Section: General Medicine

Original Research Article

ASSESSMENT OF STROKE- RELATED KNOWLEDGE AND RESPONSE TO STROKE AMONG PATIENTS VISITING TERTIARY CARE HOSPITAL- AN OBSERVATIONAL STUDY

Deepthi Vemuri[1], Jyothsna Pavani Gedda[2], Vijaya Bhaskara Rao Janapareddi[3]

[1]Department of General Medicine, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Rushikonda, Visakhapatnam-530045, Andhra Pradesh, India

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Corresponding Author:
Dr. Deepthi Vemuri,
Department of General Medicine, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Rushikonda, Visakhapatnam, Andhra Pradesh, India.
Email: dvemuri@gitam.edu

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ABSTRACT

Stroke is a serious neurological noncommunicable illness that is the third leading cause of death and a substantial source of adult disability worldwide. The present study is aimed to assess the level of knowledge about stroke among general patients attending tertiary care hospital including awareness of stroke risk factors, symptoms, preventive measures and importance of seeking immediate medical attention after experiencing stroke symptoms. The study was conducted for a period of five months from May 2025 to Oct 2025. It is an observational cross-sectional study conducted in general and outpatient departments of tertiary care hospital regarding awareness of stroke risk factors, warning signs and response to stroke. The total sample size was 375. Out of 375 study participants, 190 (50.7%) were males and 185 (49.3%) were females. The known risk factors which cause stroke, Hypertension (82.7%), smoking (74.7%), diabetes (62.4%), heart diseases (71.5%), and dyslipidaemia (58.9%). Majority responded that the common preventive measure to prevent stroke was reduced alcohol intake 216(57.8%) followed by avoid or quit smoking 212(56.7%), check blood pressure regularly 211 (56.4%). High knowledge regarding stroke was associated with higher age, higher income and higher education.

Keywords: Knowledge, preventive measures, risk factors, stroke.

INTRODUCTION

Stroke is a serious neurological noncommunicable illness that is the third leading cause of death and a substantial source of adult disability globally.[1] Adequate stroke knowledge and awareness are critical for early symptom assessment, medical response, and preventative initiatives. In 2019, 6.55 million individuals died from strokes worldwide, resulting in 143 million disability-adjusted life years.[2,3] In 1970, the World Health Organization (WHO) defined stroke as a "rapidly developed clinical sign of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than vascular origin".[4]

In India, the situation is dire, it is currently the fifth leading cause of disability and the third leading cause of death.[5] According to research, the prevalence ranges from 1.27 to 2.20 cases per thousand persons.[6,7] According to the Indian Global Burden of Disease Study 1990-2019, stroke was responsible for most disability-adjusted life years (DALYs) and mortality from neurological disorders in India.[8]

An alarming increase in the prevalence of stroke has been observed in India and other developing countries because of a prolonged lifespan combined with rising trends in hypertension, diabetes, smoking, and stress in daily life.[9] Knowledge and understanding of risk factors and warning indicators can help prevent harm. However, little is known regarding the general public's understanding of risk factors for stroke. Every minute during an ischemic stroke around 1.9 million neurons can be lost. Delays in treatment can lead to more severe brain damage, greater disability, lower chances of recovery, increased risk of death

Despite advancements in healthcare and education, many individuals are still unaware of the key risk factors, warning signs, and the importance of early intervention in stroke management. Lack of knowledge can result in delayed responses to stroke symptoms, leading to severe complications, higher mortality rates, and poorer rehabilitation outcomes.

By identifying knowledge gaps and response times, the study can guide healthcare strategies to improve awareness, prevention, and intervention, ultimately reducing the burden of stroke on individuals and society.

To assess the level of knowledge about stroke among general patients attending tertiary care hospital including awareness of stroke risk factors, symptoms, preventive measures and importance of seeking immediate medical attention after experiencing stroke symptoms. To determine the association between sociodemographic factors (such as age, gender, education, and occupation) and the level of stroke-related knowledge among the patients.

MATERIALS AND METHODS

Study Design: An observational cross-sectional study

Study Setting: General and outpatient departments of tertiary care hospital

Study Population: Patients visiting tertiary care hospital, including both general patients and those with history of stroke or stroke related risk factors.

Inclusion Criteria

- Both male and female patients aged above 18 years attending tertiary carehospital.
- The patients who have visited the hospital for any medical concern.
- Patients who were willing to participate and provided informed consent.

Exclusion Criteria

- Those patients who were unable to communicate due to cognitive impairment or severe neurological deficits.
- Those patients with a history of a recent stroke, within the past 3 months
- Those patients who were not given informed consent.

Sample size: A study done by Sirisha et al,[10] found that 56.9% of the study population were had knowledge of stroke symptoms. According to this percentage, considering the allowable error of 6% at a 95% confidence interval thus the sample size is calculated by using the formula:

$N = Z^2PQ/L^2$

Where, Z= Standard normal table value, P= 56.9%, Q=100-P, and L = allowable error (9% of P).

Sample size (N) = Z^2PQ/L^2

= $[(1.96)^2 \times 56.9x\ 43.1) / (5.12\times 5.12] = 375$

N = 375 people.

Study period: 5 months.

Ethical considerations: The Ethical clearance for the study was taken from the institutional ethics committee, at tertiary care hospital. The study was initiated only after getting permission from them, and after taking informed consent from every participant.

Data collection: The study has been conducted under the Department of Neurology, at tertiary care hospital. The data collection was done by using thepre tested, pre structured, predesigned questionnaire. The participants were explained about the study and informed consent was taken before administering the questionnaire. The questionnaire included the knowledge regarding stroke risk factors, warning signs, preventive measures, socio demographic factors etc.

Statistical analysis: This data was collected and entered a Microsoft Excel sheet and analysis was done by using Statistical Package for Social Sciences (SPSS) software 25.0 Version. Qualitative data was represented as percentages and quantitative data was represented as means and standard deviation. To find out the significance of the association, a chi-square square test was done. P value of less than 0.05 was considered as statistically significant at a 95% confidence interval.

RESULTS

A total of 375 study participants were included, and the analysis was done. The mean age of the study population was 39.79±13.04 years. Out of 145 study participants, 190 (50.7%) were males and 185 (49.3%) were females.

Table 1: Distribution of study participants based on sociodemographic factors

Parameters	Category	Frequency	Percentage (%)
Age	<20	12	3.2
	2 – 30	91	24.3
	31 – 40	109	29.1
	41 – 50	95	25.3
	51 – 60	40	10.7
	> 60	28	7.5
Sex	Female	185	49.3
	Male	190	50.7
Occupation	Unskilled	93	24.8
	Semi Skilled	111	29.6
	Skilled	91	24.3
	Professional	15	4.0
	Unemployed	65	17.3
Education	No education	39	10.4
	Primary	26	6.9

	Higher	80	21.3
	Graduate	127	33.9
	Post graduate	103	27.5

From [Table 1], concludes that majority were in the age group 31 to 40 years 109(29.1%) and 95(25.3%) were in the age group 41 to 50 years. About 111(29.6%) were semiskilled workers and 93(24.8%) were unskilled workers. About 127(33.9%) were graduates & 103(27.5%) were postgraduates.

Majority responded that the common organ affected during a stroke was brain 251(67%) followed by heart 120(32%), lung 3(0.7%) and kidney 1(0.3%) [Figure 1].

Figure 1: Organ affected during a stroke

Table 2: How did you acquire knowledge about stroke? (multiple responses)

How did you acquire knowledge about stroke?	Frequency	Percentage (%)
Health care professional	158	42.6%
Social media	148	39.9%
Television/Radio	87	23.5%
Books/Articles	74	19.9%
Others	97	26.1%

About 148(42.6%) were acquired knowledge about stroke from health care professional followed by social media 148(39.9%), television/radio 87(23.5%), books /articles 74(19.9%) and others 97(26.1%) [Table 2].

Table 3: Do you think any of the following risk factor can cause stroke ? yes (multiple responses)

Do you think any of the following risk factor can causestroke ? yes	Frequency	Percentage (%)
Hypertension	310	82.7
Smoking	280	74.7
Heart disease	268	71.5
Tobacco	264	70.4
Diabetes	234	62.4
Dyslipidaemia	221	58.9
Obesity	225	60.0

[Table 3], indicates that about the study participants thought that the following were the risk factors which cause stroke, Hypertension (82.7%), smoking (74.7%), diabetes (62.4%), heart diseases (71.5%), and dyslipidaemia (58.9%).

About 134(35.9%) participants responded that stroke was due to blood clot in the brain, 102(27.3%) were responded that stroke was due to bleeding in the brain and 235(63%) were not sure about the answer.

Table 4: Warning signs of stroke

Warning signs of stroke	Frequency	Percentage (%)
Inability to move arms or legs	262	69.9
Difficulty speaking	244	65.1
Sudden deviation of the mouth	241	64.3
Loss of consciousness	224	59.7
Loss of balance	214	57.1
Sudden drooping of the face	187	49.9
Sudden severe headache	157	41.9
Difficulty understanding speech	146	38.9
Dizziness or vertigo	142	37.9
Sudden confusion	127	33.9

Majority of the study participants 262(69.9%) responded that the common warning sign of stroke was that inability to move arms or legs, followed by difficulty speaking 244(65.1%), sudden deviation of the mouth 241(64.3%), loss of consciousness 224(59.7%), loss of balance 214(57.1%), sudden drooping of the face 187(49.9%), sudden severe headache 157(41.9%), difficulty understanding speech 146(38.9%), dizziness or vertigo 142 (37.9%) and sudden confusion 127(33.9%) [Table 4].

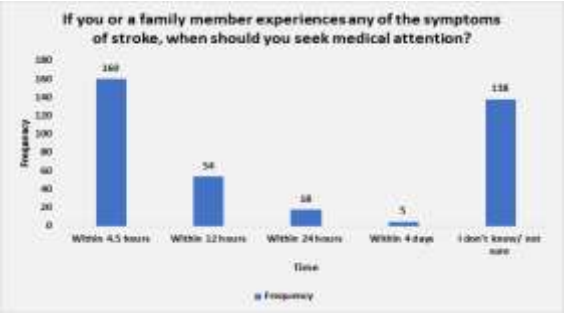

Figure 2: If you or a family member experiences any of the symptoms of stroke, when should you seek medical attention?

When you or family member experiences any symptoms of stroke then the time to seek medical attention was, 160(42.7%) responded that they seek medical attention within 4.5 hours, 54(14.4%) were within 12 hours, 18(4.8%) were within 24 hours and 5(36.8%) were within 4 days and about 138(36.8%) were not sure about their answer [Figure 2].

About 109(29.1%) responded that they know about the injection (thrombolysis) that can dissolve blood clots in the brain during a stroke. Time required was 62(16.5%) were within 4.5 hours, 19(5.1%) responded that within 12 hours, 6 (1.6%) were within 24 hours and 2 (0.5%) were within 4 days and about 141(37.6%) were not sure about their answer.

About 68 (18.4%) were know about mechanical thrombectomy, a procedure to remove blood clots from the brain during a stroke. Time required was 43(11.6%) responded that within 24 hours,6 (1.6%) was within 2 days and 3(0.8%) were within 4 days and about 162(43.8%) were not sure about their answer.

About approximately 121 (32.3%) study participants had low knowledge, while 254 (67.7%) had moderate knowledge regarding stroke.

Table 5: Awareness Vs sociodemographic factors

Parameters	Category	Low awareness		Moderate awareness		P-value
		Count	%	Count	%	
Age	<20	6	50.0%	6	50.0%	0.404 (Insignificant)
	21 - 30	24	26.4%	67	73.6%	
	31 - 40	33	30.3%	76	69.7%	
	41 - 50	31	32.6%	64	67.4%	
	51 - 60	16	40.0%	24	60.0%	
	> 60	11	39.3%	17	60.7%	
Sex	Female	68	36.8%	117	63.2%	0.077 (Insignificant)
	Male	53	27.9%	137	72.1%	
Occupation	Unskilled	45	48.4%	48	51.6%	0.000* (Highly significant)
	Semi Skilled	31	27.9%	80	72.1%	
	Skilled	15	16.5%	76	83.5%	
	Professional	5	33.3%	10	66.7%	
	Unemployed	25	38.5%	40	61.5%	
Education	No education	27	69.2%	12	30.8%	0.000* (Highly significant)
	Primary	16	61.5%	10	38.5%	
	Higher	34	42.5%	46	57.5%	
	Graduate	28	22.0%	99	78.0%	
	Post graduate	16	15.5%	87	84.5%	

About 85.5% of skilled workers and 72.1% of semiskilled workers had moderate awareness, while 51.6% of unskilled workers had moderate awareness. About 84.5% of postgraduates and 78% of graduates had moderate awareness, while 30.8% of uneducated had moderate awareness & 38.5% of study participants who had completed primary education had moderate awareness. This difference observed between groups was found to be statistically significant ($p<0.05$) [Table 5].

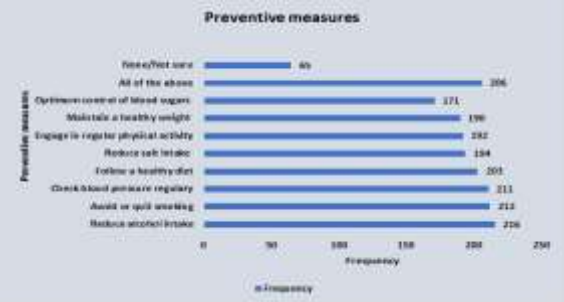

Figure 3: What measures should be taken to prevent stroke ?

Majority responded that the common preventive measure to prevent stroke was reduced alcohol intake 216(57.8%) followed by avoid or quit smoking 212(56.7%), check blood pressure regularly 211(56.4%), follow healthy diet 203(54.3%), reduce salt intake 194(51.9%), engage in regular physical activity 190(50.8%), optimum control of blood sugars 171(45.7%), and 65(17.4%) participants were not sure of their answer [Figure 3].

DISCUSSION

The present study was conducted to assess the level of awareness of stroke risk factors, symptoms, and preventive measures. In the present study of the total 375 study participants 50.7% were male and 49.3% were female. Similar findings were observed in study done by Liang et al,[11] who reported that 59% were male. Most of the patients were in the age group 31 to 40 years 109(29.1%) and 95(25.3%) were in the age group 41 to 50 years. The present study findings were inconsistent with study done by Deepthi et al,[12]

who found that the majority (41.3%) were in the 41 to 60 years age group.

The Majority of the study participants responded that the common organ affected during a stroke was brain 251 (67%). About 148 (42.6%) were acquired knowledge about stroke from health care professional followed by social media 148(39.9%), television/radio 87(23.5%), books /articles 74(19.9%) and others 97(26.1%). About 134(35.9%) participants responded that stroke was due to blood clot in the brain, 102(27.3%) were responded that stroke was due to bleeding in the brain.

The risk factors which cause stroke, Hypertension (82.7%), smoking (74.7%), diabetes (62.4%), heart diseases (71.5%), and dyslipidaemia (58.9%). The present study findings were consistent with study done by Liang et al,[11] who stated that the common risk factors known by respondents were advancement of age (78.9%), smoking (48.1%), hypertension (82.1%), family history of stroke (76.9%). The most common risk factors observed worldwide were hypertension, smoking, stress, and obesity.

The majority of the study participants 262(69.9%) responded that the common warning sign of stroke was that inability to move arms or legs, followed by difficulty speaking 244(65.1%), sudden deviation of the mouth 241(64.3%), loss of consciousness 224 (59.7%). The present study findings were consistent with study done by Deepthi et al,[12] who found that the three most common warning signs of stroke recognised were difficulty in speaking (59.4%), weakness of on side of the body (54%), numbness of one side of face or body (52%).

The majority responded that the common preventive measure to prevent stroke was reduced alcohol intake 216(57.8%) followed by avoid or quit smoking 212(56.7%), check blood pressure regularly 211(56.4%), follow healthy diet 203(54.3%), reduce salt intake 194(51.9%), engage in regular physical activity 190(50.8%), optimum control of blood sugars 171(45.7%).The present study findings were consistent with Liang et al,[11] study who reported that the common preventive practices by the respondents were Checking blood pressure regularly (74.4%), quitting smoking (64.1%), reducing alcohol intake (71.8%), attending follow up clinics (57.1%), avoiding fatty foods (51.9%).

About 85.5% of skilled workers and 72.1% of semiskilled workers had moderate awareness, while 51.6% of unskilled workers had moderate awareness. About 84.5% of postgraduates and 78% of graduates had moderate awareness, while 30.8% of uneducated had moderate awareness and 38.5% of study participants who had completed primary education had moderate awareness. This difference observed between groups was found to be statistically significant.

Higher awareness of stroke related to older age, higher income, and higher education. Higher education, higher income, and urban residence have been identified as key factors influencing stroke awareness in various research from India and developed nations.[13-17] Previous research has found that male gender is related with both higher,[1819] and lower awareness,[20,21] but gender was not significantly associated with awareness in this study.

CONCLUSION

The Majority of the study participants responded that the common organ affected during a stroke was brain 251(67%). According to the study, patients who attend a tertiary care hospital have a modest level of general awareness about stroke. Although most participants were aware of common risk factors and symptoms, there was a lack of knowledge on the availability of time-sensitive treatments including mechanical thrombectomy and thrombolysis as well as the necessity of an immediate medical response. Higher awareness levels were substantially correlated with both skilled employment and higher educational attainment. Organized, community-based awareness campaigns emphasizing stroke symptom assessment, emergency intervention, and prevention are desperately needed. Enhancing community readiness and improving stroke outcomes may be achieved by incorporating stroke education into regular medical encounters, public health initiatives, and social media platforms.

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