Stroke Education for Multidisciplinary Medical Personnel in a Rural Area of Japan for Promotion of Hospital Visit of Acute Stroke Patients

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Background: There are few studies of stroke education suitable for multidisciplinary medical personnel. A reorganization of the management of acute stroke and stroke education for multidisciplinary medical personnel started since 2013 in our hospital located in a rural area of Japan. This study aimed to examine the effect of our stroke education on changing the number of visits of acute stroke patients to our hospital and to test the stroke knowledge of medical personnel. *Methods:* The stroke education, composed of a 20-minute lecture, was given by a stroke neurologist to 217 medical personnel (age, 49 ± 10 years; male, 70%). Posters printed with the FAST message were given to the participants at the end of the lesson: F, facial drooping; A, arm numbness or weakness; S, slurred speech or difficulty speaking or understanding; T, a time to call an ambulance. Participants completed questionnaires on stroke knowledge at baseline and 3 months after the lesson. *Results:* The number of participants who remembered correctly the FAST mnemonic at 3 months was significantly higher than at baseline (78 vs. 90%, $P = .006$). The correct answer rate for stroke symptoms other than FAST such as vision loss was approximately 50% at 3 months. The number of visits of acute stroke patients to our hospital, particularly patients with transient ischemic attack, increased significantly compared with that before the stroke education. *Conclusions:* Our stroke education method using the FAST mnemonic designed for multidisciplinary medical personnel improved their stroke knowledge. Reorganization of the management of acute stroke and greater stroke knowledge for medical staff are necessary to increase the visits of acute stroke patients in the rural areas. **Key Words:** Stroke knowledge—emergent medical service—recombinant tissue plasminogen activator—Stroke education, FAST.

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Introduction

Stroke is the leading cause of disability. Thrombolytic therapy with intravenous recombinant tissue plasminogen activator (IV-rtPA) for acute ischemic stroke is of proven benefit for good clinical outcome when administered for up to 4.5 hours after the stroke.[1] In Japan, IV-rtPA for hyperacute ischemic stroke was approved by the Ministry of Health, Labor and Welfare on October 2005. In the fourth year after its approval, 44 of 348 secondary medical service areas (13%) had never used IV-rtPA to treat acute stroke patients.[2] Until March 2013, IV-rtPA had not been used in the hospitals to treat acute stroke in Ashikita area. The Ashikita area, the secondary medical service area on the border of Kumamoto prefecture, has a low population density (approximately 120 person/km^2) and a demographic shift from 50,634 people in 2011 to 49,085 people in 2013. Since April 2013, a reorganization of management for acute ischemic stroke has started in our hospital, Minamata city general hospital and medical center, which is the only acute medical care hospital in the Ashikita area. To increase the rate of transportation of acute stroke patients to our hospital, we conducted a stroke education program for multidisciplinary medical personnel including general physicians, dentists, nurses, medical assistants, pharmacists, ambulance crews of emergency medical service (EMS), administrative officers, and medical coding specialists in this area.

In the present study, we examined the effect of our stroke education method on changing the number of emergent transportations of acute stroke patients to our hospital and on stroke knowledge of the medical personnel.

Methods

The present study was exempted from the institutional review board approval because only anonymous and untraceable data sets were used. At the beginning of June 2013, we conducted a stroke education program for a total of 217 multidisciplinary medical personnel (age, 49 ± 10 years; male, 70%) in 4 adjacent secondary medical service areas including the Ashikita area, with around 100,000 residents. The stroke education was composed of a 20-minute lecture with a slide show given by a stroke neurologist. In the lecture, we taught the participants how to recognize stroke signs and symptoms and the appropriate urgent actions to take on identifying warning signs of stroke. For simple explanation of stroke sign and symptoms and for ease of recollection, we used the FAST mnemonic derived from the Cincinnati prehospital stroke scale, where F is facial dropping, A is arm numbness or weakness, S is slurred speech or difficulty speaking or understanding, and T is a time to call an ambulance.[3-5] In addition, we talked about how to manage acute stroke patients aimed at the administration of IV-rtPA after hospital arrival and also showed several successful cases treated with IV-rtPA experienced previously in the other hospitals. At the end of the lesson, we distributed our original poster and a magnet poster printed with the FAST message, which were developed by us in National Cerebral and Cardiovascular Center (Osaka, Japan),[6] to the participants, and asked them to place the posters on the kitchen refrigerator or a wall in their room.

For the assessment of stroke knowledge, multiple-choice and closed-type questionnaires were filled out containing questions on stroke knowledge of the requirements for expert treatment (ie, best treatment option) for acute stroke, therapeutic time window for ischemic stroke, stroke signs (a total of 12 items), risk factors (10 items), and the appropriate urgent action to take on recognition of stroke warning signs. Participants filled out the questionnaires immediately after (at baseline) and 3 months after the lesson. The 12 items for stroke signs included 6 symptoms of stroke ("headache," "facial weakness," "vision loss," "speech disturbance," "numbness on one side of body," and "weakness on one side of body") and 6 atypical symptoms ("chest pain," "dyspnea," "weakness on four limbs," "abdominal pain," "edema in feet," and "joint pain"). The 10 items for risk factors consisted of 7 stroke risk factors ("alcohol intake every day," "smoking," "hypertension," "dyslipidemia," "hyperglycemia," "obesity," and "arrhythmia") and 3 atypical risk factors ("constipation," "urinary frequency," and "stiffness of neck"). All data were collected without personal identifiers.

To assess the change in the number of visits of acute stroke patients, who admitted to our hospital within 7 days of stroke onset or transient ischemic attack (TIA), we compared the total number of visits during the 4-month period (first period, from February 2013 to May 2013) before with the total number of visits during the 4-month period (second period, from June 2013 to September 2013) after receiving the stroke education. Furthermore, we also surveyed the number of acute stroke patients who admitted to our hospital in these 2 periods in 2011 and 2012, respectively.

Data obtained at baseline and 3 months after the lesson were compared between the 2 groups using the Fisher exact test. For comparing the numbers of visits to our hospital during each 2 period among 3 years (2011, 2012, 2013), incidence rate ratio was calculated using Poisson regression analysis. To calculate the incidence rate ratio, count of 0 event was corrected by .5 event. Values of P less than .05 were considered significant. Statistical analyses were performed using the JMP 8 package (SAS Institute Inc, Cary, NC).

Results

We could not collect the sheets of questionnaires from 19 participants (9%). The numbers of questionnaires