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ASSESSING THE INCIDENCE OF RISK FACTORS AND COMORBIDITIES ASSOCIATED WITH DEMENTIA OF THE ELDERLY

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ABSTRACT. The objective of this study is to assess the prevalence of the risk factors and comorbidities associated with various types of dementia in elderly people. A group of 162 patients with various types of dementia (Alzheimer's, mixed, senile and unspecified) hospitalized at G. Curteanu Clinic Hospital in Oradea during 2012-2016, was studied.
The following parameters in the clinical observation file were followed: sex, background, age, studies, marital status, diagnosis, associated pathologies and MMSE (Mini Mental State Examination) score.
MMSE was used to evaluate cognitive functionality. The patients were aged between 61 and 92 years, 19.75% being male and 80.25% females. The degree of professional training of the patients was low, 50% of them had only primary education. Of the co-morbidities, cardiovascular diseases have the highest prevalence among dementia subjects included in the study.
KEYWORDS: Alzheimer, dementia, risk factors, comorbidities.

INTRODUCTION

Neurodegenerative diseases: Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, and lobar frontotemporal dementia are among the most acute problems of aging populations.

Neurons perform essential functions such as nerve signal transmission and network integration into the central nervous system and are the main targets of neurodegenerative diseases. Accumulating evidence suggests that neurodegeneration occurs in part because the environment is affected during the disease in a cascade of processes collectively called neuroinflammation (Ransohoff et al., 2016).

Accentuated chronic inflammation and oxidative stress in the brain result in the production of toxic compounds that compromise cell function, alter cell phenotypes, cause DNA damage, and ultimately lead to neuroinflammation and neurodegeneration. Thus, there is evidence to substantiate the implication of cerebrovascular dysfunction in the pathogenesis of AD and other dementias (Deane et al., 2003).

Alzheimer's disease (AD) is the most prevalent type of dementia, which includes about 60% -70% of all cases of dementia (Reitz et al., 2011). It causes serious suffering for patients in the form of progressive behavioral and neurological changes including functional impairment, loss of independence, emotional problems and behavioral disorders (Plassman et al., 2010).

Currently, one in nine people aged 65 and over has AD and are affected by it more than one in three people aged 85 and older. (Thies et al., 2013). People with dementia have a greater burden of comorbid physical illnesses and polymedication than those without dementia, even after calculating differences for age and gender. Such complex needs require a global response from health professionals and specialists in multidisciplinary dementia (Clague et al., 2016).

In this context, we considered it appropriate to carry out a study evaluating the risk factors for cognitive impairment, associated comorbidities, the prevalence of dementia types and the stage of the disease.

MATERIALS AND METHODS

For the study, 162 patients with dementia that were hospitalized in the psychiatric departments of the G. Curteanu Clinic Hospital in Oradea during the period 2012-2016 were recruited.

The following parameters in the clinical observation file were followed: age, gender, patient background, professional training, marital status, comorbidities, cognitive impairment, diagnosis, MMSE score. These parameters were centralized and statistics were performed to better track the distribution of cases

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according to risk factors, comorbidities, cognitive impairment and cognitive function.

Cognitive functionality was evaluated using the MMSE scale. MMSE was performed by the psychologist at the hospital. Patients who achieved a score of less than or equal to 24 during the screening period were included in the study. The incidence of pathologies associated with the cognitive impairment, the type of cognitive disorder present in the studied patients and their placement in a certain stage of the disease according to the MMSE result were monitored.

RESULTS AND DISCUTIONS

The patients were aged between 61 and 92 years, the majority being between 71-85 years, the average age was 75.85 years. In the studied group, out of the 162 cases, 32 (19.75%) were male and 130 (80.25%) females, 85 (52.47%) came from the urban environment and 77 patients (47.53%) from rural areas, respectively (Table 1).

The prevalence of AD is significantly higher in women than in men. Some estimations suggest that nearly two-thirds of people diagnosed with AD are women (Hebert et al., 2013). One reason for a higher prevalence among women might be that they live longer, on average, than men (Seshadri et al., 1997; Plassman et al., 2007).

Animal and cellular models have consistently demonstrated the neuroprotective effects of estrogen, of which we mention (Mielke et al., 2014): improving cerebral blood flow and glucose metabolism (Wang et al., 1999) reducing beta-amyloid aggregation and associated neurotoxicity (Jaffe et al., 1994; Nilsen et al., 2006) increasing the activity of choline-acetyl transferase in the basal brain and the hippocampus (Gibbs et all., 1998; Gibbs et al., 1994).

As regards the degree of education, we found that 50% had only primary education (81 cases), 63 cases (38.89%) had secondary education and 9 (5.56%) of the patients completed high school studies. 4 patients (2.47%) were graduates of higher education, and in 5 patients the level of professional training was not specified (Table no.1).

Although education and socio-economic status are closely related, when studied separately, an independent association with cognitive impairment was found only for education (Karp et al., 2004). Lower education is linked to an increased risk of dementia and AD. This link has been confirmed by many transverse and longitudinal studies (Qiu et al., 2001; Ngandu et al., 2007)

Social isolation plays an important role in the evolution of dementia, in the studied group almost 59.26% were widowed people, the mean age being over 75 years (Table1).

Table 1. Prevalence of risk factors

Characteristics		Patients	
		No.	%
Gender	Male	32	19.75
	Female	130	80.25
Provenience area	Urban	85	52.47
	Rural	77	47.53
Age groups (years)	≤65	3	1.85
	66-70	12	7.40
	71-75	48	29.64
	76-80	39	24.07
	81-85	41	25.30
	86-90	10	6.17
	>90	9	5.57
Studies	Primary education	81	50.00
	Gymnasium studies	63	38.89
	High school	9	5.56
	Higher education	4	2.47
	Not specified	5	3.08
Civil status	Married	58	35.81
	Unmarried	3	1.85
	Divorced	5	3.08
	Widow	96	59.26

In the studied group the most common comorbidities were generalized atherosclerosis 31.49% of cases, ischemic cardiopathy 29.03%, hypertension 17.29% and type II diabetes 12.34% - being present in significant percentages; in smaller percentages we found heart failure 2.93%, Parkinson's disease and cachexia both in a percentage of 2.46% according to Figure 1.

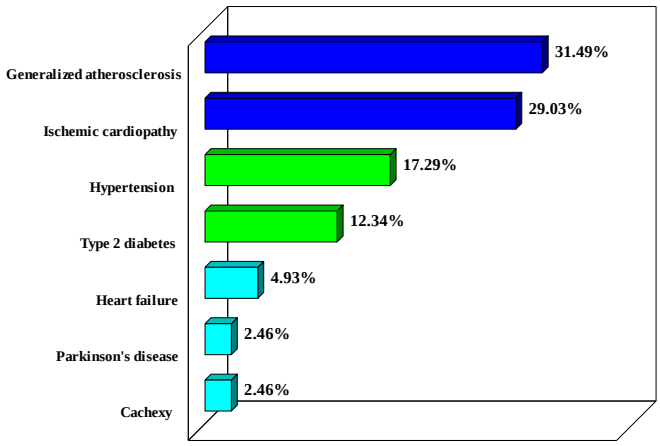

Fig.1. Distribution of cases according to comorbidities

Alzheimer's disease is an important public health issue. Its etiology is still unknown, and it is therefore necessary to study all potential risk factors that can contribute to its development. From the point of view of early diagnosis and the potential use of primary or secondary prevention, genetic factors are the most important (Povovaa et al., 2012).

The results of a meta-analysis of prospective observational studies showed an increase in risk for all types of dementia by 73%, a 56% increase in Alzheimer's dementia and a 127% increase in vascular dementia in patients with diabetes mellitus (Gudala et

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al., 2013). The findings of another meta-analysis have shown that the risk of dementia or mild cognitive impairment is higher among people with diabetes than in the general population. Diabetic patients therefore have a 2-fold higher risk of developing vascular dementia and also have a higher risk of developing AD, any dementia and mild cognitive impairment. It is suggested that diabetic treatments that can reduce the risk of dementia or mild cognitive impairment should be chosen or that subjects with diabetes should receive special strategies to prevent dementia or mild cognitive impairment (Cheng et al., 2012).

Also, cardiovascular disease is associated with an increased incidence of dementia and AD, with the highest risk of dementia in people with peripheral arterial disease, suggesting that extensive peripheral atherosclerosis is a risk factor for AD (Newman el al., 2005; Beeri et al., 2006). Cardiovascular diseases such as stroke, atrial fibrillation, coronary heart disease (CCH) and cardiac failure are very common in the elderly and have been regularly linked to AD. This association could be due to common risk factors between cardiovascular disease and AD (de la Torre et al., 2012; Goldberg et al., 2012). Neuropathological studies have suggested that cerebrovascular injuries, atherosclerosis and neurodegenerative changes often coexist in the brain, producing a clinical manifestation of dementia syndrome (Snowdon et al., 1997; Esiri et al., 1999).

A study concludes that there is abundant and converging evidence that cardiovascular diseases and cardiovascular risk factors play an important role in the etiology of AD. While for some of these factors the mechanisms that bind them to AD are clear, for others the association with AD is more complex and requires further research to be fully revealed.(FAG de Bruijn et al., 2014).

In the study group, 141 patients (87.03%) were diagnosed with Alzheimer's dementia, 11 patients (6.80%) mixed dementia, 4 patients (2.47%) senile dementia and 6 patients (3.70%) with unspecified dementia (Table 2).

Table 2. Distribution of cases based on cognitive disorder

Cognitive disorder	Patients	
	No.	%
Alzheimer's dementia	141	87.03
Mixed dementia	11	6.80
Senile dementia	4	2.47
Unspecified dementia	6	3.70

According to the MMSE score, 26.54% of the patients were diagnosed with mild impairment, 55.56% with moderate impairment and 17.9% with severe impairment (Table 3).

Table 3. Distribution by impairment

Stage	MMSE score	Patients	
		No.	%
Mild impairment	21-24	43	26.54
Moderate impairment	10-20	90	55.56
Severe impairment	<10	29	17.90

According to the data obtained from the study, from the point of view of cognitive impairment, age is a risk factor for all evaluated patients considering that all are over the age of 60.

In terms of social isolation, this risk factor was met in more than half of the study subjects in different percentages depending on the type of cognitive disorder. In subjects with Alzheimer's dementia, 54.60% have as a risk factor the social isolation, in the case of those with mixed dementia the percentage is 99.90% and in the case of those with senile dementia and unspecified dementia the percentage is 100%.

Lack of studies is also very common among subjects included in the study, half of them having only primary education. In 50.35% of patients with Alzheimer's dementia, the lack of studies is a risk factor, 36.36% of those with mixed dementia have been subject to this risk factor, 75.00% of senile dementia have as a risk factor the lack of studies and of those with unspecified dementia 50% have as a risk factor the lack of studies.

Regarding comorbidities, most subjects included in the study have cardiovascular diseases associated with dementia diagnosis (generalized atherosclerosis, ischemic cardiopathy, hypertension, heart failure). In the case of patients with Alzheimer's dementia, 81.56% of them have cardiovascular disease and 9.92% diabetes mellitus; 54.54% of patients with mixed dementia have cardiovascular disease and 27.27% diabetes mellitus; in the case of senile dementia 75% have cardiovascular disease and 25.00% diabetes mellitus, and of those with unspecified dementia 50% have cardiovascular disease and 33.33% diabetes mellitus.

According to MMSE score, patients were enrolled in 3 stages of cognitive impairment: mild, moderate and severe. Among patients with Alzheimer's dementia, more than half are in the 59.57% moderate phase of the disease, 24.11% are in mild and 16.31% in the severe. For patients with mixed dementia in terms of MMSE score the distribution is as follows: 63.36% are in the mild phase of the disease, 27.27% in the moderate phase and 9.09% in the severe phase. All patients with senile dementia fall into the severe phase of the disease. Patients with unspecified dementia are as follows: 50.00% in the moderate phase, 33.33% in mild phase, and in severe phase we have 16.66% (Table 4).

Table 4. Clinical characteristics based on cognitive impairment

Clinical characteristics	Alzheimer's dementia		Mixed dementia		Senile dementia		Unspecified dementia	
	Patients							
	No.	%	No.	%	No.	%	No.	%
Risk factors								
Age	141	100	11	100	4	100	6	100
Social isolation	77	54.60	10	90.90	4	100	6	100
Lack of studies	71	50.35	4	36.36	3	75.00	3	50.00
Comorbidities								
Cardiovascular diseases	115	81.56	6	54.54	3	75.00	3	50.00
Diabetes	14	9.92	3	27.27	1	25.00	2	33.33
MMSE score								
Mild impairment	34	24.11	7	63.63	-	-	2	33.33
Moderate impairment	84	59.57	3	27.27	-	-	3	50.00
Severe impairment	23	16.31	1	9.09	4	100	1	16.67

The mean value of the MMSE score based on cognitive impairment is shown in Figure 2.

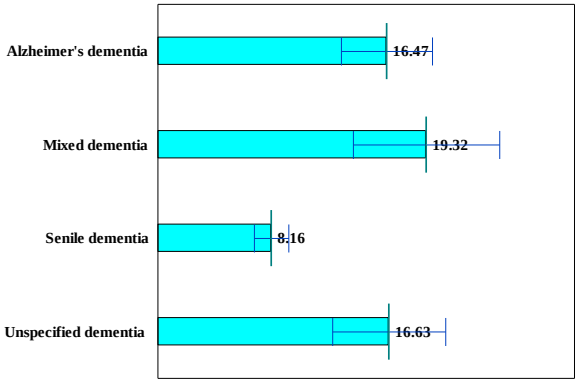

Fig.2. MMSE score based on cognitive impairment

CONCLUSIONS

All patients included in the study presented at least one risk factor, age being a common risk factor for all.

The most common type of dementia among the subjects included in the study was Alzheimer's dementia. As for the stage of the disease, most were in the moderate phase of the disease.

All patients included in the study presented comorbidities. Of the comorbidities, cardiovascular diseases have the highest prevalence among dementia subjects included in the study.

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