

The Incidence Rate of Nervous System Disorders in Patients Above the Age of 65

Częstotliwość występowania chorób układu nerwowego w populacji osób powyżej 65 roku życia

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Abstract

Introduction. The most frequent diseases of people aged 60 or over are the diseases of cardiovascular system, musculoskeletal disorders and metabolic diseases. In the case of long-lived people the biggest risk is posed by acute inflammation and infections (e.g. pneumonia, flu) as well as the consequences of falls and broken bones. Among many factors, that significantly affect psychophysical capacity of these people, there should be mentioned health factors (e.g. diseases, some systems and organ disorders). This group also comprises nervous system disorders such as: vascular diseases, dementia and extrapyramidal disorders.

Aim. The aim of this work was to assess the incidence rate of the nervous system disorders and their influence on the psychophysical condition of people aged 65 or over.

Material and Methods. We conducted the study in the Clinic of Geriatrics Bydgoszcz, Poland. Participants included 127 patients hospitalized due to disease process. The criterion used for the selection of research participants was their age. They were divided into three subgroups in accordance with the subperiods distinguished by UNO (United Nations Organization): 65–74 (early old age), 75–89 (advanced old age), 90 and more (longevity). The scale used in the research is the standard scale that is most frequently used in nursing and clinic practice both in Poland and worldwide. We used the Activities of Daily Living (ADL) scale to assess everyday activities, Timed Up&Go Test (Up&Go) was used to assess the risk of falls, Geriatric Depression Scale (GDS) was used to point the risk of worsening of depression symptoms and Mini Nutritional Assessment (MNA) to assess the nutritional condition of the participants. The data that refers to sociodemographic and clinic variables was collected with the use of structured form used for data collection.

Results. The statistical analysis of the influence of the clinical diagnosis on psychophysical assessment of people aged over 65 showed that this factor is statistically significant ($p=0.031$) only with reference to functional condition assessed with the use of ADL scale. The results of the Up&Go scale ($p=0.214$), MNA ($p=0.324$) and GDS ($p=0.071$) were not statistically significant.

Conclusions. The nervous system disorders were classified for the second place in the context of polipathology which is characteristic for elderly people. In the research group the main disease, due to which the patient is hospitalized, did not significantly influence the psychophysical condition of people over the age of 65. (JNNS 2015;4(3):96–101)

Key Words: neurological disorders, elderly people, neurogeriatrics

Streszczenie

Wstęp. Do najczęściej występujących schorzeń u osób po 60. roku życia zalicza się choroby układu sercowo-naczyniowego, schorzenia układu ruchu i choroby metaboliczne. W przypadku osób długowiecznych istotne zagrożenie stanowią ostre stany zapalne i infekcyjne (np.: zapalenie płuc, grypa) oraz następstwa upadków i złamań kości. Wśród wielu czynników, które w zasadniczy sposób wpływają na wydolność psychofizyczną, wymienia się czynniki zdrowotne (schorzenia, choroby układowe i narządowe). Do tej grupy czynników należą również schorzenia układu nerwowego takie jak: choroby naczyniowe, zespoły ołepienne czy choroby układu pozapiramidowego.

Cel. Celem pracy była ocena występowania chorób układu nerwowego oraz ich wpływu na stan psychofizyczny osób powyżej 65 roku życia.

Materiał i metody. Badania przeprowadzono w Klinice Geriatrii Szpitala Uniwersyteckiego nr 1. im. dr. A. Jurasza w Bydgoszczy na grupie 127 pacjentów przebywających z powodu zdiagnozowanego procesu chorobowego. Kryterium

doboru osób do badań był wiek, klasyfikujący pacjentów na trzy podgrupy zgodnie z tzw. podokresami starości wg ONZ: 65-74 r.ż. (starość wczesna), 75-89 r.ż. (starość późna), 90 r.ż. i powyżej (długowieczność). W badaniach wykorzystano standardowe skale najczęściej stosowane w praktyce klinicznej/pielęgniarskiej w Polsce i na świecie. Do oceny czynności dnia codziennego zastosowano Activities of Daily Living, do oceny ryzyka upadków Timed Up&Go Test, do określenia nasilenia objawów depresji Geriatric Depression Scale oraz do oceny stanu odżywienia Mini Nutritional Assessment. Dane dotyczące zmiennych socjodemograficznych i klinicznych, zebrano za pomocą ustrukturyzowanego formularza do dokumentowania danych.

Wyniki. Poddając analizie statystycznej wpływ rozpoznania klinicznego na ocenę psychofizyczną osób powyżej 65 roku życia, stwierdzono, że czynnik ten istotnie statystycznie ($p=0.031$) wpływa, tylko na stan funkcjonalny oceniony w skali ADL. W przypadku skali Up&Go ($p=0.214$), MNA ($p=0.324$) i GDS ($p=0.071$) wynik był nieistotny statystycznie.

Wnioski. Choroby układu nerwowego klasyfikowały się na drugim miejscu wśród występującej polipatologii charakterystycznej dla osób w wieku podeszłym. W badanej populacji schorzenie główne z jakim chory był hospitalizowany nie wpływało znacząco na stan psychofizyczny osób powyżej 65 roku życia. (PNN 2015;4(3):96–101)

Słowa kluczowe: choroby neurologiczne, osoby starsze, neurogeriatria

Introduction

The period of aging in an organism entails some involution and ailments that are typical for an old age and they overlap with the previous diseases. That is why multiple morbidity is said to be characteristic for elderly people [1]. In the process of aging the biological processes in an organism slow down. The stability, the internal balance are lowered and the immune system is weakened. This process affects all the systems and organs [1-3]. The most frequent diseases of people aged 60 or over are the diseases of cardiovascular system, musculoskeletal disorders and metabolic diseases. In the case of long-lived people the biggest risk is posed by acute inflammation and infections (e.g. pneumonia, flu) as well as the consequences of falls and broken bones [1]. Among many factors, that significantly affect psychophysical capacity of these people, there should be mentioned health factors (e.g. diseases, some systems and organ disorders) [4,5]. This group also comprises nervous system disorders such as: vascular diseases, dementia and extrapyramidal disorders.

The aim of this work was to assess the incidence rate of the nervous system disorders and their influence on the psychophysical condition of people aged 65 or over.

Material and Methods

We conducted the study in the Clinic of Geriatrics Bydgoszcz, Poland. Participants included 127 patients hospitalized due to disease process. The profile of the research group is presented in Table 1.

The research techniques used for the prospective assessment of patients were observation and measurement technique. The scale used in the research is the standard scale that is most frequently used in nursing and clinic practice both in Poland and worldwide. We used the Activities of Daily Living (ADL) scale [6-8] to assess everyday activities, Timed Up&Go Test (Up&Go) [9,10] was used to assess the risk of falls, Geriatric Depression Scale (GDS) [11] was used to point the risk of worsening of depression symptoms and Mini Nutritional Assessment

(MNA) [12] to assess the nutritional condition of the participants. The data that refers to sociodemographic and clinic variables was collected with the use of structured form used for data collection.

Table 1. Characteristics of the observed group

Variables	n	%	Min	Max	\bar{x}	SD
Gender						
Female	88	69.3	-	-	-	-
Male	39	30.7	-	-	-	-
Age (average age 78±6) (years)						
65 - 74	40	31.5	-	-	-	-
75 - 89	81	63.8	-	-	-	-
≥ 90	6	4.7	-	-	-	-
Place of residence						
City	108	85.0	-	-	-	-
Village	19	15.0	-	-	-	-
Family situation						
Single	47	37.0	-	-	-	-
With the carer	80	63.0	-	-	-	-
Hospitalization time (number of days)						
	127	100	4	21	9.4	3.9

Note: Min = minimum, Max = maximum, \bar{x} - average, SD = standard deviation

The criterion used for the selection of research participants was their age. They were divided into three subgroups in accordance with the subperiods distinguished by UNO (United Nations Organization): 65-74 (early old age), 75-89 (advanced old age), 90 and more (longevity) [3].

Ethical Considerations

The Bioethics Committee of Nicolaus Copernicus University Collegium Medicum in Bydgoszcz, Poland, approved this study.

Statistical Analysis

We performed statistical analyses using Microsoft Excel and STATISTICA, version 9.1. (license of Collegium

Medicum of Nicolaus Copernicus University). Statistical hypotheses were verified at the level of relevance $p < 0.05$.

Results

The conducted study indicates that the nervous system disorders (as diseases mostly connected with hospitalization) appear in 37 cases in studied group (which gives 29% of all participants). These diseases were placed second to cardiovascular diseases, which were identified in 45 cases (35% of the research group). Moreover, it has been proved that most of the patients had more than one disease – approximately 4 diseases. More than half of the research group (76 participants – 59.8%) declared taking more than 5 medicines per day, which was characterized as multi-medication (the average number in the research group was 5 ± 2 medicines) (Table 2).

Table 2. The characteristic of the diseases

Variables	n	%	Min	Max	\bar{x}	SD
Main disease						
Cardiovascular diseases	45	35.4	-	-	-	-
Nervous system diseases	37	29.1	-	-	-	-
Respiratory system diseases	14	11.0	-	-	-	-
Gastrointestinal diseases	11	8.6	-	-	-	-
Metabolic diseases	8	6.2	-	-	-	-
Tumors	3	2.3	-	-	-	-
Motor system disorders	2	1.6	-	-	-	-
Urogenital system diseases	4	3.1	-	-	-	-
Other	3	2.3	-	-	-	-
The number of concomitant diseases						
	127	100	0	8	3.3	1.8
The number of taken medicines (the average number of medicines per day, a standard deviation 5 ± 2)						
Max 4 medicines	51	40.2	-	-	-	-
5–9 medicines (multimedication)	76	59.8	-	-	-	-

Note: Min = minimum, Max = maximum, \bar{x} - average, SD = standard deviation

Table 4.2. Clinic diagnosis and psychophysical condition

	Clinic diagnosis																		H	p
	[1]		[2]		[3]		[4]		[5]		[6]*		[7]*		[8]*		[9]*			
	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me	\bar{x}	Me		
ADL	5.08	6.00	4.81	6.00	4.57	5.50	5.27	6.00	4.87	5.50	5.66	6.00	2.00	2.00	4.25	4.50	5.00	5.00	19.57	0.012
Up&Go	15.75	16.00	16.39	15.50	16.63	16.00	11.80	11.50	16.87	14.50	14.41	13.00	30.00	30.00	16.50	16.50	15.33	16.00	9.39	0.309
MNA	23.52	24.00	21.68	22.50	21.75	22.50	21.49	22.00	22.68	24.50	20.83	20.50	19.75	19.75	19.25	19.00	24.33	25.00	12.84	0.117
GDS	9.55	8.00	10.29	10.00	11.35	9.00	8.72	10.00	12.87	12.00	9.33	12.00	16.00	16.00	7.96	9.50	10.00	9.00	8.14	0.419

Note: *was not considered in the analysis – n-value is too low, [1] Cardiovascular diseases; [2] Nervous system diseases; [3] Respiratory system diseases; [4] Gastrointestinal diseases; [5] Metabolic diseases; [6] Tumors, [7] Motor system disorders, [8] Urogenital system diseases, [9] Other

In the assessment of physical function done with the use of ADL scale the participants gained the result 4.89 ± 1.53 , which means that in most cases the participants were functionally efficient. The risk of falls was measured with the use of Up&Go scale. The participants gained the average result 16.10 ± 7.51 seconds, which means that they are at high risk for falls. The nutritional condition of the participants was assessed with the MNA scale and the result was 22.41 ± 3.84 points. It means that those participants are at risk of malnutrition. Taking into consideration the assessment of patients' mood, the participants were given 10.244 ± 5.465 points, which means that most of them were not depressed or showed minor depression symptoms (Table 3).

Table 3. The psychophysical assessment of the research group

Variables	n	%	Min	Max	\bar{x}	SD
ADL	127	100	1.000	6.000	4.889	1.533
Up&Go	110*	100	8.000	62.000	16.10	7.51
MNA	127	100	12.500	29.000	22.413	3.848
GDS	127	100	1.000	23.000	10.244	5.465

Note: Min = minimum, Max = maximum, \bar{x} - average, SD = standard deviation

*in the group of 127 people 110 were tested (low independence, refusal)

The statistical analysis of the influence of the clinical diagnosis on psychophysical assessment of people aged over 65 (Table 4.1) showed that this factor is statistically significant ($p < 0.05$) only with reference to functional condition assessed with the use of ADL scale. There were no statistically important differences observed between two mean values of particular scales depending on the clinical diagnosis (the main disease) beyond ADL scale (Kruskal-Wallis $H = 19.57$; $p = 0.012$) (Table 4.2).

Table 4.1. Clinic diagnosis and psychophysical condition

	ADL	Up&Go	MNA	GDS
Clinic diagnosis	0.031*	0.214	0.324	0.071

Note: χ^2 test, * $p < 0.05$

Discussion

Doing the clinical characteristics of the research group, we can conclude that in most cases the participants suffered from more than one disease. The average number of diseases in the research group was 4. The most frequent disorders were cardiovascular diseases – 45 participants (35%). It correlates with the data collected by Central Statistical Office which shows that the most popular diseases that elderly people suffer from are cardiovascular diseases [13]. The research conducted by Strugała and Wieczorowska-Tobis [14], on the group of 103 patients hospitalized in geriatric ward, the average number of diseases was 3 ± 1 . Skalska et al. [15] conducted a study on the group of 81 patients of the Internal Medicine and Geriatric Clinic, CMUJ Jagiellonian University Medical College and concluded that the most common diseases are: coronary heart disease, pneumonia and an osteoarticular disease. Similar results were gained by Kaczor et al. [16] who conducted a research on a group of 80 patients aged over 90. Such a research was also conducted by Fidecki et al. who studied 130 elderly patients with cardiovascular disorders [17]. In the study carried out by Pitek [18] there were approximately four diseases per one patient at the age over 60, and the most common diseases were cardiovascular disorders (49 participants). According to Bońkowski and Klich-Rączka [19] the elderly people in health care center mostly suffer from: dementia (38%), post-stroke conditions (34%) and heart diseases - insufficiency of the heart muscle (15%).

Our own studies showed that in most cases the psychophysical condition of a patient assessed with the use of ADL scale was satisfactory. It means that these are people considered as physically capable in ADL scale. Such a good (satisfactory) condition is also described by the authors of Polish research papers. The published results of the project *PolSenior*, by Wizner et al. [20] also indicate the satisfactory results in ADL scale – 90%. The studies by Szczerbińska [21], which were conducted on randomly chosen 427 residents of Cracow, show the increased functional efficiency (53% of the participants) in the range of ADL scale in environmental studies. It is comparable in juxtaposition with our own results. The studies of Płaszewska-Żywko et al. [22] conducted on 102 inhabitants from the Social Assistance Care Home, showed that most of the participants (89%) were physically efficient in the assessment done with ADL scale. Other results are presented by Pruszyński et al. [23] in the research conducted on 122 patients of a nursing home in Warsaw. The authors of the publication conclude that only 3.3% of the participants show functional efficiency in ADL scale, but this group does not include any functionally efficient people in the range of IADL (Instrumental Activities of Daily Living) scale. The profile of the institution appears to be the justification for the results. In a nursing home care all the activities are focused on long-term care, which often requires intensive actions concerning an ill and disabled patient [24]. This

institution is a place, where most of the patients cannot function on their own or exist independently in their own environment.

It is also worth to present some foreign studies concerning the issues of functional efficiency in the range of ADL and IADL scale. Italian studies conducted by Balzi et al. [25] showed that disability in the range of ADL scale was 5.5% (49 participants) but in the case of IADL 22.2% (199 participants). The research concerned elderly people aged 65 or over ($n = 848$, the age range 65 - 102) who were the residents of Tuscany (Greve and Bagno a Ripoli). The authors of the study showed that there is a progressive disability in the period of 3 years of observation. The condition of participants considered as inefficient both in the range of ADL (max 8.5%) and IADL scale has worsened. It was also observed that there were some new cases of disability concerning people who were functionally efficient at the beginning of the research. Similar conclusions were drawn by Seidel et al. [26] who assessed the functional efficiency in the range of IADL. There were 6841 participants aged 65 or over. They also concluded that the disability of patients is progressive – it reached the level of 13% (875 participants) after 2 years of observation. Lower mobility was the most important factor connected with the disability. On the other hand, there were Mexican studies conducted by Arias-Merino et al. [27] on 2553 participants at the age of 60 years and over who were the residents of Jalisco state. They showed the disability in the range of ADL scale which reached the level of 9.6% (242 participants) and 31.5% (805 participants) in IADL scale.

Aging is a normal, progressive and irreversible physiological process which is a part of every human development. One of the results of this process is the lower functional reserve of particular organs and systems. An additional burden shows their insufficiency and reduces mobility and the possibility of effective functioning [28].

As shown in the studies by different authors [25,29-33] the functional limits and disability development are mostly affected by cardiovascular diseases, the disorders of osteoarticular system, diabetes, depression and neurodegenerative diseases. Our own studies show that the most frequent were: cardiovascular diseases (as the main disease) – 45 participants (35% of the research group), musculo-skeletal disorders that concerned only 2 patients (1.6% of the research group). Despite the significant incidence rate of cardiovascular diseases, the statistical analysis showed only the connection between the functional efficiency in the range of ADL. There was no recognition of significant influence of the clinical diagnosis on the emotional condition (GDS), the risk of falls (Up&Go) or nutritional condition (MNA).

The Italian studies conducted by Corti et al. [34] showed that arthritis and cardiovascular diseases appeared to contribute to the development of disability in the case of elderly people. Those observations are confirmed with

the studies of other authors: Wang et al. [30], Rubio Aranda et al. [32] and Dunlop et al. [35]. They indicated that cardiovascular diseases and osteoarthritis were the risk factors for functional inefficiency in ADL and IADL scale.

The studies conducted by Gębska-Kuczerowska et al. [5] show that musculoskeletal diseases and cardiovascular diseases reduce physical activity and at the same time lower the functional efficiency. Additionally, the author claims that with age the increasing number of patients find difficulty in movement.

Similar results were gained by Wojszel i Bień [36], whose studies show that functional activity, in its broad sense, highly correlates with locomotive function. The authors conclude that mobility disorders reduce the living space of elderly people making them dependent from others, which lowers their quality of life.

Conclusions

The nervous system disorders were classified for the second place in the context of polipathology which is characteristic for elderly people.

In the research group the main disease, due to which the patient is hospitalized, did not significantly influence the psychophysical condition of people over the age of 65.

Implications for Nursing Practice

The polipathology and biological variety of the course of different illnesses in the case of elderly people require extensive geriatric care. What plays an important role in the practice of a nurse who takes care of elderly patients is the understanding of the aging process and the awareness of factors that may impair their psychophysical condition. That is the reason why there is a need for a development of specialist – holistic care of elderly people, especially in their home environment. Only the collaborative work of people who are properly prepared to provide such help can satisfy the needs of patients (physical, mental, spiritual and social).

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