Stroke Awareness in the Saudi Community Living in Riyadh: Prompt Public Health Measures Must Be Implemented

Ahmed Alaqeel, MD,* AlBatool AlAmmari, MD,† Nourah AlSyefi, MD,†
Fawaz Al-Hussain, FRCPC, MPH,† and Yousef Mohammad, MD, MSc†

Background: Stroke is very prevalent in the Kingdom of Saudi Arabia, approaching 43.8 per 100,000 people. Stroke outcome is known to be affected by the level of stroke awareness in the community. We conducted this study to assess the level of stroke awareness in the Saudi population. *Methods:* A validated survey of 11 questions was used to assess the level of stroke awareness among the Saudi population. The survey was distributed in a 1-month period to every adult Saudi citizen visiting 10 shopping centers, 10 large supermarkets, 4 hospitals, and 2 universities. *Results:* Two thousand eight hundred sixty-two people completed the questionnaire (a 78% response rate). One thousand eight hundred forty-four people (64%) were able to define stroke correctly. One thousand four hundred twenty-eight people (49.9%) named mass media as the source of their knowledge. One thousand three hundred one (45.9%) believe stroke and brain death share the same pathologic mechanism and outcome, particularly those <40 years of age ($P < .05$). Six hundred twenty-two (21.7%) of the respondents correctly chose ≥5 risk factors and made ≤1 error. Five hundred twenty-seven (18.4%) of the participants in this study were able to correctly identify ≥3 symptoms of the list and make ≤1 error. *Conclusions:* There is an alarming deficit in the level of stroke awareness in the Saudi population. Urgent public health measures to correct this deficiency are promptly needed. **Key Words:** stroke awareness—saudi arabia—cross-sectional.
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Stroke is the second most common cause of death worldwide. It affects almost 200 per 100,000 people every year.[1-3] The burden on both the patient and the patient's family is tragic, and the economic costs are colossal.[4] In Arab nations, the annual stroke incidence varies between 27.5 to 63 per 100,000 people, and the prevalence is 42 and 68 per 100,000 population.[5] In Saudi Arabia, the prevalence of stroke was estimated at 43.8 per 100,000 per year in Riyadh and 40 per 100,000 in the Eastern Province, with a male to female predominance of 2.2:1.[6] These rates are low when compared to those of other developed countries and similar to the numbers of some developing countries, which thought to be related to the predominance of youth in these population.[6,7] Studies have also shown that hypertension (56%), diabetes mellitus (42%), and cardiopathy (33%) are the most common leading causes of stroke in Saudi Arabia.[7,8]

Increasing public awareness of stroke risk factors and warning signs has been widely recognized as a crucial factor influencing stroke prevention, prehospital care, and therapeutic outcomes.[9-11] Our aim was to provide an opportunity to establish an evidence-based evaluation of the level of stroke awareness among the Saudi population living in Riyadh.

Methods

Respondents

Ethical approval was obtained from the institutional review board at King Khalid University Hospital, Riyadh,

Saudi Arabia. Twenty medical students were trained to administer a standardized questionnaire to Saudi citizens >15 years of age who were randomly selected using information provided by the Saudi national census. Identification numbers were assigned to all of the shopping centers, large supermarkets (>3000 square feet), hospitals, and universities in Riyadh that were identified in the census. From these identification numbers, 10 shopping centers, 10 large supermarkets, 4 hospitals, and 2 universities were randomly chosen in which to distribute questionnaires.

Survey Setting

The present study was a cross-sectional analysis of a random sample taken from the population of Riyadh, which is the capital city of Saudi Arabia and is home to 5.8 million residents, comprising 24.1% of the country's population. Almost half (48.6%) of the Saudi Arabian population is young (≤24 years of age) and 86.6% of the population is literate.[12,13] The average income per person reaches $25,700 US per year.[13] This study was conducted during a 1-month period (October 2011). Twenty trained medical students administered the questionnaire. We used a standardized 11-item questionnaire pertaining to stroke awareness, knowledge and attitude that has been used in several studies in the United States,[11] Brazil,[14] Ireland,[15] Spain,[16] and Switzerland[17] (see Supplementary Materials available online at www.strokejournal.org). Warning signs and risk factors were asked in a list format derived from Schneider et al[11] (a US survey based on the National Stroke Association and American Stroke Association). The questionnaire was translated into Arabic and approved by 1 neurologist then tested for both comprehension and readability by 50 subjects who were not included in the study.

Definitions

In his study in Spain, Montaner et al[16] defined the knowledge of the stroke warning signs and risk factors as follows: good knowledge of stroke risk factors meant the ability to name ≥5 risk factors and make ≤1 error; a good knowledge of stroke warning signs meant the ability to recognize correctly ≥3 symptoms of the list and make ≤1 error.

Data Analysis

A descriptive comparative analysis was carried out using SPSS software (version 17; SPSS, Inc., Chicago, IL). Chi-square analysis was performed to test the association between ≥2 categorical variables. A multiple logistic regression analysis was used to identify factors independently associated with a good knowledge of stroke warning signs and risk factors. Odds ratio were generated for outcome of interest. $P < .05$ was considered the cutoff value for significance.

Results

A total of 2862 out of 3492 questionnaires were completed (a response rate of 78%). The demographic variables of the population surveyed are presented in Table 1. There were 1409 (49.2%) men and 1453 (50.8%) women. The majority of respondents (2511 [87.7%]) had heard or read about stroke, and 1428 (49.9%) of them named mass media as the main source of their knowledge. However, 1301 (45.9%) participants believed that stroke and brain death share the same pathologic mechanism and outcomes, particularly respondents <40 years of age ($P < .05$).

Participants were asked to choose what they thought was the correct definition of stroke, and >1 answer was allowed. A blockage of the blood flow to the brain by a clot was answered by 1844 (64.4%) participants; 928 (32.4%) answered that stroke is a brain hemorrhage; and 1022 (35.7%) answered that stroke is a heart disease. One in every 7 participants answered that they did not know the correct definition of stroke.

Knowledge of Stroke Risk Factors

Only a small proportion was able to identify stroke risk factors, including hypertension (957 [33.4%]), diabetes mellitus (482 [16.8%]), tobacco smoking (1065 [37.2%]), dyslipidemia (889 [31.1%]), old age (971 [33.9%]), heart disease (1161 [40.6%]), ethnicity (109 [3.8%]), obesity (718 [25.1%]), stress (306 [10.7%]), and family history (245 [8.6%]). One in every 10 respondents selected that they did not know any risk factor.

Knowledge of stroke risk factors in this study was defined as being able to name ≥5 correct risk factors and makes ≤1 error. A total of 622 (21.7%) of the respondents correctly chose ≥5 risk factors and made ≤1 error. As summarized in Table 2, multiple logistic regression analysis was used to identify factors independently associated with good knowledge, which showed a great association with age and sex. Female participants in this study showed more awareness than males ($P < .0001$); respondents aged ≤45 years of age chose more correct answers than those who were older ($P = .018$). Good knowledge however, was not associated with higher educational status ($P > .05$).

Knowledge of Stroke Warning Signs

A small proportion was able to recognize stroke symptoms and signs, including speech difficulty (1321 [46.2%]), blurred vision (1114 [38.9%]), dizziness (759 [26.5%]), numbness (534 [18.7%]), focal weakness (1303 [45.5%]), and difficulty understanding or sudden