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Assessing awareness of appropriate responses to symptoms of stroke

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Abstract

Objective: The study explored (1) the level of awareness, and associates of greater awareness, of the appropriate action to take in response to stroke symptoms; and (2) actions taken in response to potential stroke symptoms; among general practice patients.

Methods: Patients attending general practice clinics in New South Wales, Australia completed a paper and pencil survey.

Results: 308 participants returned the survey. 76% indicated they would call an ambulance within 10 minutes for ‘difficulty speaking or understanding others, with blurred vision (in one eye), and face, arm or leg weakness or numbness (on one side of the body)’. Having a first degree relative with a history of stroke was significantly associated with greater awareness of the appropriate action to take in response to stroke symptoms. Of those reporting they had experienced ‘dizziness, loss of balance or an unexplained fall’ 80% did not call an ambulance at the time of experiencing this symptom.

Conclusion: There appears to be high awareness of the appropriate response to take for stroke symptoms among this sample, however this does not translate into actions when individuals experience a potential stroke symptom.

Practice Implications: Education campaigns should be targeted towards individuals without a family history of stroke.

1. Introduction

Globally, stroke is the second leading cause of death amongst high, medium and low income countries (1). Thrombolytic therapy with intravenous tissue plasminogen activator (tPA) is an effective intervention in appropriately selected acute stroke patients (2). Treatment must be given within 4.5 hours of symptom onset, with the effectiveness of treatment increased when given earlier within this time window (3). Therefore medical care needs to be sought as quickly as possible following symptom onset. Currently, of ischemic stroke patients, 7% receive tPA in Australia (4), and approximately 2% in the United States (US) (5).

1.1. Delay in seeking help from emergency services

While a number of factors may contribute to the low rate of tPA administration, major barriers include failure of the patient or family member to seek help urgently (6-9) and lack of stroke knowledge (10, 11). In Australia, 82% of stroke patients present to hospital as an emergency (4). However, only 41% arrive to hospital within 4.5 hours of stroke onset (4). In the United Kingdom (UK), only 48% of stroke patients present to hospital as an emergency, and 37% present within 3 hours of symptom onset (12).

1.2. Awareness of appropriate action for stroke symptoms

Approximately 53–80% of the public report they would call an ambulance for themselves or another in the event of a stroke (13-17). However these findings do not take into account the situation faced by someone having or witnessing a stroke (18), as the symptoms need to trigger the response rather than the diagnosis (14). Yoon et al (14) found that only 1%-20% of people would call an ambulance should they experience one stroke symptom. However as stroke patients often experience more than one symptom simultaneously (19), the conclusions to be drawn from this study are limited. Another study, conducted in the US, found

participants scored higher in identifying the appropriate response, calling 911 immediately, when presented with multiple stroke symptoms (18). However, as the study included first year medical students, results may not be generalizable to the general population.

1.3. Awareness of appropriate responses to stroke in the general practice setting

Approximately 81%-94% of individuals consult a general practitioner at least once a year (20, 21). Additionally, general practice (GP) clinics are accessed by a high proportion of older age individuals and those with pre-existing risk factors (22) and therefore contain a high proportion of people at an increased risk of stroke. Given the increased risk in this population, it is important to assess their level of awareness of the appropriate response to stroke symptoms. This study will provide important insights into the current levels of stroke awareness among general practice patients, and identify the educational needs of these at-risk individuals.

1.4. Aims

Among general practice patients, this study aimed to identify: (1) levels of awareness of the appropriate action to take if a friend or family member experienced stroke symptoms; (2) the socio-demographic factors associated with greater awareness of the appropriate action to take for stroke symptoms; and (3) the action taken by those who report having experienced a potential stroke symptom.

2. Methods

The study was conducted in two GP clinics in Lake Macquarie East, New South Wales, Australia. Practices within this locality were chosen as it contained the highest proportion of persons with a known stroke risk factor (55 years or older), and highest population density

(persons/km²) within Newcastle and Lake Macquarie Statistical Sub Division area (23). The study was approved by the Human Research Ethics Committee of the University of Newcastle.

2.1. Participants

Consecutive patients attending a participating GP clinic on selected days during October – December 2011 were invited to participate. Patients under the age of 18 years, with insufficient English, or otherwise unable to complete the survey (for example too ill or unable to read) were excluded.

2.2. Procedure

Upon arrival at the clinic a research assistant sought informed consent from eligible patients. The purpose of the survey was described as examining people's awareness of the appropriate responses to take for signs and symptoms indicating a common disease or condition, with no mention of stroke. Consenting patients completed a 10-15 minute paper and pencil survey prior to their consultation. Age and gender of consenters and non-consenters were recorded.

Participants who did not complete the survey prior to their appointment had the option of completing the survey after their appointment, at the clinic or at home. Participants who chose to take the survey home were provided with a reply paid envelope. Those who did not return the survey were sent a reminder letter 2 weeks following their appointment at the GP clinic.

2.3. Measures

2.3.1. Development of stroke symptom clusters

Participants were presented with four stroke symptom clusters (that is, a group of symptoms) developed on the basis of a literature search and descriptions from National Stroke Foundation (NSF). As patients often experience more than one symptom simultaneously, symptoms were presented as clusters (19, 24). Symptoms within each cluster were based on the four ischaemic stroke subtypes i.e. lacunar infarct, total anterior circulation infarct, partial anterior circulation infarct, and posterior circulation infarct (25, 26). Symptom clusters were reviewed by a neurologist with expertise in stroke and a nurse with cardiology experience. The survey comprised the following clusters:

1. Face, arm and leg weakness or numbness (on one side of the body).
2. Difficulty speaking or understanding others, with blurred vision (in one eye), and face, arm or leg weakness or numbness (on one side of the body).
3. Difficulty speaking or understanding others, with blurred vision (in one eye) and dizziness.
4. Blurred vision, with face, arm or leg weakness or numbness (on both sides of the body).

2.3.2. Survey items

Hypothetical symptoms: Following each symptom cluster participants were asked “If an adult friend or family member had the following symptoms what would you do?”

Response options included “Call an ambulance and describe the symptoms to the officer”, “Go to the hospital emergency department”, “Call a general practitioner (GP)” and “Wait to see if the symptoms persist, then decide”. Participants were asked to indicate the estimated time (in minutes, hours or days) they would wait before taking the action.

Self-reported experience of symptoms: Participants were presented with a list of potential stroke symptoms as described by NSF and asked, “Have you experienced this symptom within the last 12 months?” Symptoms are presented in Table 3. Participants who

indicated they had experienced a potential stroke symptom were asked “What did you do when the symptom started?” Response options included “Called an ambulance”, “Went to the emergency department”, “Called a general practitioner (GP)” and “Did not do anything”. Participants were also asked how long they waited (minutes, hours or days) before taking the action. Those who indicated they did not call an ambulance were asked the main reason for not taking this action.

Participant characteristics: Participants were asked to report whether they had any of the following risk factors: history of stroke, previous transient ischaemic attack (TIA), high blood pressure (hypertension), high cholesterol, history of heart attack, irregular pulse (atrial fibrillation), diabetes (type 1 or 2), smoking status, and first degree relative history of stroke. Participants were also asked whether other family and/or friends had a history of stroke, whether they had completed a first aid course, their perceived risk of stroke compared to another person of their age, and the extent to which they agreed/disagreed with the statement “An ambulance should be called immediately if someone has a stroke”. Age in years, gender, marital status, highest level of education completed, employment status, and country of birth were obtained. Questions on participant characteristics were completed last, thus minimising the extent that respondents were cued to the survey’s focus on stroke.

2.4. Data Analysis

Given recommendations from NSF, American Stroke Association (ASA), and the UK’s Stroke Association are to call for emergency assistance immediately for stroke symptoms, rather than attend an emergency department or GP, response options for the dependent variable (symptom response) were aggregated into 2 groups: (1) call an ambulance and describe the symptoms to the officer within 10 minutes or (2) other (all remaining response

options). Each respondent received an accumulated score 0-4 based on their endorsed action and the time given before taking the action across all stroke symptom clusters. For each symptom cluster, responses aggregated to group 1 scored 1. All remaining responses scored 0. “Greater awareness” was defined as a score of ≥ 3 as participants responded appropriately in more than 50% of the symptom clusters.

The association between participant characteristics (age, gender, country of birth, marital status, employment status, education level, completion of first aid course, perceived risk of stroke), risk factors (history of stroke, previous TIA, high blood pressure, high cholesterol, history of heart attack, irregular pulse, diabetes, smoking status, first degree relative history of stroke) and past experience with stroke symptoms, on awareness of the appropriate response to stroke symptoms were evaluated using an exploratory logistic regression analyses. All variables identified as significant at $p \leq 0.2$ were included in a multiple logistic regression analysis. Missing data were excluded. Unless otherwise specified, the denominator of all proportions reported in the manuscript represents the number of respondents to each item.

3. Results

With a sample of 308, the study could detect a difference of 15% (80% power, 5% significance level) in the proportion of those identifying the correct action to take for each symptom cluster.

Of 443 eligible patients attending GP clinics during the study period, 308 returned a survey (response rate=70%). There were no significant differences between responders and non-

responders for gender (X^2 (1, n=436) = 1.73, p=0.19), or age group (X^2 (4, n=434) = 9.44, p>0.05). Demographic characteristics and risk factors of responders are presented in Table 1.

Of respondents, 78 (29%) indicated a friend or second-degree relative had experienced a stroke. Compared to another person of the same age, 54 (20%) respondents believed their risk of stroke to be lower than others, 147 (56%) reported the same, and 64 (24%) indicated their risk to be somewhat or much higher than others. Over half (57%) of respondents indicated they had completed a first aid course. A majority (90%) of respondents agreed that “An ambulance should be called immediately if someone has a stroke”.

3.1. Awareness of appropriate response to symptom clusters

Table 2 outlines participants’ responses to the four stroke symptom clusters. 63%-83% of respondents indicated they would call an ambulance across each cluster.

Figure 1 shows the proportion of respondents identifying the appropriate action for each symptom cluster, calling an ambulance within 10 minutes of symptom onset. Across each cluster appropriate responses ranged 52%-76%. 174 (57%) responders were aware of the appropriate action to take for ≥ 3 stroke symptom clusters.

3.2. Factors associated with greater awareness of appropriate response

In the final multiple logistic regression model, having a first degree relative with a history of stroke was found to be significantly associated with a greater awareness of the appropriate action to take in response to stroke symptoms (OR 1.99, 95% CI 1.02-3.90, p=0.04).

3.3. Appropriate responses to past experiences of stroke symptoms

107 (35%) participants reported having experienced one or more potential symptoms of stroke within the last 12 months. Of those reporting they had experienced 'Dizziness, loss of balance or an unexplained fall', almost all (80%) of respondents indicated they did not call an ambulance at the time of experiencing the symptom (Table 3).

The most common reported reason for not calling an ambulance was that respondents waited to see if the symptom(s) would go away (28%) (Table 4). Of the respondents that chose 'other' (23%) the majority attributed their symptoms to another disease.

4. Discussion and Conclusion

4.1. Discussion

Results indicate that education improvements regarding appropriate responses to stroke are needed among general practice patients. 10% of respondents did not agree that an ambulance should be called immediately if someone has a stroke. This is concerning given the potential consequences of stroke. This finding is comparable to previous literature (13, 15), however is substantially lower to Yoon et al (14) who reported 46% of responders would not call an ambulance in response to a stroke. The difference in proportions of individuals recognising the need for an ambulance in response to stroke may be indicative of an increase in awareness in the last decade.

4.1.1. Awareness of appropriate response to symptom clusters

The majority of participants (63%-83%) indicated they would call an ambulance if a friend or family member were to experience a cluster of stroke symptoms (without reference to stroke). Clusters 1, face, arm and leg weakness or numbness (on one side of the body), and 2, difficulty speaking or understanding others, with blurred vision (in one eye), and face, arm or

leg weakness or numbness (on one side of the body), were more commonly recognised as requiring an emergency response. Similarly, these symptoms were most commonly recognised as stroke symptoms in Kothari et al's (9) study of acute stroke patients, and more often prompted a response of calling 911 compared to other stroke symptoms (18). Across clusters, not all participants who indicated they would call an ambulance reported that they would do so within 10 minutes (59%-80%). Therefore greater awareness of the importance of an immediate response to stroke symptoms is needed in order to increase the likelihood patients receive best practice stroke treatment.

4.1.2 Factors associated with greater awareness of appropriate response

Having a first degree relative with a history of stroke was significantly associated with a greater awareness of the appropriate action to take in response to stroke symptoms. To our knowledge no other studies have examined this relationship. Previous literature has examined the association of family history of stroke and knowledge of stroke risk factors and symptoms, with mixed findings (14, 16)(17). Our result is supported by the 20-70% of individuals reporting family members as a source of information regarding stroke in previous studies (10). Knowing someone with stroke has been associated with increased knowledge of stroke symptoms (11). This suggests stroke naïve people may be important to target in campaigns to raise awareness.

4.1.3. Appropriate responses to past experiences of stroke symptoms

35% reported having experienced at least 1 potential symptom of stroke in the past 12 months. These results are double prevalence estimates in the US in which approximately 18% of individuals over 45 years of age reported having experienced at least 1 symptom (24). The most highly reported symptoms were dizziness, loss of balance or an unexplained fall (55

respondents) and headache, severe and sudden onset or unexplained change in the pattern of headaches (47 respondents). The higher prevalence of latter symptoms may be because dizziness and headaches are commonly reported symptoms for other diseases such as migraine (26).

Across symptoms, the proportion of individuals reporting they called an ambulance in response to potential symptoms of stroke ranged 4%-50%. This is substantially higher than previous literature in which 18% of stroke patients reported they called emergency medical services at the time of experiencing their symptoms (7). Results indicate a clear discrepancy between the hypothetical actions taken in response to a cluster of symptoms and the reported action taken when a potential symptom is experienced. This highlights the need to emphasise the importance of an immediate response to stroke symptoms among the general population and those at risk of stroke.

The most common reasons for not calling an ambulance when experiencing a potential stroke symptom were ‘Waited to see if my symptom/s would go away’, and the attribution of symptoms to another disease. Similar results have previously been found in stroke and TIA patients (7, 8). This information is helpful in understanding how patients make a decision about whether to seek medical advice for a potential stroke symptom.

4.1.4. Limitations

By adopting symptom descriptions from the NSF, severity and suddenness of symptoms was not taken into account when asking participants their response to hypothetical symptoms of stroke and previously experienced symptoms, leaving this open to interpretation. To our knowledge the influence of symptom severity and suddenness in stroke has not been

examined. It would be worthwhile for future studies to examine the impact of severity and the terminology used to present stroke symptoms.

The terminology used may be an important factor affecting both individuals' awareness and behavior, as awareness has been found to be higher for symptoms described in lay compared to medical language (18). Self-reported experiences of stroke symptoms were examined as individual symptoms rather than clusters because we expected only a small proportion of participants would respond positively to each symptom cluster. This decision is supported by the small proportion of responders reporting a history of stroke or TIA (8%). This may potentially explain the discrepancy between awareness and self-reported behavior when faced with stroke symptoms.

The data may be limited in generalizability due to the large amount of missing data, potentially indicating limited comprehension of survey items. Due to the difficulties in accurately assessing diet, exercise, weight and alcohol consumption in self-reported measures, these risk factors were not measured. It is possible that these risk factors may be associated with greater knowledge of the appropriate action to take in response to stroke symptoms. In addition, the analysis conducted must be considered 'exploratory' given the large number of variables examined, and this must be taken into consideration when interpreting results of the logistic regression.

4.2. Conclusion

To our knowledge this was the first study to assess awareness of the appropriate responses to stroke symptoms, by presenting clusters of symptoms without identifying stroke as the diagnosis in question. Our results correspond with previous literature examining knowledge

of stroke symptoms and their appropriate responses. Our results indicate there appears to be a high level of awareness, among general practice patients, of the appropriate actions to take for symptoms of stroke. However, this awareness does not necessarily accord with actions taken when individuals experience stroke symptoms. Delayed or inappropriate responses to stroke represent a potentially modifiable barrier to the use of evidence-based treatment, which may produce substantial benefits for patients and therefore reduce the burden of disease for stroke.

4.3. Practice implications

Improvements in awareness of the need to call an ambulance immediately following stroke symptom onset are required. Rates the of appropriate response varied among symptoms, suggesting the need for public health campaigns to improve awareness of certain symptoms such as dizziness, loss of vision, and difficulty swallowing. These symptoms were less likely to trigger the response of calling an ambulance in our sample. Given this variation, results of our study may be used to inform and improve upon current public media campaigns for stroke such as the F.A.S.T (Face, Arm, Speech, Time) campaign launched by NSF, UK's Stroke Association, and American Heart Association (AHA) and ASA. Developing more comprehensive media campaigns may ensure all stroke symptoms are highly publicized, and therefore recognized as stroke. This should include acknowledgement among the general population that a stroke may present as a single symptom or multiple symptoms simultaneously, and emergency services should be notified regardless. Public health education campaigns should also be targeted towards individuals without a family history of stroke to increase awareness of the appropriate response, potentially increasing the number of patients receiving best-practice stroke care.

References

1. WHO. The World Health Report 2000. Health Systems: Improving Performance. Geneva, Switzerland: World Health Organisation 2000.
2. Hacke W, et al. Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke. *N Engl J Med* 2008;359:1317-29.
3. Hacke W, et al. Association of outcome with early stroke treatment: pooled analysis of ATLANTIS, ECASS, and NINDS rt-PA stroke trials. *Lancet* 2004;363:768-74.
4. National Stroke Foundation. National Stroke Audit - Acute Services Clinical Audit Report. Melbourne, Australia: National Stroke Foundation 2011.
5. Fang MC, Cutler DM, Rosen AB. Trends in thrombolytic use for ischemic stroke in the United States. *Journal of Hospital Medicine* 2010;5:406-9.
6. Kwan J, et al. A systematic review of barriers to delivery of thrombolysis for acute stroke. *Age & Ageing* 2004;33:116-21.
7. Williams LS, et al. Stroke patients' knowledge of stroke. Influence on time to presentation. *Stroke* 1997;28:912-5.
8. Barr J, et al. Patient recognition of and response to symptoms of TIA or stroke. *Neuroepidemiology* 2006;26:168-75.
9. Kothari R, et al. Patients' awareness of stroke signs, symptoms, and risk factors. *Stroke* 1997;28:1871-5.
10. Nicol MB, et al. Knowledge of risk factors and warning signs of stroke. *Vascular Health & Risk Management* 2005;1:137-47.
11. Sullivan K, Dunton NJ. Development and validation of the Stroke Knowledge Test. *Topics in Stroke Rehabilitation* 2004;11:19-28.
12. Harraf F, et al. A multicentre observational study of presentation and early assessment of acute stroke. *Bmj* 2002;325:17.

13. Carroll C, et al. Stroke in Devon: knowledge was good, but action was poor. *Journal of Neurology, Neurosurgery & Psychiatry* 2004;75:567-71.
14. Yoon SS, et al. Knowledge of stroke risk factors, warning symptoms, and treatment among an Australian urban population. *Stroke* 2001;32:1926-30.
15. Reeves MJ, et al. Knowledge of stroke risk factors and warning signs among Michigan adults. *Neurology* 2002;59:1547-52.
16. Rowe AK, Frankel MR, Sanders KA. Stroke awareness among Georgia adults: epidemiology and considerations regarding measurement. *Southern Medical Journal* 2001;94:613-8.
17. Parahoo K, et al. Stroke: awareness of the signs, symptoms and risk factors—a population-based survey. *Cerebrovascular Diseases* 2003;16:134-40.
18. Billings-Gagliardi S, Mazor KM. Development and validation of the stroke action test. *Stroke* 2005;36:1035-9.
19. Handschu R, et al. Emergency calls in acute stroke. *Stroke* 2003;34:1005-9.
20. Australian Bureau of Statistics. Patient Experiences in Australia: Summary of Findings, 2011-2012 (Cat no. 4839.0). 2012.
21. Hsiao CJ CD, Beatty PC, Rechtsteiner EA. National Ambulatory Medical Care Survey: 2007 Summary. *National Health Statistics Reports*; no 27. Hyattsville, MD: National Center for Health Statistics; 2010.
22. Britt H MG, Charles J, Henderson J, Valenti L, Harrison C, Zhang C, Chamber T, Pollack AJ, Bayram C, O'Halloran J, Pan Y. A decade of Australian general practice activity 2002–03 to 2011–12. Sydney 2012.
23. Australian Bureau of Statistics. National Regional Profile: Lake Macquarie - East (Statistical Area Level 3) 2007-2011 (Classifications Code: 11101) 2013.

24. Howard VJ, et al. High prevalence of stroke symptoms among persons without a diagnosis of stroke or transient ischemic attack in a general population: the REasons for Geographic And Racial Differences in Stroke (REGARDS) study. Arch Intern Med 2006;166:1952-8.
25. Bamford J, et al. Classification and natural history of clinically identifiable subtypes of cerebral infarction. Lancet 1991;337:1521-6.
26. Aminoff MJ KG. Nervious System Disorders. In: McPhee SL PM, Rabow MW, editor. CURRENT Medical Diagnosis & Treatment 2012. New York: McGraw-Hill; 2012.

Figure Legends

Figure 1. Responders' knowledge of calling an ambulance within 10 minutes of symptom onset for each stroke symptom cluster. Cluster 1 (n=308), cluster 2 (n=301), cluster 3 (n=294), cluster 4 (n=299).

Table 1. Demographic characteristics and risk factors.

Characteristic	n (%)
Gender (n=308)	Male 114 (37.0)
Age (n=275)	
<35 years	33 (12.0)
35-44 years	34 (12.4)
45-54 years	39 (14.2)
55-64 years	37 (13.5)
≥65 years	132 (48.0)
Highest level of education (n=258)	
Primary school	15 (5.6)
High school/Secondary	134 (50.0)
Trade qualification	77 (28.7)
University	38 (14.2)
Other	4 (1.5)
Marital status (n=238)	
Married	148 (55.0)
De-facto	16 (6.0)
Divorced	23 (8.6)
Separated	8 (3.0)
Widowed	45 (16.7)
Never Married	29 (10.8)
Employment status (n=267)	
Employed full-time	40 (15.0)
Employed part-time/casual	40 (15.0)

Unemployed	8 (3.0)
Student	5 (1.9)
Retired	128 (47.9)
Home duties	35 (13.1)
Other	11 (4.1)
<hr/>	
Country of birth (<u>n=267</u>)	
Australia	245 (91.8)
Other	22 (8.2)
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Risk Factors for Stroke (<u>n=276</u>)	
Previous stroke	6 (2.2)
Previous transient ischaemic attack (TIA)	15 (5.4)
High blood pressure (hypertension)	106 (38.4)
High cholesterol	65 (23.6)
Previous heart attack	18 (6.5)
Irregular pulse (atrial fibrillation)	39 (14.1)
Diabetes (Type 1 or 2)	44 (15.9)
Current or past smoker*	129 (46.6)
First degree relative history of stroke*	65 (24.4)

*Number of observations varies due to missing data and multi-response items.

Table 2. Knowledge of the appropriate course of action for each symptom cluster.

Endorsed Response	Cluster 1	Cluster 2	Cluster 3	Cluster 4
	<u>n=308</u>	<u>n=301</u>	<u>n=294</u>	<u>n=299</u>
	n (%)	n (%)	n (%)	n (%)
Call an ambulance	234 (76.0)	249 (82.7)	184 (62.6)	215 (71.9)
Go the hospital emergency department	34 (11.0)	32 (10.6)	63 (21.4)	46 (15.4)
Call a GP	25 (8.1)	18 (6.0)	31 (10.5)	30 (10.0)
Wait to see if symptoms persist	15 (4.9)	2 (0.7)	16 (5.4)	8 (2.7)

Number of observations varies due to missing data.

Table 3. Course of action in response to stroke symptoms experienced.

	Facial	Arm	Leg	Difficulty	Dizziness ^e	Loss of	Severe	Difficulty
<u>Symptom experienced in</u>	weakness^a	weakness^b	weakness^c	speaking^d		vision^f	headache^g	swallowing^h
<u>last 12 months</u>	<u>n=10</u>	<u>n=16</u>	<u>n=12</u>	<u>n=8</u>	<u>n=55</u>	<u>n=25</u>	<u>n=47</u>	<u>n=23</u>
Called an ambulance	1 (10.0)	2 (12.5)	2 (16.7)	4 (50.0)	2 (3.6)	1 (4.0)	6 (12.8)	2 (8.7)
<u>n (%)</u>								
Did not call ambulance	7 (70.0)	11 (68.8)	7 (58.3)	4 (50.0)	44 (80.0)	19 (76.0)	39 (83.0)	18 (78.3)
<u>n (%)</u>								
Missing response	2 (20.0)	3 (18.8)	3 (25.0)	0 (0.0)	9 (16.4)	5 (20.0)	2 (4.3)	3 (13.0)
<u>n (%)</u>								

Number of observations varies due to missing data. Denominator of 'Called an ambulance' 'Did not call ambulance' and 'Missing Response' is 'Symptom experienced'. ^aface weakness or numbness or paralysis in either or both sides; ^barm weakness or numbness or paralysis in either or both sides of the body; ^cleg weakness or numbness or paralysis in either or both sides of the body; ^ddifficulty speaking and/or understanding others; ^edizziness, loss of balance or an unexplained fall; ^floss of vision, sudden blurred or decreased vision in one or both eyes; ^gheadache, severe and sudden onset or unexplained change in the pattern of headaches; and ^hdifficulty swallowing.

Table 4. Reasons for ‘inappropriate’ response to stroke symptoms (n=107).

Reasons for inappropriate action	n (%)
Waited to see if my symptom/s would go away	30 (<u>28.0</u>)
Other	24 (<u>22.7</u>)
Symptom/s came and went	10 (<u>9.3</u>)
Did not realise the importance of my symptom/s	<u>5</u> (<u>4.7</u>)
Did not recognise my symptom/s could be related to stroke	4 (<u>3.7</u>)
Did not want to trouble anyone	3 (<u>2.8</u>)
Was embarrassed to get help	0 (<u>0.0</u>)
Feared what might happen	0 (<u>0.0</u>)
<u>Missing data</u>	<u>31</u> (<u>29.0</u>)