

MOTOR, NEUROPSYCHIATRIC DISORDERS AND FUNCTIONALITY STROKE CONSEQUENCES IN GERIATRIC POPULATION – A RETROSPECTIVE STUDY*

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Objectives: Stroke is a disease more frequent as population is confronted with demographic aging. Our aim is to contribute at defining the profile of post-stroke geriatric patients, analyze related cardiovascular risk factors, measure neurocognitive and depressive consequent disorders, as well as the level of secondary (dys)functionality/dependency.

Methods: retrospective study (1/07/2021-30/06/2022), 85 subacute/sub chronic/ chronic sequelae stroke patients hospitalized in our geriatric ward. Variables analyzed: age, sex, environment, ischemic/hemorrhagic stroke, motor deficit, neurocognitive disorder, Daily-Life-Activities-Scale (ADL), Instrumental-Daily-Life-Activities (IADL), weight, modified Rankin Scale (mRS), Reisberg-scale, Mini-Mental-Scale-Examination (MMSE), GDS-Yesavage, Clock-Drawing-Test-Sunderland, carotid-atherosclerosis, hypertension, dyslipidemia, diabetes, smoking.

Results: mean age 78.06[60,91]; 44.7% old patients (75-84 years), 27.1% (65-74) young old, 57.6% females; 69.4% urban environment. Most of these patients- 94.1% had ischemic stroke, leading to 58.8% hemiparetic patients. The motor deficit is characterized by different degrees of disability suggesting that 26.2% manifested 5 points on mRS scale, indicating total functional dependency. Additional to disability and motor deficit, 45.9% presented depression and is correlated to the degree of ADL functionality with statistical significance ($p = 0.002$) and with IADL ($p=0.001$). Also, neurocognitive disorder is present in 67.1% of patients with a mean MMSE of 21.76 points. We observed that the degrees of motor deficit are statistically significantly correlated with the severity of depression ($p=0.016$). The degree of neurocognitive disorder correlates statistically significantly ($p = 0.006$) with the degree of ADL functionality and by default with the degree of IADL ($p=0.081$). The presence of depression correlates with neurocognitive disorder with statistical significance ($p = 0.012$).

Conclusion: The statistically significant results obtained by correlations between functionality, cognitive, mood and motor level, emphasizes the importance of evaluation of these items in the poststroke elderly patients. It also gives a perspective of studies in these patients, a possible starting point for focusing on the benefits of new neurorehabilitation techniques.

Keywords: stroke, elderly, functionality, neurocognitive disorder, depressive disorder.

INTRODUCTION

Stroke, a life-threatening condition, is a disease of demographic aging^{1,2}. Its incidence increases with age, considered to be the second leading cause of death for individuals over 60 years old and generates severe negative consequences on affected people and

society². Is the most important cause of disability worldwide. Recent estimations from World Health Organization (WHO) showed that each year worldwide 15 million people are affected by stroke, with a global incidence of one in six people¹.

About 80% are stroke survivors that experience motor impairments contralateral to the lesioned hemisphere as limb hemiparesis, spasticity, gait disturbance and loss of functionality⁴.

A wide spectrum of neuropsychiatric diseases after stroke is common, emphasizing neurocognitive disorders as well as depressive and anxiety disorders^{2,3}.

In a study that included post stroke survivors with different subtypes of stroke, measured

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cognitive impairment by Mini-Mental State Examination (MMSE) conclusion that 12.2% individuals have dementia at 6 months and 7% at one year post stroke. The risk of developing dementia is greater than in the same age general population, when comparing to healthy people. Recurrent strokes increase the post-stroke neurocognitive disorder, as we can see at 3 years after the first event the prevalence was estimated to be 26.4%, and with an estimated prevalence of 41.3% in patients with recurrent stroke, linking dementia to be an important risk factor to further strokes³. Within conducted trials, additional to neurocognitive disorders, was stated that one in 3 individuals affected by stroke suffers from depression⁵.

Clinicians and researchers have developed concerns for these post stroke complications associated with worsened outcome, functional impairment status, compromised quality of life, increased burden of caregiving and high hospitalizations costs^{1,4,6}.

OBJECTIVES

Stroke is a disease of demographic aging. Our aim is to define the profile of post-stroke geriatric patient, analyze cardiovascular risk factors, measure neurocognitive and depressive disorders as well as the level of functionality/dependency.

METHODS

We conducted a retrospective study (1/07/2021–30/06/2022), 85 subacute/sub chronic/chronic sequelae stroke patients hospitalized in a geriatric ward. Variables analyzed: age, sex, environment, ischemic/hemorrhagic stroke, motor

deficit, neurocognitive disorder, Daily-Life Activities-Scale (ADL), Instrumental-Daily-Life-Activities (IADL), weight, modified Rankin Scale (mRS), Reisberg-scale, Mini-Mental-Scale-Examination (MMSE), GDS-Yesavage, Clock-Drawing-Test-Sunderland, carotid-atherosclerosis, hypertension, dyslipidemia, diabetes, smoking.

RESULTS

The geriatric study population had a mean age 78.06[60,91] (SD 7.858), within 60-91 years old (Table 1). Among the patients the most frequent category is middle-old (44.7%, 75–84 years old), followed by young old (27.1%, 65–74 years old) (Fig. 1). Most of these patients were females, 57.6% and 69.4% came from urban environment.

We noted important cardiovascular disease factors: 96.3% have carotid atheromatosis, 92.9% have hypertension, 88.9% are dyslipidemic, 59.1% are overweight, 38.6% have diabetes mellitus and only 3.5% are active smokers, as shown in Figure 2. Very high risk hypertension, stage 2 and 3, was the most common form of hypertension, 50.6% and 36.7% (Fig. 3).

Ischemic stroke was found among 94.1% patients, leading to 58.8% hemiparetic patients.

The motor deficit is characterized by different grades of disability suggesting that 26.2% manifested 5 points on mRS scale, indicating total functional dependency. Prevalence of functionality on ADL Scale has shown that 59% of patients are independent, followed by 22.2% partial dependency Group (Fig. 4).

Table 1

Descriptive statistics-age, MMSE, CDT – Sunderland, Reisberg, GDS, ADL, IADL

DESCRIPTIVE STATISTICS								
		Age	MMSE	CDT	Reisberg	GDS	ADL	IADL
N	Valid	85	66	38	18	58	81	81
	Missing	0	19	47	67	27	4	4
Mean		78.06	21.76	7.97	4.00	6.95	3.716	3.321
Std. Deviation		7.858	6.440	2.756	1.414	4.024	1.9652	2.7458
Minimum		60	2	1	2	0	0	0
Maximum		91	30	10	6	15	6.0	8.0

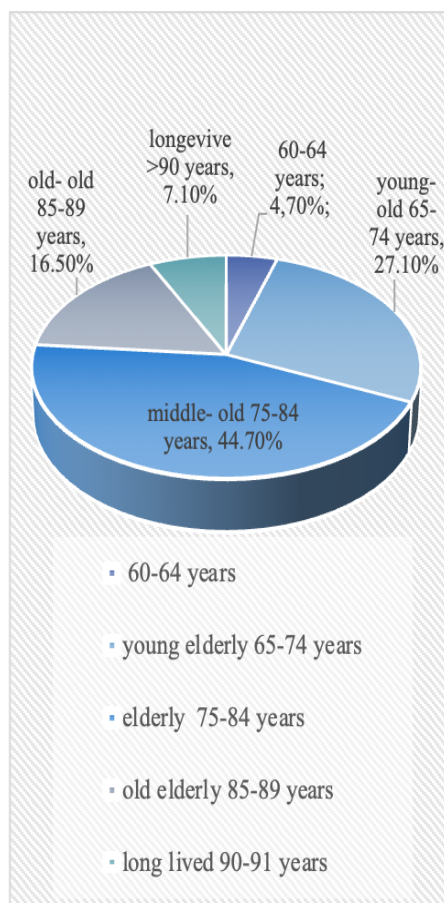


Figure 1. Age distribution.

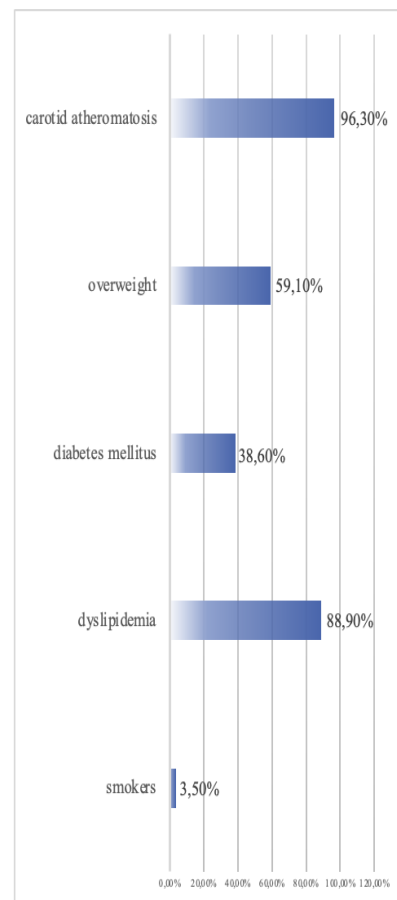


Figure 2. Prevalence of cardiovascular risk factors – carotid atheromatosis, overweight, diabetes mellitus, dyslipidemia, smoking.

A small percent of 18.5% patients has a total dependency. Functionality measured by IADL Scale has shown a high dependency of 48,1%, followed by 28.4% independent patients (Fig. 5).

Additional to disability and motor deficit, 45.9% presented depression, mean 6.95 p [2,30] (SD 4.024) (Table 1).

Also, neurocognitive impairment is present in 67.1% of patients mean MMSE: 21.76p (Table 1). The most frequent form of neurocognitive disorder is the mild form of mixed etiology 33.3%, followed by moderate form mixed etiology 29.8% (Fig. 6).

52% of patients with hemiparesis show depressive affective disorder, which shows that the more severe the deficit is, the more frequent the depressive effect ($p=0.016$).

The presence of depression correlates with the form of the neurocognitive disorder, depression is more frequent among mild neurocognitive disorder ($p=0.012$). The more severe the neurocognitive disorder is, the more functional impairment occurs

reported on the ADL scale ($p = 0.006$). The higher the degree of functional impairment on the ADL and IADL scale, the greater the presence of depression ($p = 0.002$, respective $p=0.001$).

DISCUSSION

Cardiovascular risk factors such as hypertension, carotid atheromatosis and dyslipidemia, among the analyzed patients are the most prevalent ones as shown in other cardiovascular risk studies⁷.

Ischemic and hemorrhagic are the 2 subcategories of stroke. Studies shows that 87% of strokes are ischemic², which correlates to our present study, mentioning ischemic stroke as the most prevalent one.

Stroke, a disease that concerns medical scientists worldwide, is common among old patients^{1,8}, causing a spectrum of motor deficits and neuropsychiatric disorders, such as dementia and depression^{4,6}.

As well-known from other studies and present study, motor deficit among stroke survivors is

frequent⁴. More than half of the analyzed patients manifested hemiparesis leading to variable functional impairment, manifesting different grades of partial or total dependency on ADL and IADL Scale.

Depression, a post stroke condition with negative effects on functional recovery, is mentioned in other studies to impact about 33% of stroke

survivors⁵. Comparing to present data, about 45.9% suffered from depression, emphasizing even a greater depression prevalence.

Neurocognitive disorders are found in almost half of individuals suffering from stroke⁹, indicating 67.1% of stroke survivors suffering from different forms of dementia, vascular or mixed forms.

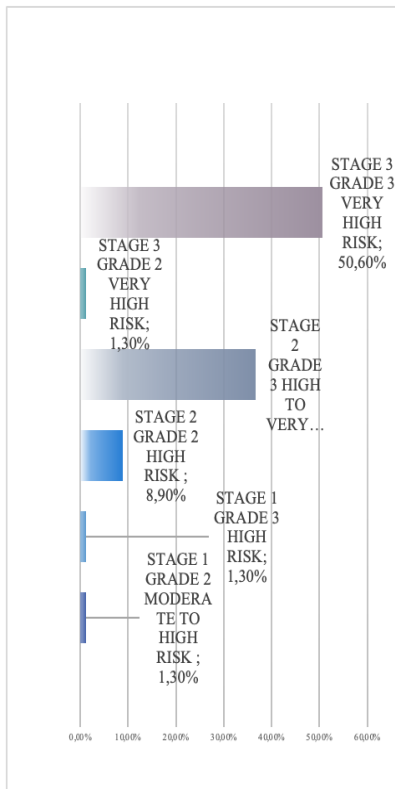


Figure 3. Prevalence of hypertension disease previous to stroke event –distribution among study group.

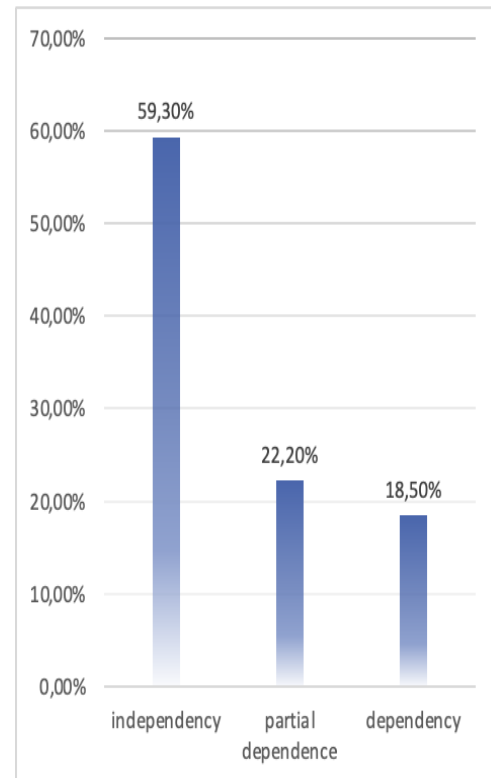


Figure 4. Prevalence of functionality stages measured by ADL Scale.

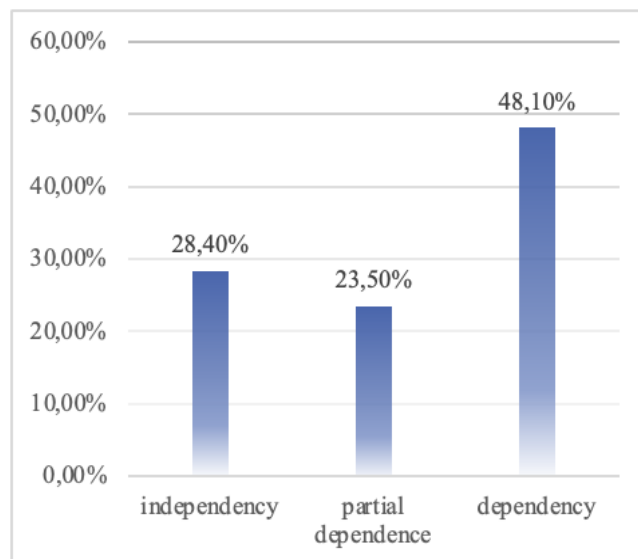


Figure 5. Prevalence of functionality stages measured by IADL Scale.

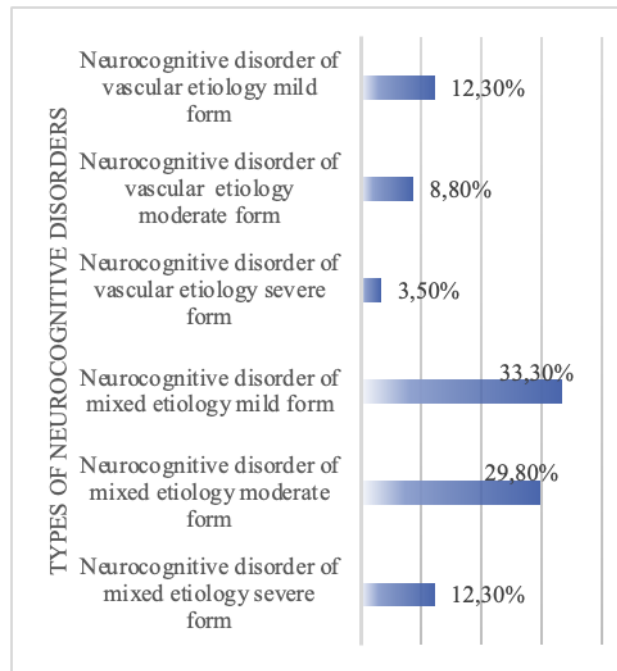


Figure 6. Prevalence and forms of neurocognitive disorder.

The neurocognitive disorder, depression and motor deficit are interconnected by the affected functional status. The prevalence of depression is linked with the severity of motor deficit and the severity of neurocognitive disorder relates to low functioning status, that generate furthermore depression¹⁰.

In the end, a vicious circle is formed, all the mentioned consequences work like a boomerang on geriatric patients, causing disability, high hospitalization costs, burdening the society and the medical system, and ultimately causing elevated morbidity and mortality rates^{1,4,6}.

CONCLUSIONS

In the present study we have measured stroke consequences and some of cardiovascular risk factors among geriatric individuals.

The importance of this study relies on the global current topic regarding ischemic stroke, upon elderly people, in this case, and it is considered a preliminary study.

The statistically significant results obtained by correlations between functionality, cognitive, mood and motor level, emphasizes the importance of evaluation of these items in the poststroke elderly patients.

Optimizing the endeavors meant to define the post stroke elderly patient profile can be a starting point for further studies, for introducing new

neurorehabilitation methods, such as repetitive Transcranial Magnetic Stimulation (rTMS) used for diagnostic, therapeutic and research purposes.

Disclaimer: The authors declare no conflict of interest.

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