (%). For measurable features, the normal distribution of the analysed parameters was assessed using the Shapiro–Wilk test. The agreement between the individual groups was analysed using the chi-square test. The relationships between the results of the NOSGER scales and other tools were assessed on the basis of the r-Pearson correlation coefficient (r). A significance level of $p < 0.05$ was adopted, indicating the existence of statistically significant differences or relationships.

Ethics Committee

The research was carried out after obtaining the consent of the Bioethics Committee operating at the Nicolaus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz. The research was voluntary, free and anonymous. Before proceeding to research, the participants read the prepared instructions and information for the participant of the scientific research. They also signed informed consent to participate in the study. Respondents were informed that their results would be used for research purposes only.

Results

Based on the obtained research results, the psychophysical assessment of geriatric patients was presented using the NOSGER scale and its individual areas. The average assessment of the functioning of older people on the NOSGER scale was 68.2 out of 150 points awarded to the maximum. The highest value shows the area S — social behaviours (M=15.2; SD=5.3) and IADL — instrumental activities of daily living (M=14.2; SD=5.7). Subsequently, the following areas: P — memory (M=11.4; SD=4.5), NE — moods and emotions (M=10.1; SD=3.5), ADL — activities of daily living (M=9.2; SD=5.7) and Z — destructive, disruptive, asocial behaviour (M=8.1; SD=3.0).

Table 2. Assessment on the NOSGER scale — mean values of areas

NOSGER scale	M	SD
NOSGER	68.2	32.6
ADL — activities of daily living	9.2	5.7
IADL — instrumental activities of daily living	14.2	5.7
NE — moods and emotions	10.1	3.5
Z — destructive, disruptive, asocial behaviour	8.1	3.0
S — social behaviours	15.2	5.3
P — memory	11.4	4.5

Detailed analysis of the ADL_NOSGER area (Table 3) — activities of daily living concerned 5 issues/questions. In question 1. Can shave/do make-up/comb hair without help, the largest group of respondents stated that they "always" perform these activities (69 people — 59.0%), while the answer "never" was given by 23 people (19.7%). In question 7. Stool is controlled, the largest group of respondents indicated the answer "always" (40 people — 34.2%), while the answer "never" was given by 36 people (30.8%). In question 14. He gives the impression of a clean and tidy person, the largest group of respondents indicated the answer "always" — 68 people (58.1%), the smallest group of respondents answered "often" (6 people — 5.1%). In question 18, the answers were reversed in relation to the remaining ones, the variants correspond to: 1 — never, 2 — sometimes, 3 — often, 4 — most often, 5 — always. To the question Leaves the house incompletely or improperly dressed — the largest group of respondents answered "never" (88 people — 75.2%), the smallest group of respondents gave the answer "always" (1 person — 0.9%). In question 24. Controls urination, the largest group of respondent gave the answer "never" (37 people — 31.6%). The answer "always" was given by 32 people (27.4%).

The compliance of the assessments of respondents on the NOSGER scale with the scores on the ADL-Katz and BI scales was also analysed (Table 4). On the basis of the research carried out using the NOSGER scale, it

Table 3. Assessment of the ADL area — activities of daily living

Answer	1		2		3		4		5	
	N	%	N	%	N	%	N	%	N	%
Question no. 1. Can shave/do make-up/comb hair without hel	always		most often		often		sometimes		never	
	69	59.0	6	5.1	8	6.8	11	9.4	23	19.7
Question no. 7. Stool is controlled	always		most often		often		sometimes		never	
	40	34.2	13	11.1	4	3.4	24	20.5	36	30.8
Question no. 14. He gives the impression of a clean and tidy person	always		most often		often		sometimes		never	
	68	58.1	19	16.3	6	5.1	9	7.7	15	12.8
Question no. 18. Leaves the house incompletely or improperly dressed	never		sometimes		often		most often		always	
	88	75.2	15	12.8	8	6.8	5	4.3	1	0.9
Question no. 24. Controls urination	always		most often		often		sometimes		never	
	32	27.4	20	17.1	13	11.1	15	12.8	37	31.6

Table 4. Patient assessment results using the NOSGER, ADL-Katz, BI scales

Group	Scale					
	NOSGER		ADL-Katz		BI	
	N	%	N	%	N	%
I	85	72.7	40	34.2	18	18.0
II	32	27.3	31	26.5	61	52.1
III	–	–	46	39.3	35	29.9

chi-square test=12.385; p=0.285

was shown that the largest group are healthy people (85 of respondents — 72.7%), the remaining group is considered sick (32 of respondents — 27.3%). According to the ADL-Katz scale, the most numerous group are people who are very disabled, requiring 24-hour care (46 of respondents — 39.3%) and able-bodies seniors (40 of respondents — 34.2%). The remaining people were classified as moderately disabled (31 of respondents — 26.5%). Research indicates that according to the Barthel scale, the largest group of respondents are people in a moderately severe condition (61 of respondents — 52.1%). The smallest group are seniors in light condition (21 of respondents — 18.0%). The performed statistical analysis did not show any statistically significant differences between the groups (chi-square test=12.385; p=0.285), which means that individual subjects show similar functional status in individual groups.

A detailed analysis of the assessment of compliance of individual areas of the NOSGER scale with the assessment of the daily activities of patients assessed using the ADL and BI scales is presented in Table 5. Both in the ADL_NOSGER (M=9.2) and the ADL-Katz scale (M=3.4), moderate disability of respondents was indicated. In the case of the BI scale, the obtained results both in the ADL_NOSGER (M=9.2) and in the Barthel scale (M=52.5) indicate an average reduction in the efficiency of respondents.

Table 5. Assessment of ADL_NOSGER area and ADL-Katz scale as well as ADL_NOSGER and BI scale

Scale	M	Me	Min	Max	SD
ADL_NOSGER	9.2	11.0	5.0	24.0	5.7
ADL-Katz	3.4	3.5	0.0	6.0	2.0
BI	52.5	50.0	0.0	100.0	29.8

The performed statistical analysis showed strong correlations between the assessment of respondents using the ADL-Katz, BI scale and the entire NOSGER scale and its analysed area ADL_NOSGER (Table 6). For the ADL-Katz scale, the value of the correlation coefficient (r=−0.8109) between the scales indicates that there is a strong statistically significant (p<0.001) relationship between the ADL_NOSGER area scores and the ADL-Katz scores. For the BI scale, the value of the correlation coefficient (r=−0.8215) between the scales also indicates that there is a strong statistically significant (p<0.001) relationship between the ADL_NOSGER area scores and the Barthel scores. This means that both the ADL-Katz and BI scales similarly measure the activity of daily living of geriatric patients. Due to the inverted scoring in one of the scales, the relationship had a negative direction, which means that higher values of ADL_NOSGER areas correlated with lower values of the ADL-Katz scale and the BI scale. The results obtained in the ADL-Katz scale and in the BI scale assessing the efficiency of respondents in daily/everyday activities, therefore correspond to the results obtained in the ADL_NOSGER area.

Table 6. Correlation coefficient for the measurement with the ADL-Katz, BI, NOSGER, ADL_NOSGER scale

Scale	NOSGER	ADL_NOSGER
ADL-Katz	−0.7128	−0.8109
BI	−0.7285	−0.8215

Discussion

The conducted psychophysical assessment of geriatric patients using the NOSGER scale showed that the respondents function the worst in the area of social behaviour — S (M=15.2) and the instrumental activity of daily living — IADL (M=14.2). They function best in the area of destructive, disruptive and asocial behaviours — Z (M=8.1) and in the area of activity of daily living — ADL (M=9.2). Fidecki et al. [13] conducted a study in a group of 300 elderly patients staying in long-term care facilities throughout Poland. The study group was assessed using the NOSGER scale and six areas of the scale. The studies patients functioned best in the area of destructive, disruptive, asocial behaviour (7.83±2.58) and in the area of memory (10.38±3.81). Moods and emotions (12.18±4.39) and activities of daily living (13.19±5.31) scored slightly lower. The largest deficits were recorded in the field of social behaviour (14.42±5.16) and instrumental activities of daily living (16.74±4.82). The cognitive deficit contributes to the decline in functional efficiency, decreased independence, low quality of life and the need for care in stationary long-term care. The results of the research carried out by Skubal et al. [14] indicate that people with a greater degree of dementia were characterized by lower efficiency in performing basic everyday activities. Similar results were presented by Staszczak-Gawełda et al. [15] who showed that patients with diagnosed dementia had significant problems with performing basic self-care activities.

Geriatric patients, as assessed by the NOSGER scale, show moderate disability in the functional area. According to the ADL-Katz scale, the largest group are people who are very handicapped, requiring 24-hour care (39.3%) and non-disabled people (34.2%). The remaining people were classified as moderately disabled (26.5%). Research in a group of 122 residents of the Nursing Care Home showed similar results in the assessment of efficiency in everyday activities. It was shown that 77% of the patients were severely disabled, 19.7% were moderately disabled, and only 3.3% showed no disability [16]. The authors

of the study on a group of 127 residents of Kraków diagnosed with mild dementia indicate that nearly 60% of respondents were able to perform 6 activities on their own, assessed using the ADL-Katz scale [15]. According to the Barthel scale, Brudzińska [17], assessing the self-care capacity of elderly people in the home environment, stated that the highest percentage was classified as a light patient (54.0%), and the lowest — a very severe patient (5.0%). The mean score on the Barthel scale was — 77.95 points, which qualified the analysed group of respondents as a moderately severe patient.

Our own research showed a strong correlation between the assessment of the respondents using the ADL-Katz and Barthel scale (r=−.7128 and r=−.7285), and the NOSGER scale and the area — ADL_NOSGER (r=−.8109 and r=−.8215). The research of Luttenberg et al. [18] confirmed own research on the compliance of the ADL-Katz scale with the ADL-NOSGER area and the compliance of the ADL correlation with the IADL area.

Conclusions

Geriatric patients after a stroke, as assessed by the NOSGER scale, show moderate disability in the functional area.

In most cases, the respondents cope well with such activities as: proper dressing when leaving the house, performing hygienic activities (combing, shaving, make-up) or taking care of order.

Conformity was demonstrated in the functional assessment using the ADL_NOSGER scale, ADL-Katz scale and Barthel scale.

The ADL-Katz scale and the Barthel scale similarly measure the daily life activity of geriatric patients.

Implications for Nursing Practice

The NOSGER scale discussed in this study can be the basis for the assessment of geriatric patients with coexisting neurological disease. It allows for an objective analysis of patients' deficits, and thus enables the selection of appropriate care, nursing and therapeutic measures. The applied tool also demonstrates the comparability of the results of the assessment of individual areas of the NOSGER scale with the currently functioning measurement tools such as ADL-Katz or BI.

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