Characteristics of cognitive impairment in elderly post-stroke patients at the National Geriatric Hospital

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Summary

Objective: To identify prevalence and characteristics of cognitive impairment in eldery post-stroke patients at the National Geriatrics Hospital. *Subject and method:* A cross-sectional descriptive study on 267 post-stroke patients aged ≥ 60 years old treated at the National Geriatrics Hospital. Patients were interviewed according to uniform questionnaire, cognitive function was assessed by using the Mini-Mental State Examination (MMSE): Total MMSE point < 24: Cognitive impairment. *Result:* The mean age of the patients was 70.5 ± 8.7 years, male patients accounted for 60.3%. The prevalence of cognitive impairment was 66.3%. The rate of severe, moderate and mild cognitive impairment were 32.2%; 18.4% and 15.7%, respectively. The registration, the language and the copying ability of hemorrhagic stroke patients were significantly lower than those in the group of ischemic stroke (p<0.05). *Conclusion:* This study confirms the high prevalence of cognitive impairment after stroke (66.3%) in which severe cognitive impairment (32.2%) was in majority. Cognitive impairment screening and early diagnosis will help to take remedial measures.

Keywords: Cognition, post-stroke, older patient.

1. Background

Stroke remains a major global health problem. Worldwide, cerebrovascular accidents (stroke) are the second leading cause of death and the third leading cause of disability. Out of approximately 15 million people suffering stroke every year; about 5 million, one third, are left with permanent disability [3]. Therefore, stroke is not only a medical problem but also an economic problem, a burden for the whole society, for patients and their families.

Stroke is a medical emergency and affect anyone at any time and as the result patients who have had a stroke are susceptible to many complications such as changes in strength, coordination, and cognitive functions, which directly interfere with activities of daily living (ADL) [4]. Among these things, cognitive impairment is a common manifestation. Post-stroke cognitive impairment (PSCI) is defined as failure in any cognitive domain after stroke: executive function; memory; language; visuo-spatial ability; visuo-constructional ability; or global cognitive function. Previous study have shown that the rate of cognitive impairment of patients with stroke was high (75%), including mainly average cognitive impairment (40%) and mild cognitive impairment (23.3%) [1]. According to Nys GM et al (2005), a high proportion of stroke survivors had met the cognitive impairment within 3 months [5].

In the whole world, there are several studies that have been conducted in order to assess of cognitive impairment in post-stroke patients, but

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in Vietnam, this study were so limited in elderly patients. Therefore, we conducted this research to identify prevalence and characteristics of cognitive impairment in eldery post-stroke patients in National Geriatric Hospital.

2. Subject and method

2.1. Subject

The study was performed on 267 elderly patients diagnosed with stroke at the National Geriatrics Hospital from from February to October 2019.

Inclusion criteria: (1) Patients aged 60 years and older diagnosed with stroke according to clinal symptoms and diagnostic imaging [6]; (2) Post-stroke duration was greater than or equal to 2 weeks.

Exclusion criteria: (1) Patient was diagnosed with transient ischemic attack (TIA) or suffered from brain trauma before this time; (2) Patient had severe condition like respiratory failure, using ventilator...; (3) Patients with inability to communicate; (4) Subjects could not complete the cognitive test.

2.2. Method

The study was a cross-sectional study. The sample was selected according to the entire sampling method. Sample size was calculated using the formula. From the formula, the estimated sample size is n = 254 elderly post-stroke patients. The number of elderly post-stroke patients in our study was 267. Data were collected by using an unified research record.

Variables

Genaral information: Age, gender.

Stroke characteristics: Stroke at the first time or recurrent stroke (medical records); post-stroke duration (weeks); stroke type (ischemic or hemorrhage stroke); location of brainstem lesions (left/right/other); hemiplegia (yes/no).

Cognitive impairment: Assessed by using the Mini-Mental State Examination (MMSE). The Mini-Mental State Exam (MMSE) is a widely used test of cognitive function among the elderly (only take 5 - 10 minutes), it includes 6 parts: Orientation (10 points); Registration (3 points); Attention and calculation (5 points); Recall (3 points); Language (8 points); Ability to copy (1 point). Evaluation results : MMSE is a 30-points questionnaire with cut-off point is 24 points: Normal cognition (24 - 30 points); mild cognitive impairment (20 - 23 points); moderate cognitive impairment (14 - 19 points); severe cognitive impairment (≤13 points) [7].

2.3. Data processing and data analysis

The process of data coding, entry and analysis was done by using Statistical Package for Soci al Science (SPSS) software (version 22.0). Descriptive statistics were adopted to examine characteristic data: frequency, percentage, mean. Inferential statistics was done to perform comparisons between groups: χ^2. Statistical significance was accepted with p-value <0.05.

2.4. Ethical consideration

Study subjects were explained clearly about the purpose of the study, and they were willing to participate in the study. Collected data was used for research. The results of the study were proposed for improving health of community, not for other purposes

3. Result

3.1. General characteristics

The mean age of the patients was 70.5 ± 8.7 years with a minimum of 60 and a maximum of 99. In which, the greatest distribution was generated by patients aged between 60 and 69, with percentage of 52.4%. Secondly, patients at the age of from 70 to 79 and over 80 years old accounted for 31.5% and 16.1%, respectively.

Female subjects made up 39.7% (n = 106) of total number of the sample, which was smaller than distribution of male patients, namely 60.3% (n = 161). The female/male ratio was 0.65.

Table 1. Clinical characteristic of stroke (n = 267)

Characteristics		Frequent (n)	Percentage (%)
Recurrent stroke	Yes	61	22.8
	No	206	77.2
Post-stroke duration	2 - 4 weeks	177	66.3
	5 - 12 weeks	54	20.2
	>12 weeks	36	13.5
Type of stroke	Ischemic	185	69.3
	Hemorrhage	82	30.7
Location of brainstem lesions	Right cerebral hemisphere	107	40.0
	Left cerebral hemisphere	147	55.1
	Others	13	4.9
Hemiplegia	Yes	204	76.4
	No	63	23.6

The majority of study subjects got stroke at the first time (77.2%), while only 22.8% reportedly suffered from stroke twice or more. The number of patients had undergone from 2 - 4 weeks of post-stroke accounted for 66.3%% of total sample. The results showed that the proportion of patients with ischemic stroke (69.3%) was greater than hemorrhage stoke (30.7%). In the location of brainstem lesions, the left hemisphere group occupied the majority (55.1%) while the right hemispheres (40%) and others (4.9%). About assessing the rate of hemiplegia in the participants, the majority patients with hemiplegia is 76.4%.

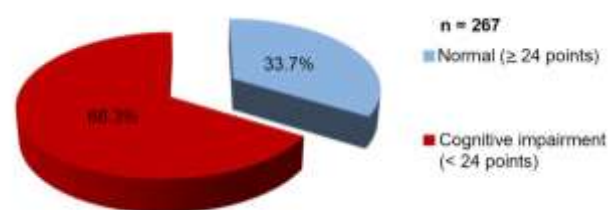**3.2. Characteristics of cognitive impairment in elderly post-stroke patients**

Figure 1. Prevalance of cognitive impairment in elderly post-stroke patients

The total score of MMSE test was ranged from 0 to 30 with the mean score was 18.03 ± 9.303, in which, the greatest distribution was generated by cognitive impairment patients (< 24 points), with percentage of 66.3% and which almost double with normal group (33.7%).
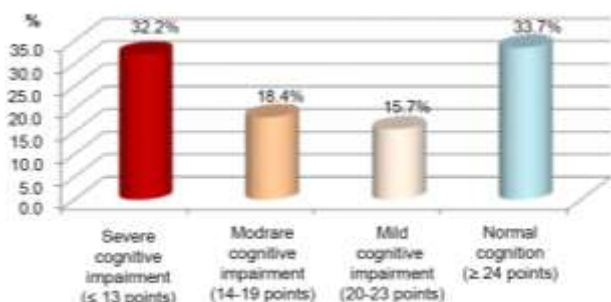
Figure 2. Level of cognition in elderly post-stroke patients distribution (n = 267)

The greatest distribution was generated by patients with normal cognition (33.7%) and decreased gradually from severe cognitive impairment (32.2%) to moderate cognitive impairment (18.4%) and mild cognitive impairment (15.7%).

Table 2. Comparison of components in MMSE test between post ischemic and hemorrhage stroke patients (n = 267)

| Components of MMSE | Score | Type of stroke | | | | p |
| | | Ischemic | | Hemorrhage | | |
		n = 185	%	n = 82	%	
Orientation	0 - 5	42	22.7	27	32.9	>0.05
	6 - 10	143	77.3	55	67.1	
Registration	0 - 1	60	32.4	37	45.1	<0.05
	2 - 3	125	67.6	45	54.9	
Attention and calculation	0 - 2	104	56.2	54	65.9	>0.05
	3 - 5	81	43.85	28	34.15	
Recall	0 - 1	114	61.6	56	68.3	>0.05
	2 - 3	71	38.4	26	31.75	
Language	0 - 3	60	32.4	38	46.3	<0.05
	4 - 8	125	67.65	44	53.7	
Copying	0	103	55.7	70	84.4	<0.05
	1	82	44.3	12	14.6	

By evaluating the components of the MMSE evaluation chart, we found that the registration, the language and the copying ability of hemorrhagic stroke patients were significantly lower than those in the group of ischemic stroke (p<0.05). There was no statistically significant difference in elderly post-stroke patients between 2 types of stroke and 3 components of MMSE (orientation, attention and calculation, recall function).

4. Discussion

The study was conducted at National Geriatric Hospital in patients from 60 years old to over. The patients aged from 60 to 69 years old represented the highest percentage 52.4%. Mean age of respondents was 70.56 years old. This result was equal to mean age in the study of Heruti and colleagues: stroke population characterized in the literature is in the age range of 60 - 74 years [8]. One of the explanations might be older patients had more risk factors like comorbidity diseases. In this study, female subjects made up 39.7% (n = 106) of total number of the sample, which was smaller than distribution of male patients, namely 60,3% (n = 161). The male/female ratio was 1.51/1. This distribution was similar to Nguyen Thi Kim Lien's and colleagues' study conducted in Bach Mai

Hospital: There were 39 male patients (65%) and 21 female patients (35%), the male/female ratio was 1.86/1 [1]. Globally, the female/male ratio is approximately > 1 no matter which country, so the gender ratio in our study is alike to domestic and foreign studies.

To assess cognitive function, the total score of MMSE test was ranged from 0 to 30 with the mean score was 18.03 ± 9.303, in which, the greatest distribution was generated by cognitive impairment patients (< 24 points), with percentage of 66.3% and which almost double with normal group (33.7%). In the study of Nguyen Hoang Ngoc et al (2012) on 107 patients with cerebral stroke for the first time showed that the proportion of patients with cognitive impairment after the first cerebral stroke was 53% [2]. Another study of Renjen (2015) reported that up to 72% of patients have some form of cognitive impairment after a stroke [9]. This study confirms the high prevalence of cognitive impairment after stroke as observed elsewhere in studies done in Finland, Austria and Singapore where the prevalence was found to be 61.7%, 56.3% and 54.5% respectively.

The greatest distribution was generated by patients with normal cognition (33.7%) and decreased gradually from severe cognitive impairment (32.2%) to moderate cognitive impairment (18.4%) and mild cognitive impairment (15.7%). In group had cognitive impairment, severe cognitive impairment was in majority. According to Mukisa et al (2005) in Uganda on 85 post-stroke patients, the proportion of cognitive impairment was fifty-four (63%) of which 23 (27%) and 14 (16%) had mild and moderate cognitive impairment respectively, and 17 (20%) had severe cognitive impairment [10]. The study on 60 patients with stroke of Nguyen Thi Kim Lien et al (2017) detected that the rate of cognitive impairment of patients with stroke was high (75%), including mainly average cognitive impairment (40%) and mild cognitive impairment (23.3%) [1].

By evaluating the components of the MMSE evaluation chart, we found that the registration, the language and the copying ability of cerebral hemorrhage patients were lower than the group of cerebral ischemic. In order, 32.4% of patients with cerebral ischemic stroke compared with 45.1% of patients with cerebral hemorrhage had a registration impaired; 32.4% compared to 46.3% with language impaired ability; 55.7% of the cerebral ischemic group compared with 84.4% of the cerebral hemorrhage group had copying impaired. These difference are statistically significant with p<0.05. This is entirely appropriate with elderly patients; therefore cognitive function was much worse than younger patients. In addition, the proportion of hemorrhagic patients was less than ischemic stroke patients and condition of hemorrhage group tend to be much severe than ischemic group so in general, cognitive function of ischemic patients after acute phase was much worse.

5. Conclusion

This study confirms the high prevalence of cognitive impairment after stroke (66.3%) in which severe cognitive impairment (32.2%) was in majority. Cognitive impairment screening and early diagnosis will help to take remedial measures.

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