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Occurrence of Cognitive Impairment and Depressive Symptoms Among the Elderly in a Nursing Home Facility

Występowanie zaburzeń poznawczych i objawów depresyjnych u pacjentów starszych przebywających w Zakładzie Opiekuńczo-Lecznicznym

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article; G – other

Abstract

Objectives. The aim of the study was to assess the occurrence of cognitive impairment and depressive symptoms in elderly patients rehabilitated in a Nursing Home Facility (NHF) in Poland.

Material and Methods. The study involved a group of 254 patients out of 410 subsequently admitted to NHF in years 2007–2010. The group included 205 (80.7%) women, the mean age was 77.7 (\pm 7.8) years. 52.7% of patients had had a stroke, 29.9% – orthopedic injuries, and 17.3% were suffering from chronic diseases of old age. The patients' mental status was assessed in the first week of their stay by the Mini Mental State Examination (MMSE) and the Geriatric Depression Scale (GDS-15).

Results. Cognitive impairment (MMSE < 24) was found in 71.6% of the patients, mild cognitive impairment (MMSE = 26–24) in 16.5%. The mean MMSE was 18.96 (\pm 6.36). Only 11.8% of the seniors achieved a normal score. The highest percentage of people with dementia was reported among stroke patients (79.1%, 106/134). The mean GDS was 7.30 (\pm 3.37). Over 65% of patients had depressive symptoms at admission (GDS>5). Low mood was detected in nearly 70% of patients hospitalised for orthopedic injuries and after a stroke. The correlation analysis showed a significant relationship between MMSE scores and the age among patients after stroke ($p < 0.03$).

Conclusions. The results indicate that it is justified and necessary to do screening tests in order to detect cognitive impairment and depressive symptoms at NHFs. Introducing such a protocol enables us to provide patients with essential medical and psychological help, which in turn influences the effectiveness of the physiotherapy process (Adv Clin Exp Med 2013, 22, 1, 111–117).

Key words: cognitive impairment, depression, elderly patients.

Streszczenie

Cel pracy. Ocena występowania zaburzeń poznawczych i objawów depresyjnych u pacjentów starszych rehabilitowanych w Zakładzie Opiekuńczo-Lecznicznym (ZOL).

Materiał i metody. Spośród 410 pacjentów kolejno przyjmowanych do ZOL w latach 2007–2010 badania przeprowadzono u 254 osób (średnia wieku 77,7 \pm 7,8; 205 kobiet, 80,7%). W badanej grupie było 52,7% pacjentów po udarze mózgu, 29,9% z urazami ortopedycznymi, a 17,3% z chorobami przewlekłymi wieku podeszłego. Stan psychiczny pensjonariuszy oceniano w pierwszym tygodniu pobytu pacjenta w placówce z użyciem: Krótkiej Skali Oceny Stanu Psychicznego (MMSE) i Geriatrycznej Skali Depresji (GDS-15).

Wyniki. Zaburzenia funkcji poznawczych (MMSE < 24) stwierdzono u 71,6% badanych, łagodne zaburzenia poznawcze bez cech otępienia (MMSE = 26–24) u 16,5% pacjentów. Średni wynik MMSE wyniósł 18,96 (\pm 6,36). Wynik prawidłowy uzyskało tylko 11,8% seniorów. Największy odsetek osób z cechami otępienia odnotowano wśród pacjentów po udarze mózgu (79,1%, 106/134). Średni wynik GDS w badanej grupie wyniósł 7,30 (\pm 3,37).

Objawy depresyjne przy przyjęciu na oddział (GDS>5) stwierdzono u 65,2% pacjentów. Obniżony nastrój wykryto u blisko 70% pacjentów hospitalizowanych z powodu urazów ortopedycznych oraz u pacjentów po udarze mózgu. Analiza korelacji wykazała zależność między MMSE a wiekiem w grupie pacjentów po udarze mózgu ($p < 0.03$).

Wnioski. Uzyskane rezultaty wskazują na konieczność wykonywania testów przesiewowych pod kątem zaburzeń funkcji poznawczych i objawów depresyjnych w ośrodkach opieki długoterminowej. Wprowadzenie takiej procedury umożliwi udzielenie niezbędnej pomocy medycznej i psychologicznej, co przekłada się na skuteczność prowadzonej fizjoterapii (*Adv Clin Exp Med* 2013, 22, 1, 111–117).

Słowa kluczowe: zaburzenia poznawcze, depresja, osoby starsze.

The growing percentage of elderly people, and consequently aging population in Poland and the world, increases the number of elderly people with serious health problems, functional disability and multiple diseases which require expert institutional care. In addition to many somatic symptoms and chronic diseases of the old age, mental disorders are common problems of this day and age. These include cognitive impairment (CI), syndromes of dementia and depressive symptoms [1]. The prevalence of dementia in the population of over 65 years of age is approximately 10% [2]. According to Polish studies, dementia occurs in 5.7% or even 55.7% of patients primary health care [3]. These figures are even higher among residents of nursing homes and reach 60–80% [4–7]. The prevalence of depressive disorders among primary health care patients in Poland is also high and amounts to 41% [8]. Among hospital patients and residents of nursing homes, it reaches 15–65%, out of which 2/3 do not receive medical help [9]. It is worth noting that due to the extending average life expectancy, these figures will increase.

The presence of dementia or depression, and often their co-occurrence, is a problem usually under-diagnosed and therefore not treated [4, 10], which significantly complicates the process of care and physiotherapy [11, 12] and prolongs the patient's stay in an institution [13]. In addition, psychiatric problems of patients have a negative impact on their relationships with the medical staff. It may contribute to the development of burnout and chronic fatigue syndrome [14, 15]. Long-term care facilities are still not fully prepared and suited to care for such patients [10].

Due to the aforementioned facts, it was considered legitimate to investigate the occurrence of cognitive impairment and depressive symptoms in elderly patients rehabilitated in a Nursing Home Facility (NHF), and thus to answer the question of the intellectual and emotional state of elderly people admitted to a NHF for rehabilitation.

Material and Methods

The study was conducted in a Nursing Home Facility with a rehabilitation profile in Wrocław

where 410 patients were admitted consecutively in the years 2007–2010. Patients with aphasia and severe loss of vision or hearing impairment that hinder an assessment of cognitive functions were excluded from participation in the study. Other exclusion criteria were: age below 60 years, alcoholism, the presence of consciousness disorders at the time of examination or medical records of mental retardation and other serious mental disorders (e.g. schizophrenia), as well as a patient's refusal at every stage of the study. Eventually, the study involved 254 patients, including 205 women (80.7%) and 49 men (19.3%) (Figure 1). The average age in the study group was 77.7 ± 7.8 years. The main cause of hospitalization and physiotherapy were: stroke (52.7%), orthopedic injuries resulting from a fall (29.9%), and chronic diseases of old age (17.3%), such as arthrosis, rheumatoid arthritis or a state after lower limb amputation resulting from diabetes or atherosclerotic occlusive disease. In the group of patients after stroke, 104 had ischemic stroke (40.2%) and 32 patients had hemorrhagic stroke (12.5%). The most common diseases that coexisted among patients after stroke (also in the other groups) were: hypertension, diabetes, atherosclerosis and ischemic heart disease.

The patients' mental condition was assessed during the first week of their stay in a NHF with the use of Mini Mental State Examination (MMSE) and Geriatric Depression Scale (GDS-15). These are easy and very time-saving screening methods recommended by both the Interdisciplinary Group of Experts in Recognition and Treatment of Dementia (IGERO) and by other researchers working with patients over 65 years of age [1, 16].

MMSE by Folstein et al. is a specific method developed to examine individuals with suspected dementia. It examines orientation, memory, naming, reading comprehension, writing, and constructional praxia (copying of a complex graphic pattern). Diagnostic sensitivity of this method is 87–90% and specificity 80–82% [17]. In the test, the patient can score a maximum of 30 points. The norm is a score of 30–27 points, a score between: 26–24 points suggests cognitive impairment without dementia, 23–19 points suggests mild demen-

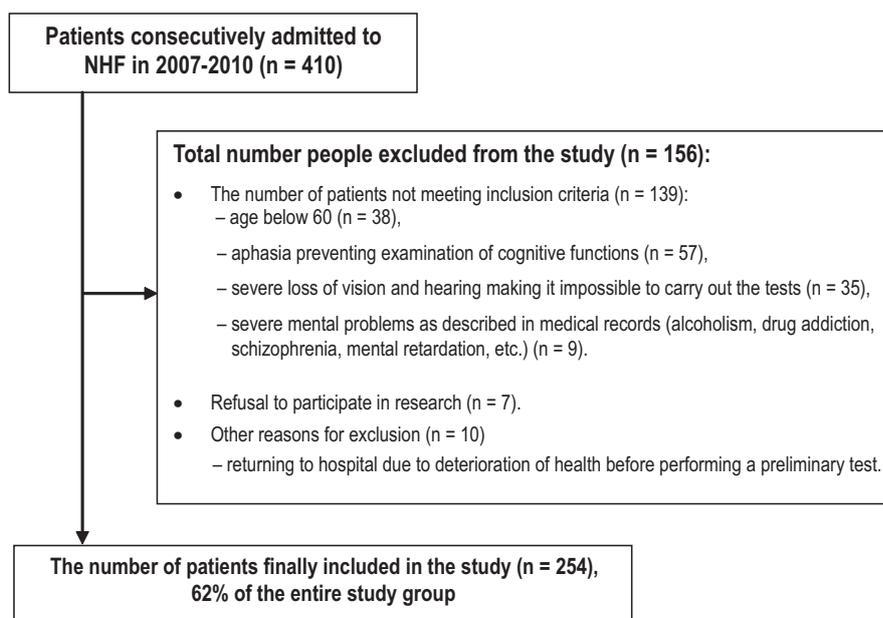


Fig. 1. The recruitment process towards the study group

Ryc. 1. Proces rekrutacji z docelową grupą badań

tia, 18–11 points suggests moderate dementia, 10–0 points indicates severe dementia.

Test results depend on the patient's age, education, and also their profession, social status, sensory deficits as well as their pre-morbid intelligence [3]. Due to the difficulty in obtaining information regarding the number of years of schooling from some patients, and considerably few patients with secondary or higher education, a uniform set of criteria was adopted in the study and arbitrarily set cut-off points were applied to differentiate patients with dementia and without signs of dementia.

The GDS was established in 1983 and is the most commonly used screening scale of well-being and quality of life self-assessment of the elderly. The short version contains 15 questions where patient answers "yes" or "no". The assessment concerns a period of two weeks immediately preceding the test. The GDS measures subjective satisfaction with quality of life, mood, sense of happiness or lack thereof. A score between 0–5 points indicates no depression, 6 points and above – a depression of increasing severity [18]. As emphasised by many authors, the GDS maintains high diagnostic value when the MMSE \geq 15. Under this assumption, the sensitivity of the scale is 84% and the specificity is 91% [19]. Therefore, the examination was performed only in those patients who achieved a score above 15 points in the MMSE. Please note that the results of these screening tests only reflect the general state of the patients' cognitive functions and mood, and they are not a medical diagnosis.

The obtained results were presented as means \pm standard deviations, numbers and percentages. The Shapiro-Wilk test was used to check for normal distribution of the data. The Student's

t-Test and the Mann-Whitney test were used to assess the significance of differences between two groups and the Kruskal-Wallis test for three groups. Spearman's rank correlation coefficient was determined to examine the relationship between variables. P-value \leq 0.05 was adopted as a boundary for significance. Statistica Version 7.0 of Statsoft Poland was used to carry out the statistical analysis.

Results

Cognitive impairment disorders (MMSE < 24) were found in 71.6% of the patients studied (182/254). Only 11.8% had normal MMSE score (30–27). The mean MMSE score was 18.96 (\pm 6.37). On admission to NHF, depressive symptoms (GDS > 5) were found in 65.2% of patients (120/184). The mean GDS score in the study group was 7.30 (\pm 3.37). More than 44% (81/184) of the study group are patients who had developed both: impaired cognitive functions and depressive symptoms (MMSE < 24, GDS > 5). The remaining results are presented in Table 1.

Upon the division of the study sample according to gender, the results indicate that in both: women group (205) and men group (49) the largest group were patients with dementia (70.7% vs. 75.5%). The mean MMSE score did not differ significantly in both groups and amounted to 18.84 \pm 6.54 in women and 19.47 \pm 5.54 in men ($p = 0.5340$). The number of examined men and women who had normal scores did not exceed 15% (13.2% vs. 6.1%). The results regarding the occurrence of depressive disorders were found to be similar. The

Table 1. Percentage distribution of MMSE and GDS results in the study group**Tabela 1.** Wyniki MMSE i GDS w grupie badanej

MMSE			GDS		
Results	n	%	Results	n	%
normal 30–27 points	30	11.8	no depression 0–5 points	64	34.8
mild cognitive impairment 26–24 points	42	16.6			
mild dementia 23–19 pkt	75	29.5	mild depression 6–10 points	83	45.1
moderate dementia 18–11 points	75	29.5			
severe dementia 0–10 points	32	12.6	severe depression 11–15 points	37	20.1
Total (Suma)	254	100.0	total	184	100.0

mean GDS scores did not differ statistically (7.36 ± 3.35 vs. 7.08 ± 3.50 , $p = 0.6529$), and the number of patients with depressive symptoms was over 60% in both groups (64.4% women, 60.5% men). The two groups differed significantly in age ($p = 0.0122$). Women were older (78.35 vs. 75.26).

Dividing the group under study according to disease entity being the leading cause of hospitalization, the largest percentage of patients with

dementia symptoms was reported among stroke patients (79.1%). A similar percentage of patients with dementia was found among those with chronic diseases and the lowest – in patients hospitalized due to fractures. Low mood was detected in nearly 70% of patients hospitalized for orthopedic injuries and in stroke patients (Table 2). These groups did not differ significantly in terms of mean MMSE and GDS scores. Nevertheless, it

Table 2. Percentage distribution of MMSE and GDS results by type of disease**Tabela 2.** Rozkład procentowy wyników MMSE i GDS z podziałem na rodzaj schorzenia

Results (Wyniki)	Type of disease (Rodzaj choroby)					
	stroke		orthopedic injuries		chronic illness	
GDS	n	%	n	%	n	%
no depression 0–5 points	32	33.7	19	31.7	13	44.8
depression 6–15 points	63	66.3	41	68.3	16	55.2
Total (Suma)	95	100.0	60	100.0	29	100.0
MMSE	n	%	n	%	n	%
normal 27–30 points	9	6.7	13	17.1	8	18.2
mild cognitive impairment 26–24 points	19	14.2	18	23.7	5	11.4
dementia 23–0 points	106	79.1	45	59.2	31	70.4
Total (Suma)	134	100.0	76	100.0	44	100.0

Table 3. MMSE and GDS results by type of disease**Tabela 3.** Wyniki MMSE i GDS z podziałem na rodzaj schorzenia

	Stroke (Udar)			Orthopedic injuries (Urazy ortopedyczne)			Chronic illness (Choroba przewlekła)			p-value
	n	mean	std	n	mean	std	n	mean	std	
Age (Wiek)	134	75.47	8.24	76	81.29	5.69	44	78.53	7.21	< 0.00001
MMSE	134	18.23	6.13	76	20.13	6.59	44	19.55	6.34	0.0579
GDS	95	7.35	3.25	60	7.20	3.40	29	7.34	3.80	0.9227

is worth noting that the best scores concerning cognitive functions were achieved by patients with orthopedic disorders, and the worst were patients after a stroke. A similar situation was with the occurrence of depressive symptoms. These groups differed significantly only in age, the oldest patients were ones with orthopedic problems, and the youngest were stroke patients. The results are shown in Table 3.

In the whole study sample ($n = 254$), correlation analysis revealed no relationship between age and GDS score ($p = 0.1847$) and a low significant relationship between age and MMSE score ($p = 0.050$). Simultaneously, the GDS and MMSE were correlated ($p = 0.0013$). This means that a serious cognitive impairment is usually accompanied by depressed mood. In the group of stroke patients, a significant correlation between MMSE and age was also confirmed, and this relationship was stronger than for the entire study group ($p = 0.0231$).

Discussion

Among elderly patients residing in long-term care facilities (nursing homes, medical care facilities), the percentage of people with CI is greater than in the general population and in the United States, for example, it amounts to 26.4% [20]. The results obtained in this project strongly deviate from this data. The percentage of people with CI is above 70%. This result is similar to the results obtained by Muela et al. (2009), where the percentage of people with some degree of CI was approximately 76% [6] and similar to the results Mongila et al. (2009) and Majica et al. (2009), respectively 61.7% and above 60% [4, 15]. An even higher percentage of people with CI (81.3% and 82%) were diagnosed among residents of Polish and Norwegian nursing homes in the study by Tomaszewski et al. (2010) and Bergh et al. (2012) [5, 7]. Unfortunately, the diversity of methods used by researchers causes a great difficulty in comparing the results which

Gustaw and Bylina (2007) point out in their paper [21]. The same applies to the occurrence of depressive symptoms. The result of 65.2% obtained in this study is high and indicates the existence of serious emotional problems in patients residing at the NHF's. Similar findings (57.7%) were reported by Chahine et al. (2007) [22].

According to the findings by some authors, mental disorders in the form of cognitive and emotional impairments more often affect women than men [5]. In this study there were no significant differences in the prevalence of cognitive and emotional impairments according to gender. Similarly, in study Mongila et al. (2009) [4].

The worst results both in cognitive and emotional terms (although the youngest at age) were found in patients after a stroke. The obtained results, 79.1% and 66.3% respectively are similar to the results of Saxena et al. (54% and 60%) and own earlier studies (85% and 78%) [23, 24]. For this group of patients a highly probable assumption can be made that cognitive impairments have already occurred before the stroke incident (especially in patients with ischemic stroke, 40.2%), since vascular factors ultimately leading to stroke are also a significant component of the process of dementia [25]. The sudden stroke incident which causing damage to a specific area of the brain, disability and total dependence on other people causes depressed mood and post-stroke depression [24, 26]. The best results of the cognitive function obtained in patients after orthopedic injuries. Meanwhile studies had shown that this group of elderly people undergoing rehabilitation regains lost capacity at the fastest rate [27]. It seems therefore, that CI's are a significant factor impeding the process of physiotherapy.

The studies here have confirmed a mutual relationship between age and the state of cognitive function in the whole study group. This confirms findings of other authors, stating that older age is a factor determining the existence of CI [4, 20]. The thesis that symptoms of depression are more common in older people has not, however, been

confirmed, although a belief among clinicians about a particularly high incidence of depression among the elderly is widespread. The authors should mention here the diagnostic difficulties which result from the treatment of cognitive impairment and low mood as a consequence of the aging process [1]. Over and above, many people despite health and social problems, regardless of advancing age, live actively and get pleasure from it. The results obtained are in line with views presented by Wichowicz (2008), who claims that age is the most ambiguous prognostic factor of depression [26]. The performed studies show that the worse the subjects' intellectual state, the greater the severity of depressive symptoms. It has probably something to do with the frequent coexistence of depression and the CI (in these studies 44%). Similar results reported by Chahine et al. (2007). They presented that 41% of patients with dementia had some degree of depression [22]. It is known that there may be multiple relationships between these two types of disorders. Depression may develop because of difficulties in everyday functioning (caused by CI). At the same time cognitive impairments may be part of the psychopathology of depression. Some authors mention depression as a hypothetical predictive factor of dementia or its early symptom [1].

In summary, the obtained results do show the existence of a serious problem (often not diagnosed) among patients residing in long-term care

facilities. The high prevalence of CI and depressive disorders detected in screening tests requires a complete clinical diagnosis, in accordance with the ICD-10 criteria as well as additional specialised tests. Unfortunately, financial constraints often make extended research impossible to conduct and cause the prevalence of psychiatric disorders in residents of long-term care facilities underestimated and definitely understated. Only in case of 15% of patients a medical record (e.g. hospital discharge card) suggests the presence of psychiatric problems [13]. In the present study group this record was only in 13.4% (34/254) of patients (of which 8 patients had record of depression). Consequently, in long-term care facilities for the elderly, it is necessary to perform screening tests to detect disorders of cognitive functions and depressive symptoms. Such a procedure helps to identify patients requiring special care and other (than the standard adopted) models of physiotherapy. In addition, working with the mentally ill seniors without adequate knowledge of the personnel is extremely strenuous for both staff and patients, and the effects of physiotherapy are usually much worse than in the case of the mentally healthy peers. Both the long-term care institutions and the staff employed there must be properly prepared (e.g. staff training on the basic issues of psychopathology of mental disorders of the old age) [14, 15] to guarantee an adequate level of care and effective physiotherapy.

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