Prevalence and Risk Factors for Post Stroke Depression in Patients with Acute Ischemic Stroke in Rajavithi Hospital

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ABSTRACT

Introduction: Acute ischemic stroke is a sig nificant health burden in Thailand. Based on previous records, the prevalence of acute ischemic stroke is 1.88% among Thai individuals aged 45 and above. It is a leading cause of death, with 50-60% of stroke survivors experiencing persistent disability. According to multiple studies the prevalence of post stroke depression is higher than normal population. Risk factors for post stroke depression include pre-existing psychological issues, female gender, age below 70, severity of acute ischemic stroke and the extent of disability established after the stroke event. Survivors of stroke with post stroke depression exhibit a lower quality of life compared to those without depression.

Objectives: To assess the prevalence and risk factors of Post stroke depression in patients with acute ischemic stroke in Rajavithi hospital

Materials and Methods: This study is cross sectional study. The study protocol was approved by Rajavithi Research ethics committee. Participants recruitment occurring between January 1st, 2022 to December 31st, 2023.

Results: In the participated individuals, the majority of the participants experienced mild stroke and mild disability. There is no occurrence of post stroke depression among patients with acute ischemic stroke at Rajavithi hospital.

Conclusion: Acute ischemic stroke is not significantly associated with higher prevalence of depression compared with normal population. The study outcome is different from earlier study. The data from this study can be applied with other study in the future to reevaluate post stroke depression status.

Keywords: Acute ischemic stroke, Depression, Post stroke depression

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Introduction

Acute ischemic stroke is an important health burdens in Thailand. According to previous record the prevalence of acute ischemic stroke is 1.88% among Thai population aged over 45 years and also conducted as an important cause of death with over 50,000 deaths annually and 50-60% of the stroke survivors are still suffered from disability.[1] The prevalence of poststroke depression could be upto 72.5%.[2]

Risk factors of post stroke depression were psychological problems prior to stroke events, female gender, age under 70, severity of acute ischemic stroke, post stroke functional impairment. The protective factor was appropriate social and family supports.[3-5] The association between types of stroke and post stroke depression demonstrated different results from each study.[6]

The stroke survivors with depression were found having lower quality of life in all aspects and higher all cause mortality compared with those without depression.[7,8]

Objective

1. To assess the prevalence of post stroke depression in patients with acute ischemic stroke in Rajavithi hospital

2. To assess the risk factors of Post stroke depression in patients with acute ischemic stroke in Rajavithi hospital

Materials and Methods

Study designs and settings

This cross-sectional study was approved by Rajavithi research ethics committee, Bangkok, Thailand. The study was conducted at the Neurology department in Rajavithi hospital. Recruitment of study participants was performed from January 1st, 2022 to December 31st, 2023.

Study participants

Patients with acute ischemic stroke who admitted in Rajavithi hospital in the period of January 1st, 2022 to December 31st, 2023 were enrolled. All participants were provided written informed consent.

Inclusion criteria

- Aged over 18 years
- Diagnosed with acute ischemic stroke within 7 days after the event according to recorded history, physical examination, radiographic diagnostic investigation including CT and MRI
- All patients were admitted at stroke unit, Rajavithi hospital
- Patients who were completely evaluated for post stroke depression in 0-7 days after the stroke event

Exclusion criteria

- Incomplete information recorded in the hospital database
- Unable to evaluate the depression questionaire
- Patients with pre-existing depressive condition prior to the stroke onset

Withdrawal criteria

- Subjects refuse to participate in the research

Sample size calculation

The data were collected from patients admitted in Rajavithi hospital in the period of January 1st, 2022 to December 31st, 2023. Using one proportion formula.[9]

$$n = \frac{Z^2_{\alpha/2} p(1-p)}{d^2}$$

n = sample size

$Z_{\alpha/2}$ = area under the curve

α = 0.05 is 1.96

p = prevalence of post stroke depression as 42.5 according to the study by Fred Stephenet al.[5] in 2015, p = 0.425

d = standard deviation 20% of p-value thus d = 0.20 x 0.425 = 0.09

The number of sample size was calculated

$$n = \frac{(1.96)^2 \times 0.425\ (1-0.425)}{(0.09)^2}$$

n = 116 subjects + missing data 10%

= 130 subjects

Therefore, the sample size should be 130 subjects

Material and Method

We collected demographic information of each participant including: gender, age, income, mariatal status, education level, underlying diseases, occupation, smoking status, current medication, reimbursement method.

Clinical information including: severity of ischemic stroke using NIHSS, types of ischemic stroke (TOAST classification), functional impairment (mRS), duration from the stroke event until the point depression assessment was done(days)

The post stroke depression status was evaluated by standard quesionaire (2Q-9Q-8Q)

Statistical analysis

Descriptive statistics

Categorial data were reported as percent, continuous data with normal distribution were reported using mean and SD, continuous data with abnormal using interquartile range; IQR, percentile rank

Inferential statistics

Comparation of categorical data using Chi-square test or Fishers' exact test or McNemar test. Comparation of continuous data in two distinct groups of population using student T-test (normal distribution), Mann-Whitney U- test (abnormal distribution). Analysis of statistically related using BinaryLogistic regression, OR (95% CI) with P value of <0.05

Results

Table 1. Demographic data and clincal characteristics (n = 129)

Demographic data		n (%)
Gender		
	Female	78 (60.5)
	Male	51 (39.5)
Age (years), Mean±SD		58.11±13.77
Mariatal status		
	Married	83 (64.3)
	Single, divorced, widowed	46 (35.7)
Occupation		
	Freelance	81 (62.8)
	Business owner	16 (12.4)
	Government officer	5 (3.9)
	Retired	5 (3.9)
	Others	22 (17.1)
Education		
	Below bachelor degree	88 (68.8)
	Bachelor degree	35 (27.3)
	Over bachelor degree	5 (3.9)
Average income per month		
	≤ 20000	97 (75.2)
	20,001-30,000	18 (14.0)
	30,001-40,000	7 (5.4)
	> 40,000	7 (5.4)
Smoking status		
	Never smoke	90 (69.8)
	Current smoke	27 (20.9)
	Ex smoke	12 (9.3)
Reimbursement (Medical service payment method)		
	Universal coverage forThai citizen	86 (66.7)
	Social security	29 (22.5)
	Healthcare benefit for government officer	13 (10.1)
	Healthcare benefit for state enterprise officer	1 (0.8)
Pre existing medical condition		94 (72.9)
	Hypertension	75 (79.8)
	Dyslipidemia	46 (48.9)
	Type 2 diabetes mellitus	32 (34.0)
	Old CVA	23 (24.5)
	Coronary artery disease	13 (13.8)
	Valvular heart disease	13 (13.8)
	Atrial fibrillation	9 (9.6)
	Chronic kidney disease	9 (9.6)
	Cirrhosis	1 (1.1)
Current medication		82 (63.6)

Table 1 demographic data demonstrated that 60.5% of the subjects were female, mean age of 58.11±13.77years, 64.3% were married, 62.8% freelance, 68.8% complete education under bachelor degree, 69.8% never smoke, 75.2% earned average income less than 20,000 THB, 72.9% had pre-existing medical condition which is mainly hypertension (79.8%).

Table 2. Clinical characteristics (n = 129)

Clinical characteristics	n (%)
Types of ischemic stroke (TOAST Classification)	
Lacunar infarction	87 (67.4)
Large artery atherosclerosis	24 (18.6)
Cardioembolic stroke	15 (11.6)
Stroke due to other etiology	3 (2.3)
Severity of neurological deficit (NIHSS), Median (Q1-Q3)	3 (1 - 14)
mild (0- 4 points)	98 (76.0)
moderate (5 - 25 points)	31 (24.0)
severe (> 25 points)	0 (0.0)
Post stroke functional impairment (mRS), Median (Q1-Q3)	2 (1 - 4)
None or mild impairment (0 - 2 points)	101 (78.3)
Moderate to severe impairment (3 - 6 points)	28 (21.7)
Duration from stroke onset until depression assessment (days), Median (Q1-Q3)	1 (0 - 3)

Table 2 clinical characteristics data revealed that 67.4% of subjects had lacunar infarction. The majority of the subjects (76.0%) had mild neurological deficit (NIHSS 0-4) with the median NIHSS score of 3. Post-stroke functional impairment was mild in 78.3% of the casese with median mRS score of 2. The median duration from the onset of cerebrovascular disease to the assessment of depressive symptoms was 1 day, range from 0 to 3 days.

Table 3. Post stroke depression status (n = 129)

Post stroke depression	n (%)
Depression	
Without depression	100 (100.0)
With depression	0 (0.0)
Evaluation of screening 2Q questionnaire, Median (Q1-Q3)	0 (0 - 1)
point	127 (98.4)
1-2 point	2 (1.6)
Evaluation of 9Q questionaire (n = 2), Median (Q1-Q3)	0 (0 - 5)

Table 3 the prevalence of post stroke depression in this study was 0%.

Discussion

According to data collection and analysis, this research demonstated that the prevalence of post stroke depression is 0 in Rajavithi hospital.

The majority of study population consists of female (60.5%) mean age 58.11 years and lower education status which 68.8% lower than bachelor. 75.2% has income lower than 20,000 THB. 69.8% never smoke. 72.9% had preexisting comorbid, mainly hypertension (79.0%)

The majority of this study population has minor stroke with NIHSS 1-4 at the number of 76.0% and 78.3% has mild disabling (mRS 0-2). 67.4% were diagnosed as lacunar infarction.

The evaluation of depression using 2Q-9Q-8Q questionnaire with sensitivity of 73 and specificity of 90. A recent guideline from American Heart Association and American Stroke Assocication recommended the CES-D and GDS as valid tools for screening for depression among stroke subjects (with 93.3% sensitivity and 94.2% specificity). Due to the lower sensitivity of the test used in this study, the ability to detect depression might be lower than other studies.

According to multiple meta-analysis studies the prevalences of post stroke depression may varies at the different time intervals.[3,10] The meta-analysis published in 2013[3] demonstrated that the prevalence of post stroke depression was highest at the duration of 6-12 months after stroke onset with the number of 33%. Another study in Thailand in 2014 using TGDS to evaluate post stroke depression found that the prevalence of post stroke depression was 72.5%.[2]

The evaluation of depression at different time point in our study could be the explaination why prevalence of post stroke depression was lower compared to previous studies.

Multiple studies revealed that one of significant risk factors of post stroke depression was post stoke functional impairment.[4-6] Some study found that low socioeconomic status, smoking, low education level, severe neurological deficit (higher NIHSS) was statistically associated with post stroke depression as risk factors.[4,11]

In our study the majority of the enrolled patients had mild neurological deficit (NIHSS 1-4) and mild functional impairment (mRS 0-2) with the number of 76.0% of 78.3% repectively.

These clinical characteristics of the majority of the study population probably explain the low prevalence of post stroke depression in our study.

Conclusion

Our study demonstrated that the prevalence of post stroke depression in patients with acute ischemic stroke in Rajavithi hospital was found to be 0 at 0-3 days after stroke onset. The information from the study can be applied for further research assessing post stroke depression at the different time periods.

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