

Spreading Awareness of Stroke through School-Based Education: A Pooled Analysis of Three Community-Based Studies

Tenyu Hino, MD,* Chiaki Yokota, MD, PhD,* Kunihiro Nishimura, MD, PhD,†
 Michikazu Nakai, PhD,† Suzuka Kato, PhD,‡ Kazuyo Kuwabara, PhD,‡
 Hidehiro Takekawa, MD, PhD,§ Takuro Arimizu, MD,* Shinya Tomari, MD,*
 Shinichi Wada, MD,* Hideyuki Ohnishi, MD, PhD,|| Kazunori Toyoda, MD, PhD,*
 Tomonori Okamura, MD, PhD,‡ and Kazuo Minematsu, MD, PhD*

Background: Advancing school-based education is a promising means to spread knowledge pertaining to stroke. The aim of the current study was to clarify whether stroke lessons provided by schoolteachers could deliver stroke knowledge to children (aged 9-11 years) and their parents, at a similar level to when taught by medical staff. *Methods:* Schoolteachers conducted lessons on stroke for school children using the educational materials we prepared (i.e., the teacher group; 1051 children and 719 parents). This was compared with our previous data from Akashi city and Tochigi prefecture, in which the stroke lessons were conducted by medical staff (i.e., the medical group; 1031 children and 756 parents). Three campaigns were conducted between September 2014 and May 2016. Each child was given education materials to take home to discuss stroke with their parents. The children and their parents answered questionnaires on stroke knowledge, at baseline, immediately after the lesson, and at 3 months after the lesson. *Results:* Compared with the time point before the lesson, both children and parents instructed by the teacher group showed significant increases in the scores about stroke symptoms and risk factors, immediately and at 3 months after the lesson ($P < .001$). The combined analysis for the group instructed by medical personnel showed no significant differences in the stroke knowledge scores between the 2 groups at 3 months. *Conclusions:* Teacher-led lessons, using our educational material, adequately delivered knowledge of stroke to children and parents, in a manner that was similar to when medical staff delivered this information. **Key Words:** School children—school-based education—stroke awareness—FAST mnemonic—manga. © 2018 National Stroke Association. Published by Elsevier Inc. All rights reserved.

From the *Department of Cerebrovascular Medicine, National Cerebral and Cardiovascular Center, Suita, Osaka; †Department of Statistics and Data Analysis Center for Cerebral and Cardiovascular Disease Information, National Cerebral and Cardiovascular Center, Suita, Japan; ‡Department of Preventive Medicine and Public Health, Keio University School of Medicine, Tokyo, Japan; §Department of Neurology, Dokkyo Medical University School of Medicine, Tochigi, Japan; and ||Ohnishi Neurological Center, Department of Neurosurgery, Akashi, Japan.

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Address correspondence to Chiaki Yokota, MD, Department of Cerebrovascular Medicine, National Cerebral and Cardiovascular Center, 5-7-1 Fujishirodai, Suita, Osaka 565-8565, Japan. E-mail: cyokota@nccvc.go.jp.

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Introduction

Public awareness of the warning signs of stroke is essential to shorten the time from stroke onset to hospital arrival. Without treatment, approximately 2 million neurons and 14 billion synapses are irretrievably lost every minute during an acute stroke with large-vessel supratentorial disease.¹ Our group developed educational material to advance stroke awareness for children at junior high school and elementary school, and previously confirmed that this material helped improve the knowledge of stroke in children, which in turn was conveyed to their parents.²⁻⁷ School-based education pertaining to lifestyle-related diseases can help prevent diseases like stroke. Further, it is also expected for educated family members will act appropriately by calling emergent medical services on encountering an incidence of suspected stroke. Establishing the most effective method of dissemination will enable knowledge of stroke to be spread nationwide.

We conducted 2 campaigns in different areas, that is, the Akashi city and Tochigi prefecture, for elementary school children (aged 9-11 years).^{8,9} Emergency medical technicians instructed the children using our educational materials in Akashi city.⁸ In the Tochigi prefecture, children received lessons by physicians, nurses, or dietitians using our educational aids.⁹ Both campaigns led to the improvement of knowledge about stroke in the children, as well as in their parents.^{8,9} In these 2 campaigns, the stroke lessons were conducted by medical staff. However, we also wanted to investigate if schoolteachers could conduct stroke lessons as effectively as medical staff, so that knowledge about stroke can be widely disseminated via a school-based intervention. Our preliminary report demonstrated that, in a small sample, schoolteacher-led lessons could deliver knowledge of stroke to parents through their children, using our education materials.^{5,7}

In the present study, we conducted teacher-led study lessons, during which schoolteachers performed stroke lessons using our education materials to elementary school children (aged 10-11 years) in Suita city, Osaka prefecture. The aim of the present study was to clarify if the schoolteachers could deliver knowledge of stroke to children and their parents to a comparable level as that demonstrated by medical staff, that is, physicians, nurses, and emergency medical technicians, in our previous studies.

Method

The current study was approved by our institutional review board. No informed consent was required because of acquired departmental approval. Suita city is an urban area of Osaka prefecture, and has approximately 375,000 residents. There were 36 elementary schools in Suita. We requested the Suita City Board of Education to participate in this study. A total of 11 elementary schools agreed, and 1093 children (aged 10-11 years) and 959 parents were

included in the schoolteacher-led lesson group (i.e., the teacher group). Data for the medical staff-led lesson group (i.e., the medical group) were obtained from our previous studies that were conducted in Akashi city and Tochigi prefecture, between September 2014 and October 2015.^{8,9}

Schoolteachers in 11 elementary schools instructed children using our educational material from June 2015 to May 2016, following the same protocol as previously reported.⁶ Briefly, the schoolteacher performed a lesson using our stroke education slides for 15 minutes, then the school children viewed an animated cartoon for 10 minutes, and read a Manga (comic book) for 10 minutes. At the end of the lecture, all the children were given the Manga and a magnetic poster, both of which showed the FAST mnemonic derived from the Cincinnati prehospital stroke scale as follows: F, face numbness or weakness; A, arm numbness or weakness; S, speech slurred or difficulty speaking or understanding; and T, time to call ambulance.¹⁰ Schoolteachers asked the children to take the material home and talk about stroke with their parents. The children were also asked to put the magnet poster on the refrigerator to share with their family.

For the assessment, a multiple-choice and closed-type questionnaire on stroke knowledge was prepared as previously described.^{8,9} Briefly, the questionnaire consisted of 4 questions regarding stroke symptoms (Q1: Which symptoms do you think people with a stroke are most likely to show?), the first step that should be taken upon recognition of stroke symptoms in an individual (Q2: What do you do if you find a person who is having a stroke?), risk factors (Q3: What do you think is the likely cause of stroke?), and the meaning of the FAST mnemonic (Q4: What is the meaning of the "FAST" mnemonic?). The questions on stroke symptoms (Q1) and risk factors (Q3) were multiple-choice questions. Depending on their answer, the participants could score 0-7 points for each of these questions. Questions on calling an ambulance (Q2) and the meaning of the FAST mnemonic (Q4) were single-choice questions, and a correct answer was scored 1 point, whereas an incorrect answer was scored 0 points. The children and their parents took the same questionnaires within 2 weeks before the lesson (BL), immediately after the lesson (IL), and at 3 months post lesson (3M). A letter of request to answer questionnaires for parents was carried home by children at each time point.

All individual results were collected at each time point using an anonymous student identification number assigned to each child as previously described.⁸ In each questionnaire, we conducted mixed-model analysis using an anonymous number of children or parents and schools as random intercepts to adjust for autocorrelation of individuals using the mixed command in the STATA software. All statistical tests were 2-sided, and statistical significance was set at $P < .05$. All statistical analyses were performed using STATA software, version 13.1 (Stata Corp., College Station, TX).

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