Awareness of the General Population about the Risk Factors of Cerebrovascular Stroke in Arar, Saudi Arabia

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Abstract

Background: Stroke is the most common life-threatening disease and is the major cause of morbidity and mortality worldwide. Immediate patient transfer to the hospital and risk prevention rely on public awareness of warning signs and risk factors for stroke **Objectives**: To determine the public awareness regarding the risk factors, warning symptoms, and prompt management of cerebrovascular stroke in Arar, Saudi Arabia. **Methods**: A cross-sectional study conducted in Arar, Northern Saudi Arabia from the period of June 1st to August 30th, 2020 among the general population. Data was collected by using an online self-administered pre-designed questionnaire distributed via social media network. Sociodemographic and awareness data was obtained. The collected data was entered and analyzed using the SPSS program, version 23. We used the Chi-square as a test of significance. P-value considered significant if < 0.05. **Results**: Most (83.9%) of the participants have heard about stroke before, 6.9% had a family history of stroke, 49.2% defined stroke correctly, 66.4% said that stroke could affect any age group, 70.8% defined high blood pressure as a risk factor of stroke, 40.5% had previous stroke, 35.3% had coronary insufficiency, 28.9% had high blood fats, 27.8% were smoking cigarettes, 22.1% had lack of physical activity and 17.1% had diabetes. Symptoms knowledge was reported as 28.2% feeling of general weakness, 53.7% inability to move a limb, 29.7% numbness in one limb, 30.5% headache, 25.9% dizziness, 35.7% difficulty in seeing and 37.9% difficulty in speaking. On the other hand, 93.1% of our studied population would go directly to hospital if someone of their family felt the symptoms of stroke, 0.3% would go to the pharmacy, and 0.6% would wait for symptoms to go away. Regarding participants knowledge about stroke treatment, 79.2% knew there's medicinal treatment for stroke case, 6.4% indicated treatment by improving the diet and 14.2% reported doing sports. Only 37.1% knew that a stroke patient should receive treatment within 4 hours of the onset of symptoms. **Conclusion**: The general population of Arar, KSA have a reasonable knowledge about stroke. There was a significant relation between correct knowledge about stroke and educational level, working status with non-significant relation with age, gender or marital status.

Keywords: Cerebrovascular stroke, Awareness, General population, Risk factors, Arar, Saudi Arabia

INTRODUCTION

Cerebrovascular stroke is the acute onset of focal neurological findings in a vascular territory as a result of underlying cerebrovascular disease, causing compromising of the cerebral perfusion or vasculature [1]. There are two types of strokes. The more common type is ischemic strokes, caused by interruption of blood flow to a certain area of the brain. Ischemic stroke is the cause of 85% of all acute strokes [2]. The remaining 15% are the worse in prognosis hemorrhagic strokes, which are the result of bursting a blood vessel i.e. acute hemorrhage [3].

Stroke is a major global health challenge, with increasing numbers of deaths and stroke-related disability in recent decades [4, 5]. Stroke is the 2nd main cause of death and the first leading cause of disability. In 2016, There were 13.7 million new stroke cases with stroke being the second massive cause of death in the world (5.5 million deaths) after ischemic heart disease [6].

Hypertension, diabetes, smoking, obesity, atrial fibrillation, hypercholesterolemia, physical inactivity, older age, and drug use can predispose to ischemic strokes [7]. Cerebral emboli commonly originate from the heart in patients with atrial fibrillation, valvular disease, atrial and ventricular septal defects, or chronic rheumatic heart disease [8]. In addition, alcoholism is a risk factor as the risk of stroke onset is

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transiently raised in the hour following alcohol consumption [9]. The main cause of hemorrhagic strokes is uncontrolled hypertension [10].

Typically, a stroke presents with sudden weakness, numbness with signs of paralysis usually affecting one side of the body, making it hard or impossible to move an arm or leg. Fascial weakness, speech problems, trouble in seeing, dizziness, severe headache, nausea, and vomiting are also possible symptoms [11]. Immediate injection of Alteplase (intravenous tissue plasminogen activator, IV rtPA) within 4.5 hours of stroke onset is the standard of care [12].

Due to time restrictions, a stroke patient must arrive at the hospital without delay. Delayed arrival may be due to a lack of patients and public awareness of stroke symptoms [13]. If people know stroke, including its warning symptoms, proper action at the time of occurrence, and the general requirement for immediate treatment, the primary measure in improving stroke prognosis is taken. Higher awareness of stroke in patients or bystanders is associated with faster access to emergency treatment [14].

Objective:

The present study aimed to determine the public awareness regarding the risk factors, warning symptoms, and prompt management of cerebrovascular stroke in Arar, Northern Saudi Arabia.

METHODS:

A cross-sectional study was conducted in Arar, Northern Saudi Arabia from the period of June 1st to August 30th, 2020 among the general population. The sample size was calculated by using the sample size equation through the following formula (N=(Zα)2 × ([p(1-p)]/d2) Where: N= estimated sample size. Zα at 5% level of significance = 1.96, d = level of precision and is estimated to be 0.05. P = High awareness levels in two previous studies (30%). Actual sample size = (Primary sample size × design effect (estimated to be 1.5) considering the target population more than 420, and study power of 95%.

Data was collected by using an online self-administered pre-designed questionnaire distributed via social media network. Sociodemographic and awareness data were obtained.

The questionnaire included questions about sociodemographic characters of participants such as (age, marital status, educational level, working status, smoking status), questions about the awareness of cerebrovascular stroke such as (hearing of cerebrovascular stroke, risk factors of stroke, warning symptoms of stroke), and questions about the history of stroke (personal or family history of stroke).

A pilot study was conducted on 20 respondents before the beginning of the study period to determine the applicability

and adequacy of the questionnaire and further additional modifications were done after testing.

Data Management and Statistical Analysis:

The collected data was entered and analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA) version 23. Descriptive statistics were performed for qualitative variables. We used the Chi-square as a test of significance. P-value considered significant if P < 0.05.

Ethical Consideration:

Ethical approval to conduct the study was obtained from the research ethics committee of Northern Border University. The questionnaire contained a brief introduction to explain the aim of the study to the participants. Participants were informed that participating in them is completely optional. The filled out questionnaires were anonymous and kept safe.

RESULTS

Table (1) illustrates the sociodemographic characteristics and smoking history of the studied population. Our study included 709 respondents, about a third (35.3%) of them aged 31 – 40 years, and 28.8% were more than 40 years old. Females constituted two-thirds (66.6%) of the participants, 69.0% were married, 77.1% had university or higher education, 58.4% were working, 12.5% were smokers and only 2.8% were X- smokers.

Table (2): General knowledge of participants about stroke. Most (83.9%) of the participants had heard about stroke before, 6.9% of participants experienced one of their families stroke before, 49.2% defined stroke correctly and 66.4% said that stroke could affect any age group. Regarding knowledge of risk factors that may lead to stroke; 70.8% defined high blood pressure as a risk factor, 40.5% previous stroke, 35.3% coronary insufficiency, 28.9% high blood fats, 27.8% smoking, 22.1% lack of physical activity, and 17.1% diabetes.

Table (3) illustrates the participants' knowledge about stroke symptoms and its risk factors. Symptoms knowledge was reported as 28.2% feeling of general weakness, 53.7% inability to move a limb, 29.7% numbness in one limb, 30.5% headache, 25.9% dizziness, 35.7% difficulty in seeing, and 37.9% difficulty in speaking. 93.1% of our studied population would go directly to the hospital if someone of their family felt the symptoms of stroke, 0.3% would go to the pharmacy, and 0.6% would wait for symptoms to go away. On the other hand, 93.1% of our studied population would go directly to the hospital if someone of their family felt the symptoms of stroke, 0.3% would go to the pharmacy, and 0.6% would wait for symptoms to go away.

Regarding participants' knowledge about stroke treatment, 79.2% knew there was medicinal treatment for stroke case,

6.4% indicated treatment by improving the diet and 14.2% reported doing sports. Only 37.1% knew that a stroke patient should receive treatment within 4 hours of the onset of symptoms. (Table 4)

In our study, there was a significant correlation between correct answers about stroke with educational level, working status, and hearing of stroke (p<0.05) with no correlation with age, gender, and marital status. (Table 5)

Table 1: Sociodemographic Characteristics and Smoking History of the Studied Population (N=706)

	Frequency (No.)	Percent (%)
Age:		
Less than 20	61	8.6
21 – 30	193	27.3
31 – 40	249	35.3
More than 40	203	28.8
Gender:		
Male	236	33.4
Female	470	66.6
Social Status:		
Single	191	27.0
Married	487	69.0
Divorced	19	2.7
Widower	9	1.3
Educational Level:		
Illiterate	3	.4
Primary	13	1.8
Intermediate	18	2.5
Secondary	128	18.1
University or Higher	544	77.1
Working Status:		
Work	412	58.4
No Work	294	41.6
Smoking:		
Yes	88	12.5
No	598	84.7
Former Smoker	20	2.8

Table 2: General Knowledge of Participants about Stroke (N=706)

Variables	Frequency (No.)	Percent (%)
Have you ever heard of a stroke?		
Yes	592	83.9
No	114	16.1
Have you or any of your family members ever had a stroke?		
Yes	49	6.9
No	657	93.1
According to your knowledge, what is a stroke?		
A blood vessel blockage or bleeding in a specific area of the brain	347	49.2
Change in the electrophysiology of the nerves	2	.3
The brain stopped working	249	35.3
I don't know	108	15.3
As far as you know, does a stroke always cause death?		
Yes	276	39.1
No	247	35.0
I don't know	183	25.9
According to your knowledge, can stroke affect any age group?		
Yes	469	66.4
No	79	11.2
I don't know	158	22.4
According to your knowledge, does stroke affect the elderly more than the young?		
Yes	509	72.1
No	47	6.7
I don't know	150	21.2
What would you do if you or someone in your family felt symptoms of a stroke?		
Contact the pharmacy	2	.3
Wait for the symptoms to go away on their own	4	.6
Immediately go to the hospital	657	93.1
I don't know	43	6.0
Have you ever heard of TPA or Alteplase?		
Yes	31	4.4
No	675	95.6

Table 3: Participants Knowledge about Stroke Symptoms and its Risk Factors (N=706)

	Frequency	Percent
What are the factors that may lead to a stroke?		
Chronic high blood pressure	500	70.8
Diabetes	121	17.1
Coronary insufficiency	249	35.3
High blood fats	204	28.9
Obesity	156	22.1
Smoking	196	27.8
Lack of physical activity	156	22.1
Previous stroke	286	40.5
I don't know	136	19.3
According to your knowledge, what are the symptoms that indicate a stroke?		
A feeling of general weakness	199	28.2

Inability to move a limb	379	53.7
Numbness in one limb	210	29.7
Headache	215	30.5
Dizziness	183	25.9
Difficulty in vision	252	35.7
Difficulty in speaking	268	37.9
Difficulty in swallowing	120	17.1
Pee reflex	34	4.8
Rewind	59	8.4

Table 4: Participants Knowledge about Stroke Treatment (N=706)

	Frequency	Percent
What do you know about stroke treatment?		
Herbal remedy	2	.2
Medicinal treatment	559	79.2
By improving the diet	45	6.4
By muscular exercise	100	14.2
Do you know that a stroke patient should receive treatment within 4 hours of the onset of symptoms?		
Yes	262	37.1
No	444	62.9

Table 5: Correct Answers of the Participants in Half of the Questions and Sociodemographic Characteristics and Smoking History. (N=709)

Characteristics	Responses	Correct answers in half the questions or less	The correct answer in more than half the questions	Total (N=709)	P-value
Age:	Less than 20	32 / 8.6%	29 / 8.6%	61 / 8.6%	0.124
	21 – 30	111 / 30.0%	82 / 24.4%	193 / 27.3%	
	31 – 40	134 / 36.2%	115 / 34.2%	249 / 35.3%	
	More than 40	93 / 25.1%	110 / 32.7%	203 / 28.8%	
Gender:	Male	122 / 33.0%	114 / 33.9%	236 / 33.4%	0.788
	Male	248	222	470	
Social Status:	Single	101 / 67.0% 27.3%	90 / 66.1% 26.8%	191 / 66.6% 27.0%	0.724
	Married	253 / 68.4%	234 / 69.6%	487 / 69.0%	
	Divorced	12 / 3.2%	7 / 2.1%	19 / 2.7%	
	Widower	4 / 1.1%	5 / 1.5%	9 / 1.3%	
Educational Level:	uneducated	0 / 0.0%	3 / 0.9%	3 / 0.4%	0.002
	primary	11 / 3.0%	2 / 0.6%	13 / 1.8%	
	Intermediate	15 / 4.1%	3 / 0.9%	18 / 2.5%	
	Secondary	69 / 18.6%	59 / 17.6%	128 / 18.1%	
	University or more	275 / 74.3%	269 / 80.1%	544 / 77.1%	
Working Status:	Work	200 / 54.1%	212 / 63.1%	412 / 58.4%	0.026
	No Work	170 / 45.9%	124 / 36.9%	294 / 41.6%	
Smoking:	Yes	41 / 11.1%	47 / 14.0%	88 / 12.5%	0.499
	No	318 / 85.9%	280 / 83.3%	598 / 84.7%	
	A former smoker	11 / 3.0%	9 / 2.7%	20 / 2.8%	
Ever Heard about a Stroke	Yes	287 / 77.6%	305 / 90.8%	592 / 83.9%	0.001
	No	83 / 22.4%	31 / 9.2%	114 / 16.1%	

DISCUSSION:

Stroke is the most common, life-threatening disease, and is the major cause of morbidity and mortality worldwide [3]. Lowering the time between stroke and hospital admission and increased monitoring of stroke risk factors present the best

potential for successful stroke and prevention, respectively. Quick patient presentation to the hospital and risk prevention rely on public awareness of warning signs and risk factors for stroke [15]. In this study, we aim to determine the public awareness regarding the risk factors, warning symptoms, and prompt management of cerebrovascular stroke in Arar, Saudi Arabia.

In our study, 83.9% have heard about stroke before, 6.9% of participants or one of their families experienced a stroke before, 49.2% defined stroke correctly and 66.4% said that stroke could affect any age group. The results of the previous study indicated that respondents appeared to have a high knowledge level about the risk factors of stroke but their recognition of the warning signs was poor [16]. Another study reported that (29.0%) of the studied sample were familiar with the term 'stroke', and 29.3% considered the age group 30–50 at the highest risk for stroke [17]. Another study to show a difference in knowledge level among people from the rural and urban areas found that urban and semi-urban areas mentioned > 3 risk factors and warning signs compared to the urban area [18]. Another study reported that even though 95% of the respondents reported some prior information about stroke, only 37% had adequate knowledge based on pre-specified criteria [19].

Regarding knowledge of risk factors that may lead to stroke, 70.8% defined high blood pressure as a risk factor, 40.5% the previous stroke, 35.3% the coronary insufficiency, 28.9% the high blood fats, 27.8% the smoking, 22.1% lack of physical activity, and 17.1% diabetes. This was comparable to results identified by respondents in another study as hypertension (88.8%) and smoking (87.8%) [20]. This was higher than the commonest risk factors identified in another study as hypertension (23.1%) and smoking (27.3%). In another study, 69% of respondents were able to identify stroke main risk factors and only 29% knew about transient ischemic attacks [19]. Agreeing with other studies which reported the most commonly identified risk factor was hypertension (34.5%) [21]. This was almost the same as a study that reported the most commonly recognized risk factors were hypertension (35%), dyslipidemia (28.6%), and diabetes (22.9%) and nearly one-third of patients (31.4%) could not name any risk factors for stroke [15].

According to our results, symptoms knowledge was reported as 28.2% feeling of general weakness, 53.7% inability to move a limb, 29.7% numbness in one limb, 30.5% headache, 25.9% dizziness, 35.7% difficulty in seeing, and 37.9% difficulty in speaking. Another study reported sudden unilateral limb weakness, sudden speech and language disturbances, and abrupt vertigo and clumsiness were better recognized than other warning symptoms of stroke [22]. Higher results of knowledge in a study reported the most common warning signs of stroke as abdominal pain (96.1%) and chest pain (88.7%) [20]. In line with our results, a study found that the most frequently identified stroke symptoms were weakness (23%) and speech problems (21.7%) [17].

Paralysis and hemiplegia (34.4%) were the most common identified stroke symptoms [21]. The most commonly diagnosed warning symptoms in another sample were sudden unilateral weakness (61.4%), sudden trouble with speaking (25.7%), and sudden trouble with walking, loss of balance, or dizziness (21.4%) while 13.6% could not identify any warning signs [15].

The results of the present study indicated that 93.1% of our studied population would go directly to the hospital if someone of their family felt the symptoms of stroke, 0.3% would go to the pharmacy, and 0.6% would wait for symptoms to go away. In another study; approximately half of the participants would not contact the ambulance service in the case of a suspected stroke but instead would make initial contact with their general practitioner (41.5%) or family/relatives (2.3%) [16]. Another study found that 1 in 5 participants would do something other than calling for an ambulance if they thought someone was having a stroke [23]. 63% knew the existence of a time-dependent treatment in another survey, 25% would call an ambulance, and 50% would go to an emergency room by their means [19].

Regarding participants' knowledge about stroke treatment, 79.2% knew there's the medicinal treatment for stroke case, 6.4% indicated treatment by improving the diet, and 14.2% reported doing sports. Only 37.1% knew that a stroke patient should receive treatment within 4 hours of the onset of symptoms. As reported in another study, most respondents realized that effective treatment was available, that stroke was preventable and that it could be fatal or disabling [22]. Another study found that 89.3% agreed that controlling blood pressure could prevent stroke, 7.8% did not know and 2.9% answered that it could not prevent stroke [20].

In our study, there was a significant correlation between correct answers about stroke with educational level, working status, and hearing of stroke (p<0.05) with no correlation with age, gender, and marital status. This was in line with a study that reported no significant correlations between gender and living region and significant positive correlations between education and income with knowledge about stroke signs [20]. These results disagreed with the reported results of a study that found that younger age (p < 0.001), a higher level of education (p < 0.001), and female gender (p = 0.008) better-predicted stroke recognition [17]. Higher education was significantly associated with better knowledge of symptoms, and age ≥65 years, fair/poor self-rated health, history of obesity, and known diabetes were significantly associated with less knowledge of stroke symptoms [24]. Another study found that age, education level, occupation, self-reported risk factors of stroke, overweight, and obesity were associated with at least one correct response to the questionnaire about stroke risk factors or symptoms [21].

CONCLUSION AND RECOMMENDATIONS:

The general population of Arar, KSA has reasonable knowledge about stroke. There was a significant relationship

between correct knowledge about stroke and education level, working status with non-significant relation with age, gender, or marital status. We recommend health education of the public about stroke, risk factors, and the importance of immediate hospital management. We also recommend further research including the general population of all Saudi Arabia, to assess the awareness about this dangerous health problem.

Conflict of Interest:

The authors declared no conflicts with any institutions or individuals.

Budget

This study will be self-funded.

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