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The Level of Independence Among Seniors with a History of Ischemic Stroke

Poziom niezależności seniora po przebytym udarze niedokrwiennym mózgu

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Abstract

Introduction. Stroke is currently among the most dangerous civilization diseases and the most common cause of death and secondary disability in people over 65 years of age. Disease-related disability significantly affects all spheres of human functioning, leading to dependence on third parties' assistance. One of the most important activities to be undertaken in relation to a disabled patient is diagnosing the level of disability and implementing active efforts for the patient to regain optimal performance and/or accept the disability. Limitation in daily activities is a considerable stress factor that has a negative effect on the seniors' recovery and becomes a cause of institutionalization.
Aim. To investigate the impact of ischemic stroke on the level of independence in elderly people.
Material and Methods. Medical records of 186 patients of a neurological ward were analysed. The majority of participants were women (55.91%), seniors aged 76–85 (36.02%), living in a city (55.38%) and being widowed (41.93%). The standardized Norton and Tinetti scales were applied in the analyses.
Results. The most important factors influencing the incidence and course of stroke were the patient's age and the presence of concomitant diseases: diabetes (81.72%) and arterial hypertension (73.65%). Among the stroke complications, the majority of patients presented aphasia (76.88%), hemiparesis (67.20%), dysphagia (63.44%) and urinary bladder dysfunction (60.21%). The study subjects were predominantly (86.56%) classified in the third category of care; 38.17% were referred for further rehabilitation in a post-hospital rehabilitation unit, 19.89% were referred to a medical care and treatment institution, and 19.36% died. The majority of the respondents achieved less than 14 points (77.96%) in the Norton scale and less than 19 points (34.41%) in the Tinetti scale.
Conclusions. Ischemic stroke reduces or completely terminates the patient's ability to function independently. The patient's age is of greatest significance for the level of his independence and functioning immediately after ischemic stroke. **(JNNN 2019;8(3):112–118)**
Key Words: ischemic stroke, disability, elderly people

Streszczenie

Wstęp. Udar mózgu jest obecnie jedną z najgroźniejszych w skutkach chorób cywilizacyjnych oraz najczęstszą przyczyną zgonu i niepełnosprawności wtórnej wśród osób po 65 r.ż. Niepełnosprawność wynikająca z choroby w znacznym stopniu narusza wszystkie sfery funkcjonowania człowieka, powodując uzależnienie od pomocy osób trzecich. Jednym z najistotniejszych działań podjętych w stosunku do pacjenta niepełnosprawnego jest zdiagnozowanie poziomu sprawności, podjęcie aktywnego dążenia do odzyskania optymalnej sprawności lub/i zaakceptowania przez niego niepełnosprawności. Ograniczenie w wykonywaniu codziennych czynności jest znaczącym czynnikiem stresogennym negatywnie wpływającym na powrót do zdrowia seniora oraz przyczyną instytucjonalizacji.
Cel. Zbadanie wpływu udaru niedokrwiennego mózgu na poziom niezależności osób w podeszłym wieku.
Materiał i metody. Analizie poddano dokumentacje medyczną 186 pacjentów oddziału neurologicznego. W badaniach przeważały kobiety (55,91%), większość stanowili seniorzy w przedziale wiekowym 76–85 lat (36,02%), pochodzący z miasta (55,38%), będący wdowami/wdowcami (41,93%). W analizach wykorzystano standaryzowane skale: Norton i Tinetti.

Wyniki. Najważniejszym czynnikiem wpływającym na zachorowalność oraz przebieg udaru mózgu okazał się wiek pacjenta oraz obecność chorób współistniejących: cukrzycy (81,72%) i nadciśnienia tętniczego (73,65%). Większość badanych miała powikłania poudarowe pod postacią afazji (76,88%), niedowładu połowiczego (67,20%), dysfagii (63,44%) i zaburzeń czynności pęcherza moczowego (60,21%). Ankietowani okazali się w większości (86,56%) zakwalifikowani do III kategorii opieki, dlatego 38,17% przekazano do dalszej rehabilitacji w poszpitalnym oddziale rehabilitacji, 19,89% zostało przekazanych do ZOL-u, a 19,36% zmarło. Większość badanych uzyskało w skali Norton poniżej 14 pkt. (77,96%), a w skali Tinetti poniżej 19 pkt. (34,41%).
Wnioski. Przebyty udar niedokrwienny mózgu powoduje obniżenie lub całkowite zniesienie możliwości samodzielnego funkcjonowania chorego. Wiek chorego odgrywa największą rolę w poziomie niezależności pacjenta oraz jego funkcjonowaniu bezpośrednio po udarze niedokrwiennym. **(PNN 2019;8(3):112–118)**
Słowa kluczowe: udar niedokrwienny, niepełnosprawność, osoby w podeszłym wieku

Introduction

Research shows that stroke is the world's second most common cause of secondary disability and, more importantly, of death among patients. In the United States, it affects about 650.000 people a year, and only half of them are discharged home after the end of the hospital treatment phase. The remaining patients, due to their disability, are referred to rehabilitation, long-term, or palliative care centres [1].

It is estimated that in Poland stroke affects ca. 175/100.000 men and 125/100.000 women, and the incidence increases with age. It equals to 13% among Poles aged 60–79 and 27% in those aged 80 and older. In the elderly, 87% of all stroke episodes are ischemic strokes, another 10% are intracerebral haemorrhages, and only 3% are subarachnoid haemorrhages.

Stroke is the second most common cause of dementia syndromes. According to WHO, it affects ca. 15 million people in the world every year. The incidence increases with age, and exceeds 8% among people aged over 65 [2].

The most important factors increasing the risk of ischemic stroke development are as follows: arterial hypertension (6-fold risk increase), diabetes, nicotine dependence (3-fold risk increase), hyperlipidaemia, application of agents that inhibit ovulation, and excessive alcohol consumption (2-fold risk increase) [3]. One should also consider such non-modifiable factors as race, sex and age. Black people, males, and those aged over 65 are more likely to be affected [4].

According to studies, 30% of seniors suffer from severe disability as a result of a stroke, 25% return to normal functioning, 15% require addressing their bio-psycho-social needs in institutional care centres, and the same percentage of patients die.

The condition of patients with ischemic strokes deteriorates owing to stroke progression, cerebral oedema, secondary bleeding to the ischemic focus, or as a consequence of another stroke incident [5].

A person with a stroke, especially in the elderly age, should take into account the irreversible changes that can occur in his life as a result of the disease. Most often, the patient's dependence on other people increases, which constitutes an additional burden for the patient and his family. This situation may lead to lowering moods, withdrawal from social life and even aggression. The recovery of physical performance after a stroke incident requires hard work and significant involvement of the patient and their environment [2]. The rehabilitation should start as soon as possible after the occurrence of the disturbing symptoms, preferably on the first day. The aim is to prevent the complications of the disease and to improve the patient's skills as quickly as possible [5].

The purpose of the paper was to analyse the impact of an ischemic stroke on the level of the patient's independence and disability.

Material and Methods

The study analysed medical records of 186 (100%) patients of the Province Hospital Centre of the Jelenia Góra Valley in Jelenia Góra, Poland, treated in the neurological ward with a stroke subdivision in years 2017 and 2018. The study was approved by the hospital management board.

The data collected for the analysis included age, sex, place of residence, and marital status. Two standardized scales were applied:

— The Norton scale, assessing the risk for pressure ulcers development. The scale was created by Doreen Norton, a nurse specialising in geriatric nursing, born in 1922. The scale evaluates, in points 1–4, the patient's physical condition, mental condition, activity, ability to change position independently, and the function of sphincter ani and urethral sphincters. The maximum score is 20 points; 14 points imply an increased risk for pressure ulcers, and the risk grows with scores below 14 points [6].
— The Tinetti scale, assessing the patient's balance and gait. The maximum score is 28 points, including 16 points in the balance domain and

12 in the gait-related one. Patients with scores above 24 points are regarded as not endangered with falls. Scores of 19–24 points imply a moderate, and scores below 19 points a high risk of fall.

Results

The majority of the studied patients were women, lived in a city, and were 76–85 years old (Table 1).

Table 1. Sociodemographic characteristics of the study group

Variable	N	%
Gender		
Woman	104	55.91
Man	82	44.09
Age		
65–75 years	55	29.57
76–85 years	67	36.02
86–95 years	51	27.42
95 years and more	13	6.99
Place of residence		
Urban	103	55.38
Rural	83	44.62
Marital status		
Bachelor/Maid	17	9.14
Widow/Widower	78	41.93
Divorced	27	14.52
Married	64	34.41

It turned out that gender and place of residence did not play a significant role in the occurrence of ischemic stroke. The patient's age was the most important factor influencing the incidence and course of stroke. The majority of the study participants were aged 76–85 (67; 36.02%).

The presence of concomitant diseases appeared equally significant: 81.72% (N=152) of the seniors had insulin-dependent diabetes and 73.65% (N=137) were diagnosed with arterial hypertension. Only 9.14% (N=17) did not suffer from any concomitant disease. It was also revealed that the majority of the elderly patients presented typical post-stroke complications. The associated necessity of further institutional care referral was stated in 1/5 of all study participants (Table 2).

The study also proved a relationship between the patients' age and their qualification to particular categories of care. None of the seniors aged over 86 was classified in the second category of care (Table 3).

Table 2. Post-stroke complications

Complications	N	%
Aphasia	143	76.88
Hemiparesis	125	67.20
Dysphagia	118	63.44
Urinary bladder dysfunction	112	60.21

Table 3. Category of care qualification

Age	Second category of care		Third category of care	
	N	%	N	%
65–75 years	20	10.75	32	17.20
76–85 years	5	2.69	47	25.27
86–95 years	0	0	63	33.87
95 years and more	0	0	19	10.21

The study analysed the relationship between the diagnosed ischemic stroke and the way of terminating treatment in the neurological ward. Out of the 186 (100%) investigated patients, 71 (38.17%) were referred for further rehabilitation in a post-hospital neurological rehabilitation unit, 42 (22.58%) were discharged home, 37 (19.89%) were referred to a medical care and treatment institution and 36 (19.36%) died.

We also examined the association between the course of the disease and the number of points scored by a patient in the Norton scale. Among the studied seniors, 92 (49.46%) obtained 6–13 points at the moment of admission, 53 (28.49%) received 5 points or less and 41 (22.04%) had 14–20 points.

As for the relationship between the patients' age and the number of points in the Norton scale, it turned out that subjects aged 65–75 scored 19–20 points at admission, those aged 76–85 obtained 14–18 points, the number of points decreased to the range of 6–13 in 86–95-year-olds, and seniors above 95 years of age received 0–5 points.

Additionally, we investigated the relationship between the diagnosis of ischemic stroke and the number of points in the Tinetti scale that the patient scored at discharge. From among the seniors whose medical records were analysed, 36 (19.36%) died. In the remaining group of 150 (80.64%) patients, 64 (34.41%) obtained 8–18 points, 37 (19.89%) had 19–21 points, 36 (19.35%) received 22–23 points and 18 (9.68%) scored 24 points.

The study also analysed the correlation between the patients' age and the number of points obtained in the Tinetti and Norton scales (Table 4).

Table 4. Points scored in the Tinetti and Norton scales

Age	Points in the Norton scale	Points in the Tinetti scale
65–75 years	16–20	19–24
76–85 years	14–18	17–21
86–95 years	6–13	13–18
95 years and more	0–5	8–15

Discussion

Ischemic stroke is one of the main causes of death worldwide and the most common reason for profound disability in people over 65 years of age. It is estimated that by 2025, the number of cases may increase by about 38% and the disease will mainly affect the elderly [7]. Stroke will significantly reduce the level of patients' self-reliance, making them largely dependent on third party care [8].

The presented study showed that the largest group of patients with diagnosed stroke were people aged over 76. At the same time, they received the lowest number of points in the Tinetti scale, which implies total disability or severe impairment. These results remain in line with numerous studies; among others, Kelly-Hayes et al. [9] revealed that the risk of stroke and the level of disability increased with age. Similar findings were presented by Wolf et al. [10], who pointed at an increase of incidence along with age, from ca. 3% in the age range of 65–69 years of age to almost 24% among 80–84-year-olds. These authors also indicated that the occurrence of an ischemic incident was not influenced by sex; men and women achieved the same risk level. Differences could only be observed in younger age groups, with the risk of stroke of almost 6% among young men and of 3% in young women. Similar conclusions were drawn from the study carried out for the purposes of this paper. This is also in line with results published by Mazurek et al. [11]. In turn, Petrea et al. [12] proved that there was no significant difference between stroke subtype, its severity, or mortality rate and the patient's sex. Similar results were obtained by Zawadzka et al. [13].

We also did not find any relationship between the patient's marital status and ischemic stroke incidence. This corroborates the results presented by Boden-Albala et al. [14].

This paper analysed the relationship between the occurrence of chronic diseases and of ischemic stroke. It has shown that insulin-dependent diabetes diagnosed in elderly people had an impact on the occurrence of the incident. This is supported by research performed by Zalisz [15], who proved that patients treated for diabetes were much more likely to have lacunar strokes and that their neurological deficit was significantly higher as compared with those not diagnosed with diabetes. Similar results were achieved by Baird et al. [16]; they observed that diagnosed diabetes had a direct impact on ischemic stroke incidence, and blood glucose concentration at the moment of ischemia occurrence influenced further disease course.

In the presented study, the majority of respondents were also diagnosed with arterial hypertension. As proved by Hu et al. [17], beside type 2 diabetes, arterial hypertension is a factor increasing the risk of stroke. The risk is drastically raised with the simultaneous occurrence of both diseases. Qureshi et al. [18], in turn, arrived at different results. They observed that arterial hypertension increased the risk of myocardial infarction and coronary artery disease, with no impact, however, on the incidence of stroke.

Stroke is the most common cause of acquired disability, which significantly affects the emotional sphere of the patient, leading to dependence on help from third parties and thus lowering self-esteem. Therefore, one of the most important activities to be undertaken in relation to a disabled patient is implementing efforts to regain optimal physical performance and/or accept the disability. Limitation in daily activities is a considerable stress factor with a negative effect on the recovery [19].

The results obtained with the analysis of the patients' medical records revealed that 1/5 of the subjects demanded institutional care because of complete disability. This is reflected in research performed by Schwamm et al. [20], as well as by Bońkowski and Klich-Rączka [21]. These studies confirm that the most common reason for recruitment of patients to medical care and treatment institutions is disability caused by stroke and that admission takes place directly from the so-called acute hospital wards. It was also noticed that women constituted a slightly bigger group of patients, a medical care and treatment institution stay lasted longer than six months, and half of all residents were people aged over 80, which confirms the results presented earlier.

As shown in this paper, at the time of admission to the neurological ward, the majority of seniors obtained less than 14 points in the Norton scale, which indicates very little or no independence at the moment of the ischemic incident. This translates into the level of patient's independence after the stroke. The study proved that one of the most common dysfunctions after a stroke was aphasia. Pedersen et al. [22] found that with the first stroke, 32% of aphasia cases represented global aphasia, 16% were affected by Wernicke's aphasia, and 12% suffered from Broca's aphasia. Ryglewicz and Milewska [23] observed that the problem of global aphasia concerned ca. 21% of patients with a history of ischemic stroke. Even higher rates were obtained by Pulvermüller et al. [24], who implied in their analyses

that aphasia affected ca. 38% of patients in the acute phase of stroke, and a spontaneous improvement of the speech function took place in the first weeks following the incident. Aphasia is a factor that directly affects the level of the patient's independence. The lack of free speech communication means that patients are socially excluded and have to rely on the help of third parties.

Another frequent complication of stroke is hemiparesis, which affected the majority of patients in the studied group. According to Kornet et al. [25], an upper limb paresis affects 80% of stroke patients, significantly reducing their independence. Disorders in the motor sphere result from damages to the motor cortex. Motor function decreases or becomes completely eliminated as a consequence of flaccidity, appearing in the first place, which later on transforms into hypertonia and spasticity. Data published by the World Stroke Organization indicate 20% mortality among post-stroke patients and permanent dysfunction due to walking difficulties. The problem affects 2/3 of the patients; as many as 30% experience severe motor disability and therefore require full care [26].

Among the motor disorders, those regarding upper limb mobility are the most troublesome for patients and contribute to the reduction of their performance. This has an impact on, among others, the seniors' personal hygiene, independent nutrition, as well as establishing and maintaining proper social contacts. Upper limb paresis affects 80% of post-stroke patients and is associated with long-term and intensive rehabilitation in most of them. One should remember that recovery takes much longer in this case than the improvement of lower limb function. Rehabilitation difficulties result both from errors in the care and therapy in the early post-stroke period and from natural causes, such as much less stimulation of the limb by its load [25].

The success of the rehabilitation, and thus the improvement of the patient's functioning, depend primarily on the earliest possible commencement of the procedures and on their intensity, which must be adapted to the patient's general condition and abilities. The most successful improvement can be achieved within the first 3 months after the occurrence of stroke. Full performance recovery is prevented by the dynamics of the disease, the location of brain lesions and their scale, but also by the concomitant diseases and the level of the patient's physical activity. After hospital treatment and rehabilitation in the hospital setting, seniors usually lose their skills progressively. Studies show that in 20% of them, both the upper and lower limb lose their function within 3 months from the end of treatment. Stopping exercise after a stroke at any stage can lead to a return to disability, so the patient must make the effort to perform exercises for life [27].

The analyses conducted within the presented study revealed that 60% of patients additionally suffered from the urinary bladder dysfunctions. Similar conclusions were reached by other authors. Son et al. [28] indicated that out of 94 examined patients, 25 were classified as patients with urinary retention. Foley et al. [29] also proved that urinary incontinence affected 21–79% of patients with a history of stroke incidents. In most cases, the complication disappears spontaneously ca. 8 weeks after the onset of the disease, and in less than 20% of patients it persists for up to 6 months. Urinary bladder dysfunction in the discussed group may lead to the urinary tract infection. The problem affects ca. 44% of patients, which has a direct impact on their poorer results in the process of recovery and leads to increased mortality [30].

Dysphagia is another disorder affecting people who underwent an ischemic stroke. In our research, this complication concerned 60% of patients hospitalized in the stroke ward. These results exceed those published by Falsetti et al. [31], who observed dysphagia in ca. 41% of all investigated stroke patients. Moreover, Smithard et al. [32] emphasize that among elderly people with diagnosed post-stroke dysphagia, the need for institutional care increases. The authors prove that the occurrence of dysphagia in the acute phase of stroke results in a decrease in the quality of patient's functioning in the year after the onset of the disease and is directly related to an increased institutionalisation factor later on.

The presented study revealed that almost all respondents were classified in the third category of care, which points at their complete disability and a deficit in addressing their bio-psycho-social needs. The second biggest group were classified in the second category of care, which implies a severe limitation of independence. None of the patients received the first category of care, denoting complete independence. This means that the majority of elderly people who underwent a stroke are unable to function on their own in terms of basic everyday activities.

Conclusions

1. The sociodemographic conditions do not influence the incidence of ischemic stroke.
2. Stroke is a condition which mainly affects the elderly.
3. The vast majority of patients with diagnosed ischemic stroke have one or more concomitant diseases increasing the risk of the occurrence of ischemic stroke.
4. Aphasia is the most frequent complication of ischemic stroke.
5. The majority of seniors who underwent a stroke need 24-hour care.

Implications for Nursing Practice

Due to the relationship between stroke and reduction or complete abolition of the patient's independence, two-way actions should be taken to improve the quality of life in the elderly. The first should be broad prevention against strokes based on the promotion of pro-health behavior as well as early diagnosis of co-morbidities. Primary Health Care employees, i.e. doctors and nurses, can play a significant role here. They can, thanks to the use of screening tests (e.g. senior physical examination, glucose level and blood pressure) diagnose different sorts of abnormalities at an early stage. This will allow for the implementation of prevention activities, permitting the development of diabetes and hypertensive disease, the major diseases leading to stroke. The second activity should be the education of the elderly, as well as their carers, whose main goal should be to maximize the period of independence of the senior. Providing information on activities that an elderly person can perform on their own, as well as those where they will require the help of third parties and the presentation of actions to facilitate the daily functioning of those under their care should contribute to improving the well-being of not only seniors but also their relatives. Making the patient and their family aware of the mechanisms of occurring ailments will help in understanding emerging situations, and thus will reduce the risk of institutionalization of older people.

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