Research Article

Community stroke awareness: Knowledge, attitude, and health-seeking behavior of adults in an urban slum of Hyderabad, India

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ABSTRACT

Background: Stroke is a major cause of chronic adult disability and mortality globally, with rising incidence in India. There is a paucity of Indian studies on community stroke knowledge, attitude, and health-seeking behavior. **Objectives:** The objective of this study is to assess the stroke awareness in terms of knowledge, attitude, and specific health-seeking behavior of adults in an urban slum. **Materials and Methods:** The present study was a population-based cross-sectional study conducted in an urban slum of greater Hyderabad. By cluster sampling method, 396 adult residents of an urban slum were personally interviewed using a pre-tested semi-structured questionnaire. **Results:** The mean age of participants was 43.25 (±9.85) years, 181 (45.71%) were females and 215 (54.29%) were males. 278 (70.20%) participants were aware of the term stroke, 35 (12.59%) participants knew brain to be the affected organ in stroke, 237 (85.25%) participants had knowledge of at least one symptom of stroke, 260 (93.52%) participants had knowledge of at least one complication of stroke, 170 (61.15%) participants had knowledge of at least one risk factor of stroke, and 36 (12.94%) participants had knowledge of at least one mode of prevention of stroke. Health-seeking behavior: 76 (21.34%) participants were undergoing periodic health checkups including screening for diabetes and hypertension. **Conclusion:** Stroke awareness in terms of knowledge, attitude, and health-seeking behavior among adults in an urban slum of Hyderabad, India, was observed to be low. Community health education programs focused on integrated early stroke identification and preventive measures would ease the mammoth burden of stroke morbidity and mortality for both patients and health systems.

KEY WORDS: Stroke; Community; Knowledge; Awareness; Attitude; Health-seeking Behavior

INTRODUCTION

Worldwide, stroke is the most common cause of mortality after coronary artery disease and the most common cause of chronic adult disability.[1] More than four-fifths of all strokes occur in developing countries. In India too, stroke is one of the leading causes of death,[2] and crude prevalence rates demonstrated from various studies range from 1.27 to 2.20/1,000.[3-6]

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Age is an important non-modifiable risk factor for stroke, and the mean age of stroke onset in India (63 years) is lower than that in Western countries.[6] Diabetes mellitus, hypertension (HTN), tobacco and alcohol use, low hemoglobin, low high-density lipoprotein (HDL), and elevated low-density lipoprotein (LDL):HDL ratio are other important modifiable risk factors associated with stroke.[6-8]

Awareness of warning signs and symptoms of stroke is essential in the general population for rapid access to acute medical services, i.e., thrombolysis which is an important predictor of stroke outcome.[9,10] In India, however, awareness of the warning symptoms of stroke among general public is far from satisfactory. Studies reveal that about one-fourth of the urban and one-third of rural respondents who were unaffected had no knowledge of any warning symptom of

stroke. Only 55% of the urban population was aware of one warning symptom of stroke; 16.2% were aware of two symptoms; only 6.2% could identify three symptoms.[11,12]

Community-based existing awareness studies assessing baseline knowledge attitude and practices are essential for effective stroke prevention and control strategies. Very few stroke awareness Indian studies have been conducted in the general population. Urban slum residents are socioeconomically disadvantaged with limited access to formal health-care and health promotion-related information. The present study aims to assess stroke awareness in terms of knowledge, attitude, and specific health-seeking behavior of adults residing in an urban slum.

MATERIALS AND METHODS

Approval from the institutional review board was obtained before commencement of the study. The present study was a population-based cross-sectional study. A sample size of 396 was obtained using the formula for a prevalence survey; the prevalance of awareness of stroke was taken as 45%[1] and using the formula $n=4pq/d^2$. (d is the absolute precision, taken as 5% in the present study) Approval was taken from the institutional ethics committee before the commencement of the study.

The study was conducted in an urban slum, the field practice area of the urban community health training center of a teaching institute. The community health center has been providing primary health-care services for about 40,000 population residing in an urban ward of Greater Hyderabad and is largely slum dominated. This ward consists of areas/ nagars demarcated for election purposes. Each area comprises of 2–3 lanes. Each area was considered as one cluster. The first house in each lane was considered to be the one selected by simple random technique/from table of random numbers following which every fifth house was chosen by systematic random sampling method, until the desired sample of 20 was attained in each lane. Thus, a final sample size of 396 was attained.

All persons who were 20 years of age and above and only one person from each selected house were eligible to participate in the study. After explaining the purpose of the study and obtaining consent,a pretested semistructured questionnaire was administered to the participants by the researchers. The questionnaire included sociodemographic characteristics, stroke-specific knowledge, attitude, and health-seeking behavior of the participants. The sociodemographic characteristics include age, gender, literacy, education, religion, and family income. Other variables that were assessed include the history of tobacco consumption in any form, HTN, and diabetes and whether any household member had a stroke before.

Under knowledge, the subjects were asked if they have heard of the term "stroke" in the vernacular language, warning signs and symptoms, organ affected, risk factors, complications, whether the nsoet of stroke was sudden or gradual, and the various treatment options available. To assess attitude; participants were asked questions like: Is stroke communicable? where they would take a stroke patient for treatment, what would be the ideal time duration to bring/take a stroke patient for treatment. They were questions about if stroke is a disease/ or it can occur due to incurred divine wrath or purpurted black magic, whether one can be completely cured of stroke, whether stroke could be prevented or not, and if replied in affirmative; the need for various preventive measures. Under health-seeking behavior, participants were asked if they checked their blood pressure and diabetic status regularly and history of cessation of tobacco consumption.

Statistical Analysis

Data analysis was done using Microsoft Excel. Descriptive statistics including percentages, mean, and standard deviation are used to describe sociodemographic variables, knowledge, attitude, and health-seeking behavior of the participants. Chi-square test/Fischer's exact test was applied wherever applicable. A $P < 0.05$ was considered statistically significant.

RESULTS

The study was conducted among 396 participants, the mean age of participants was observed to be 43.25 (±9.85) years, more than half 204 (51.52%) participants, belonged to the age group of 41–60 years, and 119 (30.05%) belonged to the age group of 20–40 years. Among the participants, 181 (45.71%) were females and 215 (54.29%) were males. The difference in the gender of participants was not found to be statistically significant ($P > 0.05$). More than half 168 (60.43%) participants were consumers of tobacco in any form, majority 136 (80.95%) of whom were males and 32 (28.57%) were females. 124 (44.60%) participants were either diabetic or hypertensive.

The demographic characteristics of participants are depicted in Table 1.

Of the total, 278 (70.20%) participants were aware of the term stroke/pakshavatam/lakva/palish and 118 (29.80%) were not aware of the term stroke. Among those aware of stroke, 19 (6.83%) themselves had suffered from stroke and 81 (29.14%) participants knew someone who had ever suffered from stroke.

Knowledge regarding stroke was assessed on the following parameters: Affected organ, symptoms, risk factors, etiology, complications, and preventive measures. It was considered as a correct response if a participant could correctly answer

at least one response to questions on the above parameters. Among 278 participants, 35 (12.59%) participants knew brain to be the affected organ in stroke, and 7 (2.52%) incorrectly responded that heart was affected in stroke, whereas the majority 236 (89.20%) participants did not know the affected organ during a stroke.

237 (85.25%) participants had knowledge of at least one symptom of stroke and none 278 (100%) had knowledge of more than one symptom, 260 (93.52%) participants had knowledge of at least one complication of stroke, 170 (61.15%) participants had knowledge of at least one risk factor of stroke, and 36 (12.94%) participants had knowledge of at least one mode of prevention of stroke.

Knowledge gap was evident in majority of participants as only 17 (6.11%) participants knew what causes stroke and 231 (83.09%) did not have any knowledge about it, and 236 (84.89%) and 200 (71.94%) participants did not have any knowledge of organ affected in stroke and preventive measures to be taken for stroke prevention. 32 (11.51%) participants had incorrect knowledge and 9 (3.23%) participants had no knowledge of symptoms of stroke. 42 (15.11%) participants had incorrect knowledge of preventive measures for stroke prevention. 32 (11.51%) participants felt that stroke is contagious in nature and 123 (44.24%) participants did not know whether stroke could be treated or not.

Demographic characteristics	*n* (%)
Age (years)	
20–40	119 (30.05)
41–60	204 (51.52)
>60	73 (18.43)
History of tobacco consumption	
Yes	168 (60.43)
No	110 (39.57)
History of diabetes/HTN	
Yes	124 (44.60)
No	154 (55.40)
Education status	
Illiterate	89 (22.47)
Educated up to 5th grade	149 (37.63)
Educated up to 10th grade	112 (28.28)
Intermediate	33 (8.33)
Degree holder	13 (3.28)
Monthly family income (INR)	
<5000	32 (8.08)
5000–10000	215 (54.29)
10000–15000	129 (32.58)
>15000	20 (5.05)

HTN: Hypertension

Knowledge of stroke parameters among study participants is presented in Table 2.

Attitude was assessed in response to the question "What would you do if someone around you suffered a stroke?" 143 (51.44%) participants replied that they would take the patient to hospital immediately, 69 (24.82%) participants replied that they would use traditional methods/medicines, 50 (22.30%) participants would reassure the patient and take them to hospital after 2–3 h, and 2 participants each replied that they would run away and do nothing as healthcare was too expensive.

Preventive strategies: In the present study, 40 (14.89%) participants responded that they would pray to God as a preventive measure for stroke, 2 participants responded that they would isolate themselves from any person suffering from stroke, 200 (71.94%) participants did not know of any preventive strategy, and 36 (12.94%) participants knew anyone preventive measure for stroke. More than half 169 (60.79%) of participants were not aware of the importance and need for regular screenings for HTN and diabetes.

Health-seeking behavior among the participants is reflected in those 76 (21.34%) participants who were undergoing periodic health checkups including screening for diabetes and HTN.

More than half 168 (60.43%) participants were consumers of tobacco in any form, majority 136 (80.95%) of whom were males and 32 (28.57%) were females.

DISCUSSION

Poor public knowledge of stroke warning signs and risk factors limits the effective stroke intervention and prevention.[13] In India, very few studies have been carried out to determine the causes of deficiencies in knowledge, attitude, and practice of stroke, in spite of stroke being a major cause of disability and mortality in the country.[14] The present study was a population-based study conducted in an urban slum in Hyderabad to study stroke awareness in terms of knowledge, attitude, and health-seeking behavior of its adult residents.

In the present study, of a total of 396 participants, 119 (30.05%) belonged to the age group of 20–40 years which is significant as 10–15% of stroke in India occurs at <40 years of age. 118 (29.80%) participants were not aware of the term stroke. The following results are of remaining 278 participants.

Affected Organ

Among remaining 278 participants, 35 (12.59%) participants knew the brain to be the affected organ in stroke. Some studies[14-16] have reported that majority of respondents had correctly identified "brain" as the affected organ in stroke, which differs from the present study and can be explained

Knowledge	*n* (%)		
	Correct response/s	Incorrect response/s	No knowledge
Affected organ	35 (12.59)	7 (2.51)	236 (84.89)
Etiology	17 (6.11)	30 (10.79)	231 (83.09)
Symptoms	237 (85.25)	32 (11.51)	9 (3.23)
Treatment	43 (15.47)	112 (40.29)	123 (44.24)
Risk factors	170 (61.15)	0 (0)	108 (38.85)
Complications	260 (93.52)	0 (0)	18 (6.47)
Preventive measures	36 (12.94)	42 (15.11)	200 (71.94)

by the difference in study population. A study by Pandian *et al*.[12] demonstrated very poor knowledge, and in studies by Neau *et al*.[16] and Yoon *et al*.,[18] a very few believed that stroke was a heart problem which was similar to the response of 7 (2.51%) participants of the present study.

Risk Factors

In the present study, 170 (61.15%) participants had knowledge of at least one risk factor of stroke. Similar studies conducted in different countries have documented predominantly inadequate knowledge about stroke risk factors and stroke warning signs among their respective participants. Knowledge about stroke risk factors (HTN, smoking, alcohol, diabetes, ischemic heart disorder, and atrial fibrillation) is observed to be poorest among those with the highest risk for stroke.[17] Highest response rate was observed among Australians followed by Germans, Indians, and Brazilians.[12,17-19]

Warning Signs/Symptoms

In the present study, even though 237 (85.25%) participants had knowledge of at least one warning sign/symptom of stroke, none 278 (100%) of the participants had knowledge of more than one warning sign/symptom. This inadequate knowledge regarding the warning signs/ symptoms of stroke was observed inspite of the fact that 35% of participants were either stroke affected or knew someone who was affected with stroke. Other studies have reported variable findings, and a French study by Neau *et al*.[16] and Australian study by Yoon *et al*.[18] reported poor knowledge (49.9% and 49.8%), respectively, about stroke warning signs (≥1) among its participants in spite of their knowledge about risk factors being moderate. In the population-based random-digit telephone survey in the U.S. by Schneider *et al*.,[13] 70% of respondents had correctly named at least one established stroke warning sign and the knowledge about stroke risk factors was observed to be poorest among those with the highest risk for stroke.

In studies by Campos-Sousa *et al*.[17] from Brazil and Yoon *et al*.,[18] 41.1% and 23.8% of the respondents, respectively, had no knowledge about warning symptoms, whereas in the present study, 14.75% of participants had no/incorrect knowledge about warning symptoms.

Indian studies also have reported poor knowledge of warning sign/symptom of stroke.[11,12] In the study by Pandian *et al*.,[12] 23% of the participants did not know a single warning symptom of stroke, which more than that observed in the present study. Improved socioeconomic status and higher education have shown to raise awareness of the warning symptoms of stroke for both rural and urban subjects.[11,12]

Better knowledge of warning signs/symptoms and complications would translate into faster and better identification of stroke, it may lead to improved attitudes, and if translated into health-seeking behaviour/practices would result in improved patient outcomes, whereas knowledge of risk factors and preventive strategies if translated into lifestyle modification would go a long way in reducing the morbidity and mortality due to stroke as well as burden on the health system in India.

Attitude toward stroke is affected by knowledge and has been an almost unexplored area of research.[14] In the present study, only 143 (51.44%) participants replied that they would take the patient to hospital immediately, which is <88% and 75% of respondents in studies by Neau *et al*.[16] and Schneider *et al*.,[13] respectively, who would call the emergency services. In the study by Campos-Sousa *et al*.,[19] 93.6% of respondents opined immediate treatment of stroke to be important. Greater awareness due to the difference in education and socioeconomic status of the participants could have contributed to difference in attitude between the studies.

In the present study, 69 (24.82%) participants replied that they would use traditional methods/medicines and 2 participants each replied that they would run away and do nothing as health care was too expensive. These responses seem indigenous to Asian studies as is also evident in the

Indian study by Pandian *et al*.[12] where a small proportion (3%) of subjects believed in witchcraft, faith healing, and homeopathic and ayurvedic treatment and in a Korean study by Kim and Yoon,[20] respondents preferred herbal medicine and other traditional methods of treatment for stroke. In an Iranian study by Haghighi *et al*.,[21] most of the participants responded that treatment of stroke is difficult and expensive.

Preventive Strategies

In the present study, 40 (14.89%) participants responded that they would pray to God as a preventive measure for stroke. A deep-rooted belief in a higher power to prevent any mishap including stroke is evident from the above responses. Two participants responded that they would isolate themselves from any person suffering from stroke, 200 (71.94%) participants did not know of any preventive strategy, and 36 (12.94%) participants knew anyone preventive measure for stroke.

In the present study, 21.34% of participants were undergoing periodic health checkups including screening for diabetes and HTN in spite of 124 (44.60%) participants being either diabetic or hypertensive. Knowledge of at least one symptom of stroke, risk factor, and complications is not reflected in the health-seeking behavior of the participants in terms of tobacco consumption, and regular screenings and health facility/physician visits.

Intervention programs on primordial, primary, and secondary preventive measures for stroke are imperative for reducing stroke-related morbidity and mortality, especially in developing countries like India. Community health education measures through innovative, short, culturally relevant, focused digital, print, and social media spots/campaigns may be developed for tapping formal groups as well as informal groups (auto-rickshaw drivers, taxi drivers, and daily wage laborers) who are more at risk. Increasing stroke knowledge by means of public and professional education resulted in a shorter time of presentation to the emergency department following stroke onset.[22] The role of physicians too in stroke prevention cannot be overemphasized.[14]

Strengths

There are very limited studies on community awareness regarding stroke in India. Considering the disease burden of stroke of India, assessment of community awareness and attitude regarding stroke can provide useful insights while incorporating community health education in areas of stroke prevention.

Limitations

The present study could not be conducted as a multicentric study due to resource constraints.

CONCLUSION

Stroke awareness in terms of knowledge, attitude, and health-seeking behavior among adults in an urban slum of Hyderabad is low. Health education programs focused on early stroke identification, risk factors, complications, and primordial, primary, and secondary preventive measures would ease the mammoth burden of stroke morbidity and mortality for both patients and health systems.

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