The study of independent predictors of ischemic stroke in the elderly patients in Vietnam

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Abstract. The study of independent predictors of acute ischemic stroke (AIS) in the oldest-old (>75 years) with the elderly (from 60-75 years) in Vietnam should be carried out. Data are for 308 consecutive AIS patients aged ≥ 60 years (138 aged >75 years) admitted to the stroke unit of Phu Tho Hospital from (2014-2017). Demographics, pre- stroke disability (modified Rankin Scale ≥3) and comorbidities, AIS etiology and subtype, NIH Stroke Scale (NIHSS) score, clinical and laboratory admission parameters and medical complications were prospectively registered. Independent predictors of in- hospital death, incident disability, length stay, discharge without rehabilitation, and no direct discharge home were identified by multiple logistic regression. Risk profiles before and after age 75 were compared. Poor outcomes were more frequent in the oldest-old (>75 years) compared to the younger patients (≤75 years). NIHSS score, clinical parameters of AIS severity (need for oxygen, indwelling catheter, or nasogastric tube), incidents disability, and medical complications predicted most of the study outcomes in both age groups. After age 75, AIS etiology and subtle proved additional independent determinants for most outcomes along with age, sex, and pre-stroke functional and health status. Identified by multiple logistic regression were as follows: independent predictors pre-stroke and first three days in the hospital of AIS in the oldest- old (> 75 years) were dependent, mechanical ventilation and pneumonia; the patients (≤75 years) was atrial fibrillation were Poor outcomes and death when discharge.

Keywords: acute ischemic stroke; NIHSS score; elderly person; predictive factor; mechanical ventilation; atrial fibrillation

INTRODUCTION

The acute ischemic stroke (AIS) is one of the most devastating neurological diseases, which imposes an enormous burden on the society (Brott and Bogousslavsky, 2000; Mukherjee and Patil, 2011; Leng and Xiong, 2019). It is resulting in decreased quality of life, mortality, increased burden of informal caregivers and high costs to the society (Van Exel et al., 2005; Henriksson et al., 2010; Dewilde et al., 2014). The most common one is the ischemic stroke, which accounts for ~ 85% of the total stroke cases. It occurs as a result of an obstruction within a blood vessel leading to or within the brain. Another major type of stroke is the hemorrhagic stroke, which accounts for 10%–15% of the total stroke cases. It results from a weakened blood vessel that ruptures and bleeds in the brain. The blood then accumulates and compresses the surrounding brain tissue, resulting in brain damage. Unfortunately, only about 1/3 of the patients who are having a stroke are aware of its symptoms, and most bystanders are not knowledgeable about the signs of stroke.

The morbidity associated with a stroke remains high. It is likely that estimates of morbidity and cost burden underestimate the burden of cerebrovascular disease. It is increasingly appreciated, for example, that subclinical cerebrovascular disease – including so-called “silent infarction” identified on brain imaging in up to 28% of the population over age 65, and ischemic white matter disease – is associated with memory loss, dementia, gait impairment, and another functional disability (Vermeer et al., 2007). Furthermore, the global burden of stroke is high, with a stroke remaining the fourth leading cause of death worldwide, with a particularly large impact in developing nations (Feigin et al., 2009; Johnston et al., 2009).

Among different factors that influence to the AIS, two main groups are prevalent – non- modifiable risk factors and modifiable risk factors. Non-modifiable risk factors (also called risk markers) for stroke include age, sex, race-ethnicity and genetics. In general, stroke is a disease of aging (Chen et al., 2010; Forti et al., 2013). The incidence of stroke increases with age. The mean age of incident ischemic stroke in 2005 was 69.2 years. The relationship of sex to stroke risk depends on age (Kapral

et al., 2005; Reeves et al., 2009). At young ages, women have as high or higher risk of stroke as men, though at older ages, the relative risk is slightly higher for men. The higher stroke risk among women at younger ages likely reflects risks related to pregnancy and the post-partum state, as well as other hormonal factors, such as use of hormonal contraceptives. There are well-documented racial disparities in stroke (Gillum, 1999; Cruz-Flores et al., 2011). African Americans are at twice the risk of incident stroke when compared to their white counterparts, and have higher mortality associated with a stroke. Genetic factors are also known to be non-modifiable risk factors for stroke with parental history and family history increasing the risk of stroke. As is the case with other risk factors for stroke, the genetic risks of stroke vary by age, sex and race (Howard G. and Howard V.J., 2001; Cruz-Flores et al., 2011).

The modifiable risk factors are of the utmost importance, as intervention strategies aimed at reducing these factors can subsequently reduce the risk of stroke. Early identification and modification of risk factors is imperative. Modifiable risk factors can be further divided into medical conditions and behavioral risk factors. The role of many "traditional" risk factors in causing stroke, such as hypertension, diabetes, hyperlipidemia, and smoking are well-established (O'Donnell et al., 2010).

As low and middle-income countries, such as Vietnam, experience the health transition to chronic diseases, the morbidity and mortality from a stroke will rise (Nguyen et al., 2010; Tirschwell et al., 2012; Pham et al., 2016; Victor et al., 2019). According to the World Health Organization, by 2030 non-communicable diseases will contribute to three quarters of all deaths worldwide (World Health Organization, 2005). Over the past four decades, age-adjusted population-based stroke incidence rates in high-income countries decreased by 42% whereas the rates in low and middle-income countries increased more than 100%, constituting an epidemic (Avan et al., 2019). Additionally, of the estimated 5.7 million global stroke deaths in 2005, 87% occurred in low and middle-income countries (Strong et al., 2007). Based on the above consideration, the aim of this study was to review the independent predictors of ischemic stroke in the elderly (> 75 years) patients in Vietnam.

METHODOLOGY

Subject

Ischemic strokes account for about 80-85% of brain strokes, which are the leading cause of death and disability. Its incidence increases with age in elderly patients and very elderly patients (> 75 years). To explore independent projections in very elderly patients (> 75 years old) compared to elderly patients (aged 60-75 years) with an ischemic stroke, we conducted this study with criteria: Identify independent factors related to the consequences of AIS in people over 75 years old.

Object: 308 patients ≥ 60 years old (138 patients> 75 years old), suffered from acute cerebral infarction were treated at Phu Tho General Hospital from (2014 - 2017).

Standard selection

The study patients were diagnosed with ischemic stroke according to WHO standards (1989). Clinically, the disease occurs suddenly with focal nerve damage persists for more than 24 hours. CT scans or MRI images show clinically significant new weight reduction images.

Exclusion criteria

Patients with transient ischemic attacks (TIAs), cerebral bleeding, brain tumor, traumatic brain injury, encephalitis. Patient disagrees with the study.

Method

Research design: cross-sectional description

method. Patients are divided into 2 groups:

- **Group 1**: 138 patients > 75 years old (patients group);
- **Group 2**: 170 patients aged 60-75 (control group).

Information collection technique

Patients are examined and assessed according to a unified medical sample: medical history, related factors in the first three days of hospitalization, which aggravate a stroke (NIHSS score, Glasgow score, severity of paralysis, mechanical ventilation, gastric catheterization, catheterization, fever-leukemia increased, complications of pneumonia, urinary inflammation, heart failure, acute renal failure).

Subclinical test

Within 24 hours of receiving, all patients underwent CTscan or brain. MRI to rule out brain bleeding and determine the nature and severity of cerebral infarction; do routine blood tests (red blood cells, hemoglobin, hematocrit, white blood cells, leukocyte formula, platelets) and biochemistry (glucose, urea, creatinine, cholesterol, triglycerides, HDL-C, LDL-C, AST, ALT, electrolytes, albumin); ECG; carotid ultrasound; Echocardiography; monitor electrocardiography 24 hours on holter if suspected cause of cardiac occlusion.

Treatment

All patients are treated according to a uniform procedure, such as neurological-vascular resuscitation; treatment of complications, taking aspirin100 mg / day or clopidogrel l75 mg / day, if there are no contraindications; rt-PA treatment for 4.5 h or removal of thrombus with mechanical devices for the first 6 h or decompression cranial surgery if indicated; early rehabilitation; prescription of relapse prevention, counseling home care, follow-up appointments periodically.

Analyze and process data

According to medical statistical methods, SPSS 16.0 software; percentage, tested by the test of χ^2; t-Student, 95% confidence, probability is statistically significant when $p < 0.05$.

Ethical aspect of the topic

All patients or relatives were explained, discussed carefully and voluntarily participated in the study. The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000.

RESULTS

Between two groups number of mails were 77 (55.8 %) within Group 1 and 101 (59.4 %) – in the Group 2. Simultaneously, femails were 61 (44.2 %) and 69 (40.6 %) respectively. As the reasons for admission were as follows: hemiplegia (93 (67.4 %) vs 101 (59.4 %)); headache (7 (5.1 %) vs 17
(10 %); dizzy (4 (2.9 %) vs 4 (2.4%)); speak hard (10 (7.3%) vs 17 (10 %); dreamy

(20 (14.5 %) vs

23 (13.5%)) and comatose (8 (5.8 %) vs 12 (7.1%)) for Group 1 and 2 respectively. There was no significant difference (p> 0.05) in terms of age and gender as well as reasons for admission to the two patient groups.

Also, there was no significant difference (p> 0.05) between the treatment time of two patients

≤ 75 years old and over 75 years old. In particular, duration (per days) of treatment by age group was: <10 (61 (44.2 %) vs 75 (44.1 %)); 10 – 19 (52 (37.7 %) vs 66 (38.8 %)); 20 – 29 (19 (13.8 %)

vs 21 (12.4 %)); 30 – 39 (5 (3.6 5) vs 6 (3.5 %)) and ≤40 (1 (0.7 %) vs 2 (1.2 %)).

Table 1. Predictive factors before AIS by age group

Forecasting factor	Group 1 (n, %)	Group 2 (n, %)	p
Male	77 (55.8%)	101 (59.4)	0.523
Hypertension	125 (90.6%)	157 (92.4%)	0.578
Diabetes	20 (14.5%)	39 (22.9%)	0.061
Metabolic lipid disorders	53 (38.4%)	73 (42.9%)	0.421
History of stroke	37 (26.8%)	25 (14.7%)	0.008
Support in living	31 (22.5%)	21 (12.4%)	0.018
Coronary artery disease	17 (12.3%)	10 (5.9%)	0.047
Tin valve disease	7 (5.1%)	6 (3.5%)	0.503
Atrial fibrillation	15 (10.9%)	8 (4.7%)	0.041
TIA	28 (20.3%)	33 (19.4%)	0.848
Fat	10 (7.3%)	10 (5.9%)	0.629
Tobacco addiction	10 (7.3%)	37 (21.8%)	<0.001
Alcohol abuse	2 (1.5%)	10 (5.9%)	0.046
Celibacy	4 (2.9%)	3 (1.8%)	0.386
Economic difficulties	25 (18.1%)	32 (18.8%)	0.874

The proportion of patients over 75 years old has a higher proportion of predictive factors for stroke (stroke history, need for support in daily life, coronary artery disease, atrial fibrillation) than the age group <75 years old (p <0 .05); but in patients ≤ 75 years old, the rate of tobacco addiction and alcohol abuse is higher (p <0.05) (Table 1). The 49 patients (35.5 %) of Group 1 and 45 (26.5 %) of Group 2

were admitted to the hospital before 6 days after AIS. The 89 patients (64.5 %) of Group 1 and 125 (73.5 %) of Group 2 were admitted to the hospital after 6 days. Their baseline data are presented in Table 2. However, there was no significant difference (p> 0.05) between the frequency of occurrence of predictive factors before treatment and in the first three days of hospitalization in patients in both groups (Table 3).

Table 2. Prediction factors for the first three days of hospital stay by age group

		Group 1 (n, %)	**Group 2 (n, %)**	**p**
NIHSS	0 - 6	111 (65.3%)	71 (51.5%)	0.043
	7 - 15	30 (17.7%)	31 (22.5%)	
	> 15	29 (17.1%)	36 (26.1%)	
Glasgow	3 - 7	7 (4.1%)	9 (6.5%)	0.630
	8 - 12	44 (25.9%)	36 (26.1%)	
	13 - 15	119 (70.0%)	93 (67.4%)	
Degree of	0	18 (11.3%)	19 (15.0%)	0.001
paralysis (n=287)	1	22 (13.8%)	38 (29.9%)	
	2	21 (13.1%)	21 (16.5%)	
	3	47 (29.4%)	29 (22.8%)	
	4	43 (26.9%)	15 (11.8%)	
	5	9 (5.6%)	5 (3.9%)	
Breathe oxygen		104 (61.2%)	109 (79.0%)	0.001
Breathing machine		17 (10.0%)	30 (21.7%)	0.004
Stomach catheter		23 (13.5%)	33 (23.9%)	0.019
Urinary catheter		14 (8.2%)	19 (13.8%)	0.118
Fever		25 (14.7%)	31 (22.5%)	0.079
Leukocytosis increased		42 (24.7%)	47 (34.1%)	0.072
Pneumonia		31 (18.2%)	47 (34.1%)	0.001
Urinary infections		1 (0.6%)	1 (0.7%)	0.696
Acute heart failure		1 (0.6%)	2 (1.5%)	0.422
Acute renal failure		1 (0.6%)	3 (2.2%)	0.237

The univariate analysis showed that several predictive factors for stroke were significantly associated (p <0.05) with worsening and mortality (Table 4), including:

- In patients > 75 years of age: The risk of getting worse and dying is 4.47 times

higher if coronary artery disease; 10.71 times with valvular heart disease; 20.83 times with atrial fibrillation; 3.42 times with TIA and 4.47 times if alcohol abuses.

- In patients ≤ 75 years old: The risk of getting worse and dying is 4.12 times higher if they need to support living; 3.57 times for coronary artery disease and 3.54 times for atrial fibrillation.

However, after logistic multivariate regression analysis, among patients ≤ 75 years old, only the atrial fibrillation factor was an independent prognostic factor with a risk of worsening and death was 72.05 times. The group of patients over 75 years of age who need support in daily activities is an independent prognosis factor with a 3.51 times higher risk of death.

Table 3. Frequency of prediction factors by age group

Frequency predictor of pre-stroke			**Frequency of the predictor in the first 72 hours of hospital stay**	
Frequency forecast factor	**Group 1 (n, %)**	**Group 2 (n, %)**	**Group 1 (n, %)**	**Group 2 (n, %)**
0	1 (0.7%)	0	4 (2.9%)	2 (1.2%)
1	29 (21.0%)	33 (194%)	17 (12.3%)	20 (11.8%)
2	43 (31.2%)	45 (26.5%)	31 (22.5%)	56 (32.9%)
3	28 (20.3%)	54 (31.8%)	19 (13.8%)	36 (21.2%)
4	17 (12.3%)	22 (12.9%)	22 (15.9%)	20 (11.8%)
5	10 (7.3%)	10 (5.9%)	8 (5.8%)	11 (6.5%)
6	7 (5.1%)	4 (2.4%)	12 (8.7%)	6 (3.5%)
7	0	0	9 (6.5%)	7 (4.1%)
8	2 (1.5%)	1 (0.6%)	6 (4.4%)	7 (4.1%)
9	1 (0.7%)	1 (0.6%)	6 (4.4%)	3 (1.8%)
10			4 (2.9%)	2 (1.2%)
	P = 0.366		P = 0.142	

The univariate analysis showed that several predictive factors during the first three days of hospitalization were significantly associated ($p < 0.05$) with worsening morbidity and mortality including:

- In patients over 75 years of age, the risk of getting worse, death is 7.48 times higher if the NIHSS score is> 15 points; 9.84 times if there is Glasgow <13 points; 556.25 times if mechanical ventilation; 135.94 times if stomach catheterization; 53.21 times with Urinary catheterization; 9.63 times with fever; 13.90 times if leukocytes increases and 16.93 times if pneumonia.
- In patients ≤ 75 years old, the risk of getting worse, death is 5.83 times higher if there are NIHSS scores> 15 points; 6.45 times if Glasgow <13 points; 4.10 times if oxygen is needed;

  52.0 times if mechanical ventilation; 38.45 times if gastric catheterization; 39.67 times if Urinary catheterization; 8.99 times if the fever; 9.82 times if leukocytes increase and 18.31 times if pneumonia complications.

Table 4. Relationship between some predictive factors for stroke and worsening / death from stroke in two groups

Forecasting factor	**Group 1 (n, %)**				**Group 2 (n, %)**			
	OR raw (95% CI)	**p**	**OR correct. (95% CI)**	**p**	**OR raw (95% CI)**	**p**	**OR correct. (95% CI)**	**p**
Male	1.13 (0.5-2.4)	0.761	1.10 (0.5-2.7)	0.834	2.40 (0.7-7.8)	0.132	5.12 (0.8-31.0)	0.076
Hypertension	0.84 (0.2-2.9)	0.785	1.0 (0.2-4.2)	0.993	1.36 (0.2-11.2)	0.774	0.73 (0.1-9.6)	0.813
Diabetes	0.62 (0.2-2.0)	0.416	0.65 (0.2-2.3)	0.512	1.04 (0.3-3.4)	0.952	1.58 (0.3-7.3)	0.556
Metabolic lipid disorders	0.91 (0.4-2.0)	0.817	0.71 (0.3-1.7)	0.441	0.92 (0.3-2.6)	0.877	0.65 (0.2-2.7)	0.552
AIS history	1.95 (0.9-4.4)	0.102	1.77 (0.7-4.5)	0.239	1.28 (0.3-4.8)	0.719	0.96 (0.2-5.5)	0.960
Living support	4.12 (1.7-10.0)	0.001	3.51 (1.2-10.4)	0.024	2.46 (0.7-8.5)	0.141	2.13 (0.3-14.7)	0.442
Coronary artery disease	3.57 (1.2-10.4)	0.012	1.64 (0.4-7.5)	0.525	4.47 (1.0-19.7)	0.030	0.98 (0.1-14.5)	0.989
Heart valve disease	2.06 (0.4-9.8)	0.353	0.80 (0.1-5.8)	0.822	10.71 (1.9-61.9)	0.001	6.66 (0.5-93.5)	0.160
Atrial fibrillation	3.54 (1.2-10.9)	0.018	1.91 (0.4-9.2)	0.421	20.83 (3.8-112.3)	0.001	72.05 (7.0-7.42)	0.001
TIA	1.99 (0.8-4.8)	0.120	0.85 (0.2-2.9)	0.792	3.42 (1.2-10.0)	0.017	3.96 (0.9-17.9)	0.073
Fat	0.64 (0.1-3.2)	0.581	0.79 (0.2-4.2)	0.784	2.42 (0.5-12.6)	0.279	5.17 (0.6-44.7)	0.136
Tobacco addiction	1.84 (0.5-7.0)	0.361	2.91 (0.6-14.1)	0.183	1.58 (0.5-4.8)	0.422	0.76 (0.1-4.8)	0.770
Alcohol abuse	-	0.382	-		4.47 (1.0-19.7)	0.030	2.26 (0.2-25.3)	0.508
Celibacy	0.87 (0.1-8.7)	0.909	0.79 (0.1-10.6)	0.856	-	0.561	-	
Economic	2.02 (0.8-5.1)	0.125	1.59 (0.5-5.0)	0.423	1.94 (0.6-6.0)	0.241	1.80 (0.4-8.0)	0.439

difficulties								
Hospitalization > 6h	1.27 (0.6-2.8)	0.554	3.34 (0.6-19.8)	0.183	0.85 (0.3-2.6)	0.773	1.79 (0.1-17.5)	0.675
NIHSS> 15	5.83 (2.4-14.3)	0.001	0.79 (0.1-6.2)	0.825	7.48 (2.4-23.0)	0.001	$2.98*10_{-8}$	0.996
Glasgow <13	6.45 (2.6-15.7)	0.001	3.53 (0.6-22.2)	0.179	9.84 (2.8-3.6)	0.001	$7.65*10_{-7}$	0.998
Paralysis:	0.15 (0.1-0.5)	0.001	0.3 (0-3.1)	0.341	-		-	
0, 1, 2	4.10 (1.1-14.9)	0.020	0.96 (0.1-13.4)	0.976	-		-	
Breathe oxygen	52.0 (9.5-183.9)	0.001	22.71 (1.9-265.1)	0.013	556.25 (9.2-3485)	0.001	$1.49*10_{-5}$	0.997
Mechanical ventilation	38.45 (8.7-169.7)	0.001	1.93 (0.2-20.0)	0.580	135.94 (12.4-1493)	0.001	14.09 (0.3-626.1)	0.172
Stomach catheter	39.67 (6.2-253.7)	0.001	3.79 (0.3-46.2)	0.297	53.21 (9.2-309.1)	0.001	6.67 (0.2-222.7)	0.289
Urinary catheter	8.99 (3.3-24.5)	0.001	0.60 (0.1-5.0)	0.638	9.63 (3.0-30.9)	0.001	0.05 (0-4.7)	0.197
Fever	9.82 (3.7-26.1)	0.001	0.46 (0.1-4.2)	0.493	13.90 (3.8-51.2)	0.001	6.32 (0.1-287.8)	0.344
Leukocytosis increased	18.31 (5.7-58.4)	0.001	19.90 (2.5-156.6)	0.004	16.93 (4.7-61.6)	0.001	14.2 (0.4-561.2)	0.156
Acute heart failure	5.50 (0.5-64.4)	0.126	20.23 (0.6-650.1)	0.089				

However, after logistic multivariate regression analysis, in the group of patients over 75 years old, only the factor of mechanical ventilation and pneumonia are an independent prognosis factor with severe condition, death increased to 22.71 times if mechanical ventilation and 19.90 times if complications of pneumonia; in patients ≤ 75 years of age, prognostic factors independently of the worsening and death have not been found.

There was a significant difference ($p < 0.001$, chi – squared test) between discharge status after 6 months by age group. Patients ≤ 75 years old with higher stability, recurrence and death are lower than patients over 75 years old (Table 5).

Table 5. Condition after 6 months of discharge from hospital in two groups

Status of discharge from hospital after 6 months	**Group 1 (n, %)**	**Group 2 (n, %)**	**p**

Stability	47 (48.0%)	132 (87.4%)	
Occur again periodically	29 (29.6%)	14 (9.3%)	p<0.001
Dead	22 (22.5%)	5 (3.3%)	

DISCUSSION

Several factors predict stroke by age group

Stroke is a leading cause of death and motor disability, a major contributor to increased health care costs. The risk of stroke increases with life expectancy, according to the statistics, the oldest subjects (≥75 years old) with a stroke account for more than 1/3 of the hospitalizations, they have mortality rates and disability. The risk of developing a stroke is higher, because it is often ignored in clinical trials and there is very little information about the causes of stroke. On the other hand, patients in this age group have less stamina and are more difficult to recover after being sick due to aging over time.

According to our research results, there is a statistically significant difference between the rates of several stroke prediction factors by age group. Patients younger than 75 years old have a lower rate of stroke, need support in life, coronary artery disease, and atrial fibrillation but have a higher rate of smoking, alcohol abuse than patients > 75 years old. Patients > 75 years old, risk of getting worse, dying in supportive life, coronary artery disease, atrial fibrillation. But in the logistic multivariate regression analysis, in the patients age <75 years, only AF factor is an independent prognostic factor with aggravation and death, in patients> 75 years of age, support for living is Independent prognostic factor with aggravation and death.

There was a statistically significant difference between several predictive factors in the first three days of hospitalization by age group. Patients > 75 years of age had high NIHSS scores, oxygen, mechanical ventilation, gastric catheterization, and pneumonia complications were higher than those aged ≤ 75 years. After multivariate logistic regression analysis, in the > 75-year-old patient group, only the mechanical ventilation and pneumonia factors were independent prognostic factors with worsening and death. In patients younger than 75 years of age, independent prognostic

factors have not been found to be exacerbated or fatal.

The predictor for the first three days of hospital stay

Some factors predicting the severity of illness and death in the first three days of hospitalization are statistically: oxygen support at 69.2%, Glasgow score (<13 points 31.2%, <8

points 5.2 %, 8-12 points 26.0%), the proportion of patients with risk factors is (2 factors 28.3%, 3 factors 17.9%). It is well know that the patient had two factors that were clearly related to death, coma on admission and advanced age.

Investigated the association between several major risk factors and mortality in patients after 5 years of stroke includes cardiovascular disease. The chance of surviving after 5 years is only 25%, if they only have 1 of these 2 risk factors, then the chance of surviving after 5 years is 50% and without both of these risk factors then the 5-year survival rate is 75%. When multivariate regression analysis related to mortality, of the 10 factors, only 3 factors were a coma, muscular disorders and increased systolic blood pressure when hospitalized related to mortality within one year after a stroke ($p < 0.05$). Le Tu Phuong Thao when studying the prognosis of the following circulating NMN showed as follows: age> 75 years, consciousness disorder (mild or severe) and cardiac embolism mechanism related to poor prognosis at discharge. Tran Thanh Hung and Vu Anh Nhi found that two factors with independent predictive mortality were Glasgow score and vertical doll eye reflex before incubation ($p < 0.005$). We recognize that the above factors need special attention in evaluating and establishing an active treatment regimen for patients to reduce death and disability.

Several factors related to the outcome of treatment

Statistical results showed a significant relationship ($p < 0.05$) between the age of the patient and the condition of exiting stroke unit. Patients aged 60-69 years are at risk of getting worse / dying less than 2.54 times 70-79 years old, 4.03 times 80-89 years old and 9.50 times younger than 90 years old. It can be seen that, in the elderly, the process of recovery will become more difficult due to the aging according to the age of the body's organs, so the older the patient's recovery and remission rate is, the lower the higher the death rate.

When patients have many risk factors at the same time, the condition of hospital discharge rate will be higher or death will be higher. The study showed that if one factor was increased, the risk of getting worse / death at the time of the stroke increased by 1.50 times. However, after 6 months of discharge, we did not find a statistically significant relationship ($p > 0.05$) between the frequency of occurrence of risk factors before a stroke and the condition 6 months after discharge. Some risk factors in the first three days of hospital stay include as follows: Patients with NIHSS scores from 0-6 points have an increased risk of death / death 2.45 times lower than patients with NIHSS from 7-15 points and lower 8.97 time patients with NIHSS > 15 points. Baird et al. (2001), Dawodu and Danesi (2005), Sato et al. (2008) appreciate the role of the NIHSS scale in assessing the severity of stroke. The higher the NIHSS patients' score, the higher the odds of death or death. Patients 6 months after discharge from the hospital with NIHSS score from 0-15 points have a lower risk of death by 4.64 times than patients with NIHSS > 15 points.

The predicted value of the Glasgow scale is also shown when examining the odds ratio: If taking patients with Glasgow scores from 13-15 points as a group for comparison (OR = 1), the remaining two groups are Glasgow from 3 -7 points and Glasgow from -12 points respectively have an OR of 46.7 and an OR of 4.62. Thus, if patients with Glasgow score of 13-15 points are at risk of aggravation / death lower than 4.62 times for patients with Glasgow from 8-12 points and 46.7 times lower for patients with Glasgow from 3 -7 points. Our results are similar to those of Miah MT et al. When evaluating stroke patients with a score of Glasgow from 3-8 points with a death rate of 12.07%, Glasgow with a score of 13-15 points without a patient dead. Hamidon and Raymond studied 218 patients with a stroke (163BNN) found that in NMN group, the score of Glasgow less than 9 points had significant prognosis and death 3.9 times (OR = 3.9; 95% CI 1.01- 14.6) compared to a team with a Glasgow score of over 9 points.

About the degree of paralysis: patients with paralysis (0, 1, 2) have a 16.13 times higher risk of death / death from the stroke unit (3, 4, 5). And after 6 months, patients with paralysis (3, 4, 5)

have a 0.43 times lower risk of dying (0, 1, 2).

Patients who undergo supplemental oxygen, mechanical ventilation, gastric catheterization, catheterization are at greater risk of death / death than those who do not receive oxygen, do not receive mechanical ventilation, do not place gastric catheter and catheter. Patients with fever, leukocytosis, and pneumonia also have a higher risk of death / death than patients without these symptoms ($p < 0.05$).

There was a statistically significant relationship ($p < 0.05$) between the frequency of occurrence of risk factors in the first three days of hospital stay and the time of exiting stroke unit and after 6 months of hospital discharge if The increased risk of death / death from a stroke increases with a predisposing factor.

CONCLUSION

Some important conclusions could be drawn after current study. Firstly, a number of factors exacerbate and contribute to poor outcomes in patients over 75 years of age with acute ischemic stroke. Predictive factors leading to aggravation of illness and death include as follows: daily life support, coronary artery disease, valvular heart disease, atrial fibrillation, TIA attacks, alcohol abuse; Multivariate logistic regression analysis only had to support daily life as an independent prognostic factor that exacerbates illness or death at discharge.

Predictive factors in the first three days of hospitalization that aggravate illness and death include as follows: NIHSS score> 15 points, Glasgow <13 points, paralysis (0 - 2), assisted oxygen, mechanical ventilation, tube placement gastric catheter, catheterization, fever-leukemia increased, pneumonia complications; Multivariate logistic regression analysis that included only mechanical ventilation and pneumonia was an independent prognostic factor with exacerbation and death upon discharge.

The six-month post-discharge postpartum: the patients over 75 years of age are stable, the recurrence and death are lower than the 75-year-old groups or younger.

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CONFLICTS OF INTERESTS

The authors declare no conflict of interests.

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