

**AWARENESS AND KNOWLEDGE OF OUTPATIENTS IN TAIF, SAUDI ARABIA
REGARDING STROKE****Yahea Abdullah Alzahrani¹, Dr. Naif Edah Alomairi*¹, Mushari Hamed M. Althomali², Abdulaziz MUSAAD Althagafi², Abdullah Hosni M Kutbi² and Salman Abdulhafez T Alzaidi²**¹Department of Internal Medicine, College of Medicine and Medical Sciences, Taif University, Taif, Saudi Arabia.²College of Medicine and Medical Sciences, Taif University, Taif, Saudi Arabia.***Corresponding Author: Dr. Naif Edah Alomairi**

Department of Internal Medicine, College of Medicine and Medical Sciences, Taif University, Taif, Saudi Arabia.

Article Received on 03/12/2017

Article Revised on 24/12/2017

Article Accepted on 14/01/2018

ABSTRACT

Background: Among important causes of delay of stroke management and consequently poor prognosis is poor knowledge regarding stroke risk factors, symptoms and appropriate response to acute stroke. **Objectives:** To assess knowledge of stroke risk factors, symptoms, protective factors and management among patients attending outpatient clinics of tertiary hospitals in Taif, Saudi Arabia as well as to determine factors associated with knowledge. **Subjects and methods:** This was a cross-sectional study conducted at two tertiary hospitals in Taif city, Saudi Arabia. It included a simple random sample of patients attending outpatient clinics of these two hospitals during the period between 1st May-31st May, 2017. The study instrument used was a structured self-administered questionnaire, which consisted of two main sections: general characteristics of the participants (age, gender, income, education), and knowledge of stroke (symptoms, risk factors, protective factors and management including neuroimaging). **Results:** The study included 96 patients. Almost two-thirds of them (62.5%) aged between 20 and 35 years. Most of them (72.9%) were males. Less than half of the participants (44%) heard about or knew a person affected by stroke. Most of them (81.1%) knew that stroke affects the brain. The highest known risk factor for stroke was hypertension (37.5%), followed by smoking (10.4%). Regarding protective factors against stroke, the highest known factor was daily physical exercise (57.3%), followed by healthy diet (26%), hypertension control (22.9%) and cessation of smoking (11.5%). Concerning stroke symptoms, the most frequent known were slurring of speech (47.9%), sudden loss of consciousness (43.8%) and sudden face/hand/lower limb numbness (41.7%). Only 13.5% of the participants could recognize the fact that there is a role of neuroimaging (CT, MRI) in the diagnosis and management of stroke. Only 6 persons (6%) knew that the expected complications of stroke as hemorrhage can be seen by neuroimaging. The availability of endovascular treatment of stroke such as thromboectomy was recognized by only one patient (1%). The overall distribution of the percentage of total knowledge score ranged between 4 and 56% with a mean±SD of 23.96±9.4. **Conclusion:** Knowledge regarding stroke is suboptimal among outpatients in Taif city, particularly concerning role of diabetes as a risk factor, role of neuroimaging in management. Proper health education for the general public is highly needed.

KEYWORDS: Stroke, awareness, knowledge, risk factors, neuroimaging.**INTRODUCTION**

Stroke is one of the leading causes of disability and mortality.^[1] Its prevalence in KSA is more difficult to estimate accurately. However, a prevalence of 178/100,000 was reported in a community based survey from the Eastern region of KSA.^[2] Overall, the incidence and prevalence of stroke in KSA appears to be lower than the rates in the Western countries but falls within the range observed among Asian populations.^[3]

Among important causes of delay of stroke management and consequently poor prognosis is poor knowledge regarding stroke risk factors, symptoms and appropriate response to acute stroke.^[4-6] There is a gap in public

knowledge about stroke, despite acceptable awareness, in both developed countries^[7-11] and developing countries.^[12]

In most developing countries, there is no national public stroke education and awareness programs, therefore healthcare workers have become an important source for information for the public in this issue.^[13,14]

Before the development and implementation of effective health education programs about stroke risk factors, it is important to identify people at risk for a lower level of knowledge.

The objective of our study was, therefore, to assess knowledge of stroke risk factors, symptoms, protective factors and management among patients attending outpatient clinics of tertiary hospitals in Taif, Saudi Arabia as well as to determine factors associated with knowledge.

SUBJECTS AND METHODS

This was a cross-sectional study conducted at two tertiary hospitals in Taif city, Saudi Arabia (King Abdulaziz and King Faisal hospitals). It included a simple random sample of patients attending outpatient clinics of these two hospitals during the period between 1st May-31st May, 2017.

The study instrument used was a structured self-administered questionnaire,^[15] which consisted of two main sections: general characteristics of the participants

(age, gender, income, education), and knowledge of stroke (symptoms, risk factors, protective factors and management including neuroimaging).

The study was approved by the local Research and ethics committee at Al-Hada Armed Forces hospital in Taif, Saudi Arabia. All participants signed informed consent before inclusion in the study.

Data were collected, coded and analysed using SPSS software (version 22; SPSS Inc., Chicago, Illinois, USA). Since the outcome variable (percentage of knowledge score) was abnormally distributed as evidenced by a significant Shapiro-Wilk test ($p < 0.001$), non-parametric tests were utilized to compare between two groups (Mann-Whitney test) or more than two groups (Kruskal-Wallis test). P-values less than 0.05 were utilized for identifying statistical significance.

RESULTS

Table 1: General characteristics of the participants.

	Frequency	Percentage
Age (years)		
15-<20	18	18.8
20-<25	39	40.6
25-<35	21	21.9
35-45	10	10.4
>45	8	8.3
Gender		
Male	70	72.9
Female	26	27.1
Educational level		
<Secondary school	4	4.2
Secondary school	25	26.0
University/+	67	69.8
Income (SR/month)		
<1000	35	36.5
1000-<3000	17	17.7
3000-<6000	16	16.7
6000-10000	15	15.6
>10000	13	13.5
History of chronic diseases		
No	78	81.2
Yes	18	18.8
Place of seeking treatment in case of emergency		
Governmental hospital	72	75.0
Private hospital	19	19.8
Others	5	5.2

Table 2: Knowledge of the participants about important aspects of stroke.

	Frequency	Percentage
Risk factors		
Hypertension	36	37.5
Diabetes mellitus	4	4.2
Smoking	10	10.4
Protective factors		
Daily physical exercise	55	57.3
Healthy diet	25	26.0
Hypertension control	22	22.9
Diabetes control	6	6.3
Smoking cessation	11	11.5
Symptoms of stroke		
Sudden face/hand/lower limb numbness	40	41.7
Slurring of speech	46	47.9
Severe headache	34	35.4
Sudden loss of consciousness	42	43.8
Dizziness	30	31.3
Sudden loss of balance while walking	30	31.3
Sudden weakness of extremities	24	25.0

Table 3: Factors associated with percentage of stroke knowledge score.

	Percentage of knowledge score			p-value
	Median	IQR	Mean rank	
Age (years)				
15-<20	20	16-24	40.58	
20-<25	24	20-28	49.82	
25-<35	24	18-28	52.90	
35-45	18	12-25	33.15	
>45	28	24-35	67.50	0.060
Gender				
Male	24	20-28	49.96	
Female	22	16-28	44.58	0.394
Educational level				
<secondary school	26	24-40	66.0	
Secondary school	24	16-28	46.48	
University/+	24	16-28	48.21	0.415
Income (SR/month)				
<1000	24	20-28	52.20	
1000-<3000	24	20-26	47.26	
3000-<6000	16	13-27	36.25	
6000-10000	24	20-32	53.63	
>10000	24	20-28	49.31	0.358
History of chronic diseases				
No	24	20-28	49.04	
Yes	24	15-29	46.14	0.686
Place of seeking treatment in case of emergency				
Governmental hospital	24	16-28	47.94	
Private hospital	24	20-28	50.97	
Others	24	12-38	47.20	0.907

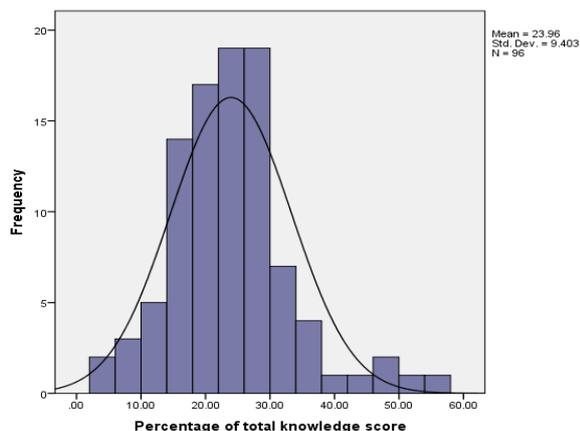


Figure 1: distribution of the percentage of the total stroke knowledge score.

The study included 96 patients. Their general characteristics are summarized in table 1. Almost two-thirds of them (62.5%) aged between 20 and 35 years. Most of them (72.9%) were males. More than two-thirds of the participants (69.8%) were university graduated or above. The income of more than one-third of them (36.5%) was below 1000 SR/month whereas that of 13.5% exceeded 10000 SR/month. History of chronic diseases was reported among 18.8% of the participants. Three-quarters of them sought governmental hospitals in case of emergency whereas 19.8% sought private hospitals.

Less than half of the participants (44%) heard about or knew a person affected by stroke. Most of them (81.1%) knew that stroke affects the brain. From table 2, it is shown that the highest known risk factor for stroke was hypertension (37.5%), followed by smoking (10.4%). Regarding protective factors against stroke, the highest known factor was daily physical exercise (57.3%), followed by healthy diet (26%), hypertension control (22.9%) and cessation of smoking (11.5%). Concerning stroke symptoms, the most frequent known were slurring of speech (47.9%), sudden loss of consciousness (43.8%) and sudden face/hand/lower limb numbness (41.7%).

Only 18.3% and 22.3% of the participants knew that there is an interval of time during which stroke patients can be treated and there is a treatment for acute stroke attacks, respectively. More than half of the participants (59.8%) knew that Aspirin is the drug used to decrease the percentage of cerebral stroke whereas 25.7% of them knew the drug used in treatment of stroke (Heparin).

In addition, only 13.5% of the participants could recognize the fact that there is a role of neuroimaging (CT, MRI) in the diagnosis and management of stroke. Only 6 persons (6%) knew that the expected complications of stroke as hemorrhage can be seen by neuroimaging. The availability of endovascular treatment of stroke such as thromboectomy was recognized by only one patient (1%).

The overall distribution of the percentage of total knowledge score was presented in figure 1. It ranged between 4 and 56% with a mean \pm SD of 23.96 ± 9.4 .

The highest level of knowledge about stroke was observed among participants aged over 45 years (mean rank was 67.5) whereas the lowest was reported among those aged between 35 and 45 years (mean rank was 33.15). However, the difference was not statistically significant, $p=0.060$. Other studied factors were not significantly associated knowledge regarding stroke as shown in table 3.

DISCUSSION

Up to our knowledge, no study evaluated the awareness and knowledge of the general public regarding stroke in Saudi Arabia, despite its great role in morbidity and mortality. Therefore, we intended to implement this study to explore the awareness and knowledge regarding different aspects of stroke among a sample of patients attending out-patient clinics of two main tertiary hospitals in Taif city, Saudi Arabia.

In the present study, 44% of patients heard about or knew a person affected by stroke. This figure is lower than that reported in other study carried out among workers in Cairo university hospitals (91.3%).^[12] However, most of them (81.1%) in the present study knew that stroke affects the brain.

The most frequently known risk factors for stroke in this study was hypertension (37.5%), followed by smoking (10.4%). In a study carried out in Cairo,^[12] the most frequently recognized risk factors were hypertension (66.3%), stress (47.8%), and smoking (43.5%). However, in agreement with finding of that study, diabetes mellitus was recognized by minority of the participants as a risk factor for stroke. In another study carried out in Egypt,^[15] hypertension, stress, obesity and smoking were the most frequently known risk factors for stroke and also diabetes was known less frequently. Also another study carried out in Nigeria^[16] reported that the most frequently known risk factor for stroke was hypertension and diabetes was less frequently reported. In Germany,^[17] hypertension, followed by smoking and obesity were the most frequently known risk factors for stroke. However, in aforementioned studies, diabetes was reported more frequently compared to our study, despite that fact of high prevalence of diabetes in our society. Also, other studies reported that Diabetes mellitus is generally insufficiently known as a risk factor for stroke by general public.^[17-19]

Regarding stroke symptoms, the most frequent known in the current study were slurring of speech (47.9%), sudden loss of consciousness (43.8%) and sudden face/hand/lower limb numbness (41.7%). Our findings agrees with findings of other studies.^[15,20] However, in a study carried out in Egypt,^[12] the most frequently known signs and symptoms of stroke were slurring of speech

(38.5%) and hypertension (38.5%). This suboptimal knowledge regarding stroke symptoms was also reported in USA^[21] and Italy.^[22]

It had been documented that the early re-opening of the occluded artery leads to better prognosis in patients with acute ischemic stroke through intravenous administration of thrombolytic agents.^[23] Unfortunately, only 1% of the participants in this study could recognize the availability of endovascular treatment of stroke such as thromboectomy.

One of the most essential elements in the early assessment of acute ischemic stroke patients is imaging with a combination of CT and MRI.²⁴⁻²⁶ Despite of this fact, only 13.5% of the participants in the present survey could recognize the fact that there is a role of neuroimaging (CT, MRI) in the diagnosis and management of stroke.

In the current study, only 6% of the participants knew that the expected complications of stroke as hemorrhage can be seen by neuroimaging. Civetta *et al*^[27] reported that a non-contrast head CT may exclude intracerebral hemorrhage.

In the current study there were no significant differences according to demographic characteristics between the participants regarding different aspects of stroke, The same has been reported in a study carried out in Egypt.¹²

In conclusion, Knowledge regarding stroke is suboptimal among outpatients in Taif city, particularly concerning role of diabetes as a risk factor, role of neuroimaging in management. Proper health education for the general public is highly needed.

The most important limitation of this study is the relatively small sample size. Also, the cross-sectional study design is another limitation which proves only association and not causality. Despite of those limitations, the study carries an important public health significance in exploring this significant issue in our community.

REFERENCES

1. Feigin VL, Lawes CM, Bennett DA, Anderson CS. Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century. *Lancet Neurol*, 2003; 2: 43–53.
2. Awada A. Primary and secondary prevention of ischemic stroke. *J Med Liban*, 2011; 59(4): 213-9.
3. Ayoola AE, Banzal SS, Elamin AK, Gadour MO, Elsammani EW, Al-Hazmi MH. Profile of stroke in Gizan, Kingdom of Saudi Arabia. *Neurosciences*, 2003; 8(4): 229-232.
4. Gupta A, Thomas P. General perception of stroke. Knowledge of stroke is lacking. *BMJ*, 2002; 325-392.
5. California Acute Stroke Pilot Registry (CASPR) Investigators. Prioritizing interventions to improve rates of thrombolysis for ischemic stroke. *Neurology*, 2005; 64: 654–659.
6. Deng YZ, Reeves MJ, Jacobs BS, Birbeck GL, Kothari RU, Hickenbottom SL, et al. IV tissue plasminogen activator use in acute stroke: experience from a statewide registry. *Neurology*, 2006; 66: 306-312.
7. Pancioli AM, Broderick J, Kothari R, Brott T, Tuchfarber A, Miller R, et al. Public perception of stroke warning signs and knowledge of potential risk factors. *JAMA*, 1998; 279: 1288–1292.
8. Reeves MJ, Rafferty AP, Aranha AA, Theisen V. Changes in knowledge of stroke risk factors and warning signs among Michigan adults. *Cerebrovasc Dis*, 2008; 25: 385-391.
9. Sug Yoon S, Heller RF, Levi C, Wiggers J, Fitzgerald PE. Knowledge of stroke risk factors, warning symptoms, and treatment among an Australian urban population. *Stroke*, 2001; 32: 1926–1930.
10. Derex L, Adeleine P, Nighoghossian N, Honnorat J, Trouillas P. Knowledge about stroke in patients admitted in a French Stroke Unit. *Rev Neurol (Paris)*, 2004; 160: 331-337.
11. Carroll C, Hobart J, Fox C, Teare L, Gibson J. Stroke in Devon: knowledge was good, but action was poor. *J Neurol Neurosurg Psychiatry*, 2004; 75: 567–571.
12. Shehata HS, Ahmed SM, Abdelalim AM, El Sherbiny N. Knowledge and attitude towards stroke among workers in Cairo University Hospitals. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, 2016; 53(1): 54-59
13. Kamran S, Bener AB, Deleu D, Khoja W, Jumma M, Al Shubali A, et al. The level of awareness of stroke risk factors and symptoms in the Gulf Cooperation Council countries: Gulf Cooperation Council stroke awareness study. *Neuroepidemiology*, 2007; 29: 235–242.
14. Schneider AT, Pancioli AM, Khoury JC, Rademacher E, Tuchfarber A, Miller R, et al. Trends in community knowledge of the warning signs and risk factors for stroke. *JAMA*, 2003; 289: 343–346.
15. Hamdy H, Abdel-Monem A, Emarat T, Moustafa R, Abdel Bar A, Abuzeid S, et al. Knowledge and attitudes towards stroke among workers in two university hospitals. *Egypt J Neurol Psychiatry Neurosurg*, 2013; 50: 49–54.
16. Akinyemi RO, Ogah OS, Ogundipe RF, Oyesola OA, Oyadoke AA, Ogunlana MO, et al. Knowledge and perception of stroke amongst hospital workers in an African community. *Eur J Neurol*, 2009; 16: 998–1003
17. Müller-Nordhorn J, Nolte CH, Rosnagel K, Jungehülsing GJ, Reich A, Roll S, et al. Knowledge about risk factors for stroke: a population based survey with 28,090 participants. *Stroke*, 2006; 37: 946-950

18. Baldereschi M, Di Carlo A, Vaccaro C, Polizzi B, Inzitari D, Promotion Implementation of Stroke Care in Italy Project Working Group. Stroke knowledge in Italy. *Neurol Sci*, 2015; 36: 415–421.
19. Kraywinkel K, Heidrich J, Heuschmann PU, Wagner M, Berger K. Stroke risk perception among participants of a stroke awareness campaign. *BMC Public Health*, 2007; 7: 39.
20. El Sherbiny N, Abdel Ghaffar H, El-Mously S. Awareness of stroke in adults and pediatrics among Fayoum University Hospital workers and medical students. *Egypt J Neurol Psychiatry Neurosurg*, 2011; 48: 235–240.
21. Pancioli AM, Broderick J, Kothari R, Brott T, Tuchfarber A, Miller R, et al. Public perception of stroke warning signs and knowledge of potential risk factors. *JAMA*, 1998; 279: 1288–1292.
22. Baldereschi M, Di Carlo A, Vaccaro C, Polizzi B, Inzitari D, Promotion Implementation of Stroke Care in Italy Project Working Group. Stroke knowledge in Italy. *Neurol Sci*, 2015; 36: 415–421.
23. Singh P, Kaur R, Kaur A. Endovascular treatment of acute ischemic stroke. *J Neurosci Rural Pract*, 2013; 4(3): 298–303.
24. Birenbaum D, Bancroft LW, Felsberg GJ. Imaging in acute stroke. *West J Emerg Med*, 2011; 12(1): 67–76.
25. Srinivasan A, Goyal M, Al Azri F, Lum C. State-of-the-art imaging of acute stroke. *Radio Graphics*, 2006; 26: S75-S95
26. American College of Radiology. Reston, VA: ACR Appropriateness Criteria “Cerebrovascular, 2009. Disease” www.acr.org/ac.
27. Civetta, Kirby, Taylor, et al. 4th Edition. Lippencott: Williams and Wilkins; Critical Care, 2009; 368–382.