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Original Article

The effect and associated factors of dispatcher recognition of stroke: A retrospective observational study

Ming-Ju Hsieh ^{a,1}, Kuo-Liong Chien ^{b,1}, Jen-Tang Sun ^c,
 Sung-Chun Tang ^d, Li-Kai Tsai ^d, Wen-Chu Chiang ^a,
 Yu-Chun Chien ^e, Jiann-Shing Jeng ^{d,**},
 Matthew Huei-Ming Ma ^{a,b,*}, the Taipei EMS Stroke Collaborative
 Group

^a Department of Emergency Medicine, National Taiwan University Hospital, Taipei, Taiwan

^b Institute of Epidemiology and Preventive Medicine, National Taiwan University, Taipei, Taiwan

^c Department of Emergency Medicine, Far Eastern Memorial Hospital, New Taipei City, Taiwan

^d Stroke Center and Department of Neurology, National Taiwan University Hospital, Taipei, Taiwan

^e Taipei City Fire Department, Taiwan

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KEYWORDS

Stroke;
 Dispatch;
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Background/purpose: Details of the communication between the caller and dispatcher have not been reported previously in Taiwan. This study aimed to: (1) understand the details of the communication between the caller and dispatcher among the calls for stroke patients, (2) identify factors associated with stroke recognition by dispatchers, and (3) evaluate the association between stroke recognition by dispatchers and stroke management.

Methods: We conducted a retrospective observational study involving patients with stroke or transient ischemic stroke transported by the emergency medical service, and arriving at 9 hospitals in Taipei within 3 h of symptom onset from January 1, 2013 to February 28, 2014. Patients were excluded if tape-recording data or prehospital information were not available. Data of the enrolled patients were reviewed. We used stroke dispatch determination as the surrogate for stroke recognition by dispatchers. Multivariable logistic regression was used to identify the factors associated with stroke dispatch determination.

Results: A total of 507 patients were included. In approximately 50% of cases, callers were close family members. Ninety-one patients (17.9%) had stroke dispatch determination. After adjustment, stroke reported spontaneously, any symptom included in the Cincinnati

* Corresponding author. Department of Emergency Medicine, National Taiwan University Hospital, No. 7, Chung-Shan South Rd, Taipei 100, Taiwan. Fax: +886 2 23418395.

** Corresponding author. Department of Neurology, National Taiwan University Hospital, No. 7, Chung-Shan South Road, Taipei 100, Taiwan. E-mail addresses: jsjeng@ntu.edu.tw (J.-S. Jeng), mattma.tw@gmail.com, matthew@ntu.edu.tw (M. Huei-Ming Ma).

¹ The authors contributed equally.

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Prehospital Stroke Scale reported spontaneously, and dispatcher adherence to the protocol, were associated with stroke dispatch determination significantly. Stroke dispatch determination was associated with receiving pre-arrival notification, shorter door-to-computed tomography time, and thrombolytic therapy.

Conclusions: The dispatchers should spend more time identifying stroke patients by following the dispatch protocol. Recognition of stroke by dispatchers was associated with improved stroke care.

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Introduction

Thrombolytic therapy has been proven to be effective for ischemic stroke patients when administered within 3–4.5 h of symptom onset.^{1,2} In addition, previous studies have found that the sooner thrombolytic therapy is given, the better the functional outcome.^{3–5} The American Heart Association (AHA) suggests that the public should contact the emergency medical service (EMS) for help as soon as a suspected case of stroke is witnessed, to allow for prompt arrival to hospital for thrombolytic therapy and to expedite stroke management.⁶ The dispatcher is the first person contacted by the public when they attempt to activate the EMS system, and the decision of the dispatcher influences prehospital care of stroke patients. One study showed that patients recognized by dispatchers as having a stroke had an increased chance of receiving prehospital care with advanced life support (ALS) and hospital arrival was earlier compared to patients where stroke remained unrecognized.⁷ However, the sensitivity for stroke detection by dispatchers was far from ideal, ranging from 31% to 61%.^{8–11}

In Taiwan, there are no available studies evaluating communication between caller and dispatcher based on calls to activate EMS for stroke patients. In addition, there is no available research on the sensitivity of dispatcher identification of stroke. Furthermore, few studies in the literature have evaluated factors associated with correct recognition of stroke by dispatchers. Therefore, the aims of our study were: (1) to understand the characteristics of the communication between the caller and the dispatcher among calls regarding stroke patients, (2) to identify the factors associated with dispatcher recognition of stroke, and (3) to evaluate the association between dispatcher recognition of stroke and stroke management.

Methods

Study design and setting

This was a retrospective observational study, including stroke patients served by EMS systems. The study was approved by the institutional review board of the National Taiwan University Hospital. We conducted and reported the study in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology statement.¹²

The patients included in our study were treated in 9 hospitals in a metropolitan city in collaboration with the local EMS system. The participating hospitals receive approximately 55% of the 80,000 to 90,000 patients served by the EMS system in Taipei city annually, and provide thrombolytic therapy for stroke patients, if feasible. The EMS system is a two-tier fire-based system, consisting of 41 basic life support units and 4 ALS units. There is only one dispatch center in Taipei city. All dispatchers in the dispatch center were qualified as emergency medical technician (EMT)-intermediates after they receiving a 280-h course. Before commencing their dispatch career, they received an additional 8-h training course for dispatch.

The dispatch protocol for stroke patients is as follows. Initial investigation involves ascertaining patient details, the timing of the event, and details of the development of events. If, according to the initial investigation, the patient is suspected as having a stroke, the dispatcher asks a series of key questions, included in the stroke card of the dispatch manual to callers. The following are the key questions: (1) Does he/she respond to you? (2) Does he/she have respiratory difficulty? (3) Does he/she have facial asymmetry? (4) Does he/she move his/her hands and legs normally? (5) Can he/she say a whole sentence normally? (6) Does he/she have severe headache? A patient will be recognized as having a stroke if he/she has facial asymmetry, difficulty in moving hands and legs on one side, speech abnormality, or severe headache.

When the dispatcher recognizes a patient as having a stroke after communicating with the caller, the dispatcher will immediately dispatch the EMTs to the scene with stroke dispatch determination and, at the same time, inform them by telephone that a stroke is suspected. In view of the large demand for ambulance service, the relatively small number of ALS units, and the short transportation time in the city, there are no strict rules requesting the dispatcher to dispatch an ALS unit for patients with a suspected stroke, except when the patients are identified as having a life-threatening condition.

Inclusion and exclusion criteria

The study period was between January 1, 2013 and February 28, 2014. The inclusion criteria for the study were as follows: (1) patients aged ≥ 20 years with a discharge diagnosis of stroke or transient ischemic attack (TIA), and (2) patients who arrived at the emergency department (ED)

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