Original Research Article

Awareness of risk factors and early signs of stroke in high risk population of Pune region

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ABSTRACT

Background: Knowledge about risk factors and early signs of stroke helps in early intervention and may lead to a better functional outcome for the patient. This study was conducted to assess awareness about stroke in the high risk population of Pune region.

Methods: Ethical committee clearance was taken. A total of 180 samples were recruited and written consent was obtained. Data was collected using a close-ended, self made questionnaire, which was face validated, in an interview based format. Collected data was analysed using descriptive statistics.

Results: 43.3% participants were fully aware about stroke. 24.2% participants couldn't identify a single risk factor. 79% participants did not have self risk perception about stroke. Only 2.2% participants identified all the signs and symptoms of stroke correctly. 85.4% participants believed that early treatment of stroke increases chances of recovery. Only 32.5% participants would call the ambulance on occurrence of stroke. Awareness about risk factors and early signs of stroke seems to be higher among high risk population belonging to urban areas of Pune region, with higher literacy levels.

Conclusions: There is significant lack of awareness about risk factors and early signs of stroke. Public health education seminars should be conducted to increase awareness, especially targeting population at high risk. Outreach to the rural population should be improved.

Keywords: Risk, Stroke, Prevention, Signs, Urban, Rural

INTRODUCTION

Stroke is the one of the leading causes of death and disability all over the world and the second most common cause of global DALYs (disability-adjusted life years).[1] The crude prevalence of stroke in India ranges from 44.29 to 559 per100000 population and its cumulative incidence in India ranges from 105 to 152/100,000 persons per year, varied across the country. According to previous research, most studies about prevalence of stroke were conducted in urban cities, even though incidence is greater in rural areas.[2] Studies are needed which focus on community based surveys including urban as well as rural population.[3,4] The important modifiable risk factors for stroke, as identified by the American Stroke Association are hypertension, diabetes, cardiac disorders (atrial fibrillation, valvular heart disease, coronary heart disease), hyperlipidemia, obesity, physical inactivity, diet, heavy alcohol consumption and excessive cigarette smoking.[5] The five stroke warning signs established by the National institute of neurological disorders and Stroke are numbness or weakness in the face, arms, or legs (unilateral); confusion, difficulty speaking or understanding speech; vision disturbances in one or

both eyes, dizziness, trouble walking, loss of balance or coordination, severe headache with no known cause.[4] Early treatment and intervention in any kind of disease is always beneficial. Awareness about stroke risk factors helps in early identification of self stroke risk and implementation of preventive strategies.[6] Therefore, stroke patients who received r-TPA within 90 minutes of symptom onset had better functional outcomes compared to those who were treated at 181 to 270 minutes from onset.[7] Early symptom recognition is the key to early treatment and improved clinical outcome, which could have an impact on stroke survival and patient's quality of life.[8] One of the most important barriers of immediate thrombolysis therapy of stroke in the developing countries is non-recognition of stroke warning signs by patients at risk, families, the general public, and even health workers in some places. Lack of perception about seriousness of stroke symptoms, residence in rural areas, living far from the hospital, lack of knowledge about stroke, contacting primary care physician before emergency medical services, misinterpretation of warning signs by primary care physician, are the main causes of delay in arrival of the patient to a hospital and delay of treatment.[9]There is poor recognition of stroke symptoms in developing countries.[10] The sources of information available about stroke are also unsatisfactory. In a study conducted in Oman among high risk population for stroke awareness, the results suggested that the participants received stroke information from real life experiences instead of medical professionals.[11] Public knowledge of stroke warning signs and risk factors is imperative to reduce the time between stroke onset and hospital arrival, administering thrombolytic therapy and improve control of stroke risk factors.[12]Increased emergency admissions rather than through general practitioners, increased public access to stroke related information and awareness of stroke and its warning signs and increased thrombolytic treatment has been found associated with FAST awareness campaign for stroke in England.[4,13]

Studies conducted in countries like USA, Nigeria, Oman , Croatia reported deficiencies in awareness about stroke, it's risk factors and warning signs.[6,11,12,14-16] Studies conducted in Gujarat, Karnataka and West Bengal in India have concluded that there is poor awareness about stroke ,its related symptoms & its risk factors in population.[3,17] However, another study conducted in Northwest India revealed better awareness about stroke.[5] To increase public knowledge of stroke and to reduce the time taken by patients to call emergency services when stroke symptoms occur, community-based educational strategies about signs, symptoms and early treatment should be implemented.[18] The population at high risk for stroke should be targeted because they are more prone to occurrence of the disease. However, it is imperative to find out the awareness about stroke before tailoring educational strategies targeting the desired population. Thus, this research is conducted to find out the awareness of risk factors and early signs among people at high risk for stroke in Pune region.

METHODS

Study design, set up, sampling technique and sample size

Current study was a cross-sectional survey conducted at hospitals, outpatient clinics, old age homes and de-addiction centers of Pune region. A cluster random sampling technique was used inpresent study and sample size was taken as 200.

Inclusion criteria

People diagnosed with one or more established risk factors of stroke (hypertension, diabetes, obesity, known cardiovascular disease, hyperlipidemia, chronic smokers, and chronic alcoholism) were included in the study.

Exclusion criteria

People having a history of a previous stroke or Transient Ischemic Attack and health care professionals were excluded from this study.

Procedure

The Institutional Ethics committee approved this study. Informed written consent was obtained from the participants who were willing to participate. A cross sectional survey based study was carried out using a self-made, structured, close ended questionnaire which was face validated by 3 experts in the field. A draft questionnaire was developed initially which was pre-tested on a sample of 10 participants with established risk factors of stroke and necessary changes were made. The final questionnaire was divided into 2 sections. The first section collected demographic data of the participants including age, gender, education, residence, occupation and diagnosis. The second section included 10 close-ended questions about awareness of the term stroke, risk factors, self risk perception, early signs, response to stroke symptoms, prevention and recurrence and source of information. Data was collected in an interview based format. Any doubts or queries had been addressed and resolved and explanation was provided for the same. No attempts were made to prompt the participants by suggesting answers directly. Once the interview was completed and the questionnaire was submitted, the participants were educated about the warning signs & risk factors of stroke along with primary stroke prevention and the importance of calling the ambulance immediately was also explained to them. The responses were recorded and data analysis was carried out.

Data analysis

Descriptive statistics was used to summarize data on demographic variables and awareness about stroke. A spreadsheet was created using the data recorded and the

results were converted into percentile. The results were depicted using tables and charts.

RESULTS

A total of 180 participants were included in this study with 90 (50%) male participants and 90 (50%) female participants. 104 (57.8%) participants belonged to urban areas of Pune and 76 (42.2%) participants belonged to rural areas of Pune. The mean age of the participants was 52.92 years with a SD of 12.32 (range 21 to 90) (Table 1). Out of 180 participants, 78 (43.3%) were fully aware about the term stroke, 79 (43.9%) were somewhat aware and 23 (12.8%) were not at all aware about the term stroke. Hence, only 157 participants had heard about the term 'stroke'.

Risk factors for stroke (n=157)

The most common risk factors for stroke identified by participants were hypertension (52.2%) and diabetes (36.3 %). The least commonly identified risk factors were hyperlipidemia (23.5%), chronic alcoholism (22.9%) and heart disease (22.2%) (Table 2). 38 (24.2%) participants couldn't identify a single risk factor. 119 (75.8%) of the participants mentioned at least one risk factor, while less than half of the participants, 50 (31.9%) could identify at least 3 risk factors. Only 3 (1.8%) participants could identify all the risk factors correctly. When the participants were asked about their perceived risk for stroke, 95 (60.5%) of participants believed that they are not at risk for stroke, 29 (18.5 %) of participants did not know if they are at risk for stroke and only 33 (21 %) participants believed that they are at increased risk for stroke (Figure 1).

Early signs and symptoms of stroke (n=157)

The most commonly identified early sign of stroke by the participants was weakness or paralysis of one side of the body (72.6 %). The correct early signs of stroke that were least recognized by the participants (24.8%) were blurred vision/sudden difficulty in seeing and sudden severe headache (Table 2). 19 (12.1 %) participants couldn't identify a single symptom of stroke. Only 4 (2.5%) participants identified all the signs and symptoms of stroke correctly. 134 (85.3%) participants who were partly aware, mentioned incorrect symptoms of stroke. When the respondents were asked whether they would be able to understand the early signs and symptoms on occurrence of an acute attack of stroke, majority of the participants would not be able to correctly identify it (56%).

Stroke prevention (n=157)

A majority of the participants, 85 (54.1%) believed that stroke is preventable .Only 23 (14.6 %) participants believed that stroke is not preventable whereas 49 (31.2%) participants didn't know.

Response to stroke symptoms (n=157)

Only 51 (32.5 %) participants would call the ambulance immediately. Majority of the participants, 85 (54.1%) would consult their physician/primary care doctor in case they suffer from stroke symptoms. Only a small number of participants would consider other options like asking family members/relatives, 9 (5.7%), take rest, 5 (3.2%), home remedies, 4 (2.5%) and wait and see if symptoms resolve on their own 3 (1.9%).

Stroke recurrence (n=157)

Less than half of the participants, 64 (40.8%) believed that stroke is recurrent (can occur more than once). 54 (34.3%) participants believed that stroke is not recurrent and 39 (24.8%) participants did not know whether or not stroke is recurrent.

Early treatment of stroke (n=157)

A large number of participants, 134 (85.4%) believed that early treatment of stroke increases chances of recovery. Only a minority of participants 14 (8.9%) believed that early treatment of stroke did not improve chances of recovery and 9 (5.7%) participants did not know whether or not early treatment of stroke improved chances of recovery.

Source of information (n=157)

A majority of the participants received information about stroke from community resources like Friends/ relatives, 79 (50.3%), person with stroke, 66 (42%), newspapers/ articles, 32 (20.4%), social media/internet, 20 (12.7%), television/radio, 17 (10.8%), other, 14 (8.9%) ,books/ brochures, 9 (5.7%). Only a small proportion of participants, 23 (14.6 %) received knowledge about stroke from medical professionals.

DISCUSSION

This cross sectional survey based study was conducted to find out the awareness about risk factors and early signs of stroke and it revealed that there is significant lack of awareness. Our study showed that awareness seems to be higher among high risk population residing in urban areas of Pune, compared to rural areas, and in high risk population with higher literacy levels. Out of 180 participants, only 157 participants had heard about the term 'stroke'. Out of the participants unaware about the term 'stroke', majority of the participants, 87% belonged to rural population and 73.9% were illiterate.

Risk factors of stroke

24.2% participants could not identify a single risk factor. This finding is similar to the results obtained by Pandian et al who conducted a study among public in northwest

India and found that 20.7% participants did not know a single risk factor for stroke.[6]

Table 1: Demographic data of selected participants (n=180).

Characteristics	%
Age (years)	
21-40	13.9
41-60	60.5
61-80	23.4
81-90	2.2
Mean+SD	52.92+12.32
Sex	
Male	50
Female	50
Total	100
Education	
Informal	17.8
School	33.3
College	13.9
University and above	35
Total	100
Residence	
Urban	57.8
Rural	42.2
Total	100
Occupation	
Govt/private/self employed	53.4
Housewife	33.3
Unemployed/retired	13.3
Total	100
Co- morbid factors	
Diabetes	47.8
Hypertension	50
Hyperlipidemia	13.9
Obesity	34.4
Chronic smoking	7.2
Chronic alcoholism	11.1
Heart disease	17.8
Multiple risk factors	52.2

Hypertension was the most commonly recognized risk factor for stroke in this study. This may be attributed to the fact that 42.6% of the participants who recognized Hypertension as a risk factor, were on medication for Hypertension which may have led to better awareness of this risk factor. However, the results obtained in previous studies by Naik et al, Willey et al and Kanisek et al reported a higher percentage of participants who recognized Hypertension as a risk factor.[4,7,17] This difference may be attributed to inclusion of rural and urban population in our study as compared to these previous studies which did not include rural population. In a study conducted by Sadighi et al among rural population in Central Pennsylvania, smoking was the most commonly identified risk factor for stroke, which

might have been because of prevalence of smoking being higher in rural areas of USA.[15] On further analysis, out of the participants who were able to recognize atleast one risk factor, the maximum participants belonged to urban population (75.6%) and had higher literacy levels (93.6%) (University & above). Very few participants (1.8%) were able to identify all the risk factors correctly.

Self risk perception

On further analysis about self risk perception, we found that less than one fourth (21%) participants believed they were at an increased risk for stroke. This may be attributed to the fact that very few participants were aware about all the risk factors of stroke, due to which perception of self risk for stroke is less. During interview process, many participants mentioned that since they were on medications, they did not believe they were at an increased risk for stroke. However, those responses were not a part of the data collection process. In a study by Kanisek et al similar results about self risk perception were observed which may be attributed to respondents from both of these studies not receiving adequate information about stroke from health professionals. In another study, conducted by Al Shafaee et al, it was found that only 7.2% participants thought they were at an increased risk for stroke, which maybe attributed to majority of the respondents being illiterate.[12,17] In the current study, it was found that higher number of the participants aware about their increased risk for stroke had higher literacy level (University & above).

Early signs of stroke

It was observed that 12.1% participants couldn't identify a single symptom of stroke. More than half of the participants who couldn't identify a single symptom of stroke belonged to rural population of Pune and had low level of education (School or less). The most common symptom of stroke identified by the participants of this study was weakness of one side of the body. The reason for this may be stroke being more commonly known as paralysis in general population and weakness of one half of the body being the most common representation of this disease in community. This finding is similar to the results obtained in other studies conducted by Khushbu Naik et al, Willey et al, Al Shafaee et al and Kanisek et al.[4,7,12,17] However, in a study conducted by Sadighi et al speech difficulty was the most commonly identified warning sign.[15] This could be attributed to the fact that the source of information about stroke to the population was from various sources viz relative with stroke, media, books and magazines, etc which could have led to better awareness about all risk factors of stroke. In this study, most commonly identified incorrect symptoms of stroke were sudden chest pain (22.3%) and shortness of breath (22.3%).

Table 2: Participant's awareness about stroke risk factors and early signs (n=157).

Parameters	N	%
Risk factors*		
Hypertension	82	52.2
Diabetes	56	35.6
Excessive cigarette smoking	43	27.3
Obesity	40	25.4
Hyperlipidemia	37	23.5
Chronic alcoholism	36	22.9
Heart disease	35	22.2
Don't know	38	24.2
Early signs*		
Weakness of one side of body	114	72.6
Facial weakness	86	54.8
Sudden loss of balance	84	53.5
Speech difficulties	83	52.9
Blurred vision	39	24.8
Sudden severe headache	39	24.8
Sudden chest pain	35	22.3
Shortness of breath	35	22.3
Back pain	17	10.8
Loss of taste and smell	11	7
Pain in abdomen	6	3.8
Don't know	19	12.1

* Multiple responses allowed

In the study conducted by Sadighi et al 39.7% selected chest pain as warning sign of stroke which was attributed to confusion between the symptoms of heart attack and stroke attack.[15,16] In this study, on further analysis about identifying signs during an acute attack of stroke, majority of the participants would not be able to correctly identify if they are having stroke. This may be due to the fact that only a small number of participants (2.5%) are aware of all the signs and symptoms of stroke.

Early treatment of stroke

When the participants were asked about importance of early treatment of stroke, majority of the participants believed that early treatment of stroke leads to better chances of recovery. Similar results were reported in studies conducted by Pandian et al and Al Shafaee et al.[6,12]

Response to stroke

On further analysis about response to stroke symptoms, less than half of the participants would respond by immediately calling the ambulance. This may be attributed to lack of perception about seriousness of symptoms and participants not being aware of their increased risk for stroke. Majority of the participants would respond by consulting the physician, however, the mode of communication was not found out. On the contrary, Al Shafaee et al reported that majority of the

participants would go immediately to a hospital emergency department if they recognizedzed that they were having a stroke.[12] In a study conducted by Sadighi et al[15], almost all of the participants would immediately call emergency medical services.
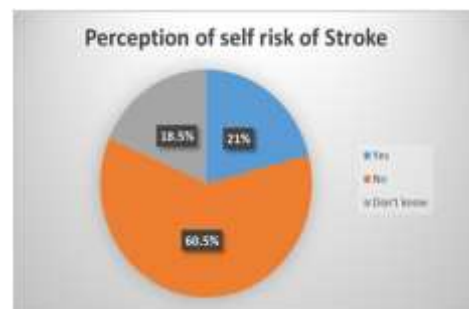

Figure 1: Participant's self-risk perception for stroke.

Source of information

Moving ahead to source of information about stroke, majority of the participants reported receiving information about stroke from community resources. Surprisingly, only a small proportion of participants (14.6%) received knowledge about stroke from medical professionals. This problem should be addressed at the earliest as the majority of the participants in this study would trust a physician for first line of treatment in case of occurrence of signs and symptoms of stroke. This is the first study conducted on high risk population of Pune region in western India which includes participants from both urban and rural areas.

CONCLUSION

This cross-sectional survey based study revealed significant lack of awareness about risk factors and early signs of stroke. Public health education seminars and programs should be conducted to increase awareness about risk factors and early signs of stroke, especially targeting population at high risk. A joint effort should be made by physicians, allied health professionals as well as specialty clinics to conduct awareness campaigns for stroke in various languages, to improve outreach to population with low literacy level. Free health checkups to assess risk factors for stroke can be organized in rural areas with support from the government.

A multifaceted approach including mass media and social media can be used for improving awareness among the general public because on occurrence of stroke, the person accompanying the high risk patient also needs to be aware of the warning signs, for early identification and intervention of stroke. These measures will aid in prevention of stroke occurrence and also at the same time, reducing severity of the disease and disability of stroke patient.

Recommendations

Appropriate measures taken to improve awareness in patients at risk will help in prevention of stroke. This study will help in formulating a strategy, according to the lack in knowledge about stroke found in the target population. It will also help in reducing severity of the disease of the stroke patient and reducing burden of stroke in India.

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