Knowledge of Stroke Symptoms and Treatment among Community Residents in Western Urban China

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Background: Prehospital delay is still now the main barrier in receiving acute stroke therapy. Increase public awareness of stroke warning signs may help to activate emergency medical services and reduce prehospital delay. Our objectives were to survey the recognition of stroke warning signs among residents of Yuzhong District in Chongqing, China, and determine the proportion of these residents who would make an emergency call (120, in China) if suddenly faced with unexpected stroke warning signs and analyze the relationship between recognition of stroke warning signs and the response of calling for emergency assistance. *Methods:* In 2011, a population-based face-to-face interview survey using a multistage sampling method was conducted in Yuzhong District, Chongqing. We assessed residents' recognition of stroke warning signs and the proportion of those who would call the emergency number, 120, if suddenly encountering unexpected stroke warning signs. The association between the knowledge of stroke warning signs and activation of 120 was examined. *Results:* A total of 1101 participants completed the questionnaire. Only 15.6% of respondents knew all 5 stroke warning signs; 17.6% reported that they would call 120 for all 5 stroke warning signs. Recognition of stroke warning signs was associated with the response of calling 120 (odds ratios, 1.92-3.34). Even among those who knew all 5 warning signs of stroke, only 35.5% (95% confidence interval, 28.3-42.6) would call 120 for all 5 signs. *Conclusions:* Residents of the examined district in Chongqing exhibited low recognition of stroke warning signs and low awareness of appropriate emergency responses to stroke-related symptoms. **Key Words:** Stroke—emergency—warning signs—awareness.

Introduction

Stroke is the leading cause of death in China, and the mortality from stroke is much higher in China than in Western nations.[1] The early treatment of stroke is key to reducing mortality and improving prognoses among stroke victims.[2] It is well known that at the current time, the only stroke treatment with proven effectiveness is early recombinant tissue plasminogen activator (r-tPA).[3] However, the rate of thrombolysis for stroke patients is very low both in China and in other countries; in fact, less than 5% of acute ischemic stroke patients receive thrombolytic therapy.[4-6] The main reason for the poor use of r-tPA is delay in the treatment of stroke patients.[5,6] Thus, after the onset of a stroke, the only appropriate response is to immediately activate emergency medical services (EMS).[7] To activate EMS in time after a stroke, adequate knowledge of stroke warning signs, proper recognition and identification of stroke, and awareness of the need to make an emergency call are required. Only the combination of all these occurrences

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will allow EMS to be immediately activated if sudden stroke symptoms are encountered, reducing the prehospital delay for stroke patients and, thereby, increasing these patients' opportunities to receive early and effective treatment.[8,9]

Studies have found that increasing public recognition of stroke warning signs is helpful for encouraging individuals to decide to activate EMS if encountering unexpected stroke symptoms, thereby reducing prehospital delay for stroke patients.[10] However, several recent studies have demonstrated that although public recognition of stroke-related knowledge has increased over time, delays in stroke treatment remain prevalent.[11,12] The association between recognition of stroke warning signs and a decision to activate EMS is weak or nonexistent.[9,13] Currently, there is a dearth of research regarding this topic in the Chinese context. This study sought to address this deficiency by investigating recognition of stroke warning signs among residents of the Yuzhong District of Chongqing, China, determine the proportion of them who would make an emergency call (120, in China) if suddenly encountering unexpected stroke warning signs, and analyze the relationship between recognition of stroke warning signs and the response of calling for emergency assistance if encountering these signs.

Methods

Setting and Sampling

This is a cross-sectional study. According to the method of estimating the minimum sample size of qualitative data recommended by Chinese Residents of Nutrition and Health Survey in 2002, 1500 households in Yuzhong District, the center of Chongqing with a permanent population of 660,000 and 12 blocks, were randomly selected between March 20 and August 23, 2011. A multistage sampling method was adopted. First, cluster sampling was conducted to sample 3 blocks from Yuzhong District, 5 communities were randomly selected in each block, and then systematic sampling was conducted to sample 100 households in each community according to the residence number. Within each household, persons who were eligible to participate in the study must be at least 18 years, lived for more than 2 years, and had no mental disease or cognitive dysfunction that could lead to non-co-operate with the interview. Afterward, a random-number grid was used to select 1 eligible resident to be surveyed. This study was approved by the Ethics Committees of the second affiliated hospital, Chongqing Medical University.

Survey Contents

We reviewed some literature about recognition of stroke knowledge[8-10,13-21] and then developed a self-designed questionnaire. It was pretested with 50 people. The final revised questionnaire contained 3 sections: (1) Respondents' demographic details such as sex, age, ethnicity, educational level, monthly household income, and health insurance. (2) Recognition of stroke warning signs, respondents were asked to "Please judge whether the following 7 sudden symptoms are stroke symptoms": (i) sudden difficulty in speaking, understanding, or slurred speech, (ii) sudden shortness of breath, (iii) sudden blurred vision in 1 or both eyes, (iv) sudden severe headache with unknown cause, (v) sudden chest pain or heart palpitations, (vi) sudden dizziness, difficulty in walking, loss of balance or co-ordination, (vii) sudden numbness or weakness of the face and/or limb(s) on 1 side of the body. All the listed symptoms except for (ii) and (v) are stroke warning signs. Respondents answered with "Yes," "No," or "Do not know/Not sure" for each listed symptom. (3) Respondents' awareness of EMS to sudden symptoms of stroke. In particular, respondents were asked the questions of "How would you do first if someone near you exhibited the following symptom?" for each of the aforementioned 7 symptoms and "How would you do first if it was certain that someone near you had experienced a stroke?" The following responses were provided: (i) immediately take the patient to the hospital, (ii) call a doctor for advice, (iii) immediately call 120, (iv) call their family members, or (v) take medication and/or wait and observe. Respondents should select 1 response to each sudden symptom, and "immediately call 120" was regarded as the only appropriate choice.

Data Collection

The interview team made appointment with the selected household about the time and place before survey. After signing the informed consent form, the uniformly trained investigators conducted the survey through face-to-face interview with selected household member at the scheduled time and place. All the data were anonymized.

Statistical Analysis

All statistical analyses were completed using SPSS11.5 statistical software. Descriptive statistical analysis was employed to assess respondents' general characteristics, recognition of stroke warning signs, and the response strategies if encountering sudden symptoms of stroke. The chi-square test was used to analyze not only recognition of stroke warning signs associated with a decision to call 120 when encountering a specific stroke warning sign and with the demographic characteristics but also how recognition of stroke warning signs was correlated with an awareness of appropriate emergency responses. P less than .05 was regarded as statistically significant.