Functional Recovery at 3 Months in Stroke Patients Not Receiving Thrombolytic Therapy: The Comparison Between Patients Arriving Earlier and Later Than 4.5 Hours

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Background: We aim to study the recovery of functional abilities of stroke patients who did not receive recombinant tissue plasminogen activator (rtPA) after treatment for 3 months comparing patients who arrived at a hospital within 4.5 hours and those who arrived after 4.5 hours of symptom onset. Also, we investigated the predictors of the functional recovery and the quality of life (QOL) at 3 months after stroke. *Material and Method:* Data were collected by interviewing the stroke patients and caregivers twice on Day 1 and at 3 months after the stroke onset. We collected the demographic data, Modified Rankin Scale (mRS), Barthel Index, National Institutes of Health Stroke Scale (NIHSS), Glasgow Coma Scale (GCS), and World Health Organization Quality of Life–Bref–Thai (WHOQOL-Bref-Thai). *Results:* Eighty-eight and 85 patients arrived at a hospital within 4.5 and after 4.5 hours respectively. At 3 months after treatment, the recovery of stroke patients as assessed by mRS, Barthel Index, and the QOL in both groups did not differ significantly ($P > .05$). Approximately 80% in both groups had good QOL. Both groups of patients had a similar low stroke awareness and knowledge in terms of risk factors ($P = .825$) and care of stroke patients ($P = .562$). Four variables that significantly predicted the improvement of the mRS score at 3 months after treatment were age 60 years and younger, premorbid self-care ability, the NIHSS score of 14 or less and Day 1 mRS score. *Conclusion:* Stroke patients arriving at the hospital within and after 4.5 hours of the onset who did not receive the rtPA did not have significant differences in the functional outcomes and quality of life at 3 months. However, the eligibility for rtPA is not known before arriving at the hospital so that the necessity of seeking medical treatment as quickly as possible is still warranted. Increasing effective public awareness regarding stroke risk factors and care should be implemented. **Key Words:** Stroke—thrombolytic therapy—recovery—functional abilities—quality of life.
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Background

Stroke is a major health burden disease worldwide and is also the leading cause of death in Thailand (10.7%).[1] It is the most common cause of disability and dependency in activities of daily living in the older population. Stroke can affect multiple domains of life such as physical, psychological, and financial aspects of patients, families, and society.[2] Recombinant tissue plasminogen activator (rtPA) is recommended to be used in ischemic stroke patients arriving at a hospital within 4.5 hours after the stroke onset.[3,4] However, most of previous studies revealed

that only less than 10% of stroke patients are eligible when using the inclusion criteria for the treatment with rtPA.[5-8] Moreover, most patients, including those receiving rtPA, still suffer from the disabilities from stroke.

The objective of this study is to study the effect of early arrival at a hospital within 4.5 hours after symptom onset on the functional recovery and quality of life in stroke patients who did not receive the rtPA. Also, we want to study the factors that affect the recovery of functional abilities of stroke patients, quality of life in stroke patients who did not receive rtPA, and predict the recovery of functional abilities in stroke patients who did not receive rtPA.

Materials and Methods

This study is a prospective cohort study design. The studied population included stroke patients admitted in Saraburi hospital from December 23, 2010 to August 31, 2011. The main inclusion criteria were, (1) patients aged 18 years and over, (2) those diagnosed with ischemic stroke or hemorrhagic stroke confirmed by a doctor, (3) in cases of patients with disorders of consciousness or communication caused by stroke, there had to be caregivers who were able to be interviewed, and (4) in cases of patients and caregivers having trouble reading and writing, the author read or completed the record and patients voluntarily participated in this study. Patients were excluded if they (1) received diagnosis of head injuries, tumors, central nervous system infections and transient ischemic attack (TIA), and prior stroke; (2) had underlying psychotic disorders and mental disorders; (3) could not be assessed for their illness either by phone or through interview concerning the history while they are receiving treatment in a hospital and after discharge from the hospital; (4) had an in-hospital stroke; and (5) no neuroimaging was performed.

The participants were divided into 2 groups according to the length of time that stroke patients arrived at a hospital after the symptom onset. There were 97 cases in each group. All eligible subjects gave their informed consent, and the study was approved by Siriraj Institutional Review Board.

Outcomes

The assessment included the following:

(1) Baseline demographic data
(2) Modified Rankin Scale (mRS) was an assessment of level of disabilities grades 0 to 6. Minor strokes were classified as grades 0 to 1, major strokes were considered as grades 2 to 5, whereas fatalities were grade 6.
(3) The Barthel Index (BI) was used to assess the abilities to perform basic activities of daily living. The possible scores range from 0 to 100; scores from

0 to 95 were evaluated as very severe to mildly disabled, and a score equal to 100 meant physically independent self-care.
(4) The National Institutes of Health Stroke Scale (NIHSS) was used to measure the neurological deficits that the deficit levels indicated as measured by the severity of disease with 11 topics. A total of 42 scores were found by the scoring; scores from 0 to 14 mean no stroke to moderate stroke, whereas scores from 15 to 42 mean moderate or severe to severe stroke.
(5) Glasgow Coma Scale (GCS) was used to assess the level of consciousness. The scoring of the level of response to stimuli in the possible maximum score of 15; scores 3-8, 9-12 and 13-15 mean severe, moderate and mild level of consciousness change, respectively.
(6) The World Health Organization Quality of Life–Bref–Thai (WHOQOL–Bref–Thai). It consists of 4 components: physical health, psychological, social relations, and environmental domains. It includes 26 questions with possible scores of 26-130; a score of 26 to 95 indicated poor to moderate quality of life (QOL) and scores of 96 to 130 indicated good QOL.

Stroke deaths were classified because of the direct effects of the brain lesion (eg, brain herniation or respiratory failure from brainstem damage) or because of complications of disability resulting from the stroke. These included deaths from pneumonia, sepsis, and urinary tract infection, if stroke-related impairments were thought to be in some way responsible and there was no other, more likely, cause of-death. Deaths from other causes were defined as death unrelated to any stroke direct brain lesion or disability. These included cancer, AIDS, and suicide.

Patients were asked to identify stroke risk factors established by the American Heart Association, National Stroke Association and World Health Organization. Hypertension, diabetes mellitus, hypercholesterolemia, smoking, atrial fibrillation or heart disease, TIA or previous stroke, and carotid stenosis were listed as important risk factors for stroke. Then, they were asked about their recognition of the first response to a potential stroke and stroke management and prevention. These included going to a hospital as early as possible, the awareness of the availability of thrombolytic therapy, antiplatelet agents, antihypertensive agents, lipid lowering drugs, hypoglycemic agents, rehabilitation, and surgical treatment in particular cases.

The patients and caregivers were interviewed twice. The first interview was on the day one of admission and the second was at 3 months after stroke onset by a 15-minute telephone interview. The author also reviewed and filled in the data from medical records. In