# Stroke Awareness among Hypertensive Patients: Institutional Based Survey in Western Rajasthan, India

Dear Sir,

Stroke incidence has more than doubled in low–middle income countries and decreased by 42% in high-income countries over the last four decades. The average number of deaths due to stroke is more in the low–middle-income countries compared to in high-income countries since 15 years. Stroke affects individuals and their productive life, leading to an enormous negative impact on the socio-economic development of the countries.[1]

Stroke is the second and third major cause of death and disability-adjusted life years, respectively worldwide. Some Indian studies prove that the stroke incidence is approximately 116 to 163 per 100,000 population. The Indian Council of Medical Research has also reported that stroke is the fouth main cause of death and fifth major cause of disability-adjusted life years in India (2016).[2]

Stroke is the most common complication of hypertension. The prevalence of complications that occur due to hypertension is highest in rural communities, whereas the prevalence of hypertension is high in urban communities.[3]

Worldwide hypertensive patients are not having adequate awareness regarding causes, risk factors, prevention, and treatment of stroke. So, this survey was conducted to assess stroke awareness among hypertensive patients.

This descriptive survey was conducted among 400 hypertensive patients to assess stroke awareness, during the period of January 2020 to January 2021 in an institute of western Rajasthan, India, after obtaining prior permission from the institutional ethical committee with the reference number AIIMS/IEC/2020-21/2099. The sample size was calculated using Slovin's formula n = N/[1+ (N e2)], and sampling was done using nonprobability purposive sampling technique.

The hypertensive patients were included based on the following inclusive criteria such as more than 18 years

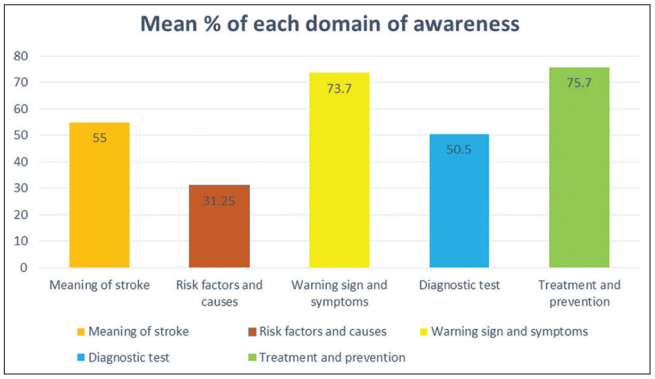


**Figure 1:** Mean percentage distribution of domains of stroke awareness among hypertensive patients

**Table 1: Frequency and percentage distribution of hypertensive patients according to personal and clinical variables**

| Variables | *n*=400 | |
|---|---|---|
| | *f* | % |
| Personal variables: | | |
| Age in years | | |
| 18-30 | 27 | 6.8 |
| 31-60 | 241 | 60.3 |
| >60 | 132 | 33 |
| Gender | | |
| Male | 235 | 58.8 |
| Female | 165 | 41.3 |
| Marital status | | |
| Unmarried | 16 | 4 |
| Married | 347 | 86.8 |
| Widow/widower | 37 | 9.3 |
| Education | | |
| Non-formal education | 167 | 41.8 |
| Primary | 58 | 14.5 |
| Secondary | 33 | 8.3 |
| Higher Secondary | 51 | 12.8 |
| Graduation and above | 91 | 22.8 |
| Occupation | | |
| Government Employment | 69 | 17.3 |
| Private Employment | 57 | 14.2 |
| Unemployment | 18 | 4.5 |
| Self- employment | 136 | 34 |
| Home maker | 120 | 30 |
| Income per month | | |
| <10,000 | 49 | 12.3 |
| 10,000-20,000 | 114 | 28.5 |
| 20,000-50,000 | 179 | 44.8 |
| >50,000 | 58 | 14.5 |
| Social background | | |
| Rural | 235 | 58.8 |
| Urban | 165 | 41.3 |
| Clinical variables: | | |
| Duration of hypertension | | |
| 6 month-1 year | 61 | 15.3 |
| 2-5 years | 199 | 49.8 |
| 6-10 years | 102 | 25.5 |
| >10 years | 38 | 9.5 |
| Duration of treatment | | |
| <1 year | 141 | 35.3 |
| 2-5 years | 166 | 41.5 |
| 6-10 years | 66 | 16.5 |
| >10 years | 27 | 6.8 |
| Co-morbidity of kidney diseases and diabetes mellitus | | |
| Yes | 162 | 40.5 |
| Diabetes | 90 | 55.55 |
| Kidney disease | 42 | 25.92 |
| Both co-morbidity | 30 | 18.51 |
| No | 238 | 59.5 |
| Family history of hypertension, kidney diseases and diabetes mellitus | | |
| Yes | 255 | 63.7 |
| Hypertension | 113 | 44.31 |
| Diabetes | 50 | 19.60 |
| Kidney disease | 12 | 4.70 |
| Multiple disease | 80 | 31.37 |
| No | 145 | 36.3 |
| Body mass index | | |
| < 18.5 Underweight | 19 | 4.8 |
| 18.1-24.9 Normal weight | 249 | 62.3 |
| 25-29.9 Overweight | 117 | 29.3 |
| 30-34.9 Class-I Obesity | 15 | 3.8 |
| Previous information regarding stroke | | |
| Yes | 303 | 75.8 |
| No | 97 | 24.3 |

**Table 2: Level of stroke awareness among hypertensive patients**

| Level of awareness | *f* | % | *n*=400 Mean & SD |
|---|---|---|---|
| Poor (0-8) | 111 | 27.8 | |
| Fair (9-16) | 148 | 37 | 12.93±6.62 |
| Good (17-24) | 141 | 35.3 | |

(Minimum score was 0, and maximum score was 24)

of age, diagnosed with hypertension at least 6 months before, willing to participate, and understanding the study language. Hypertensive patients who had been diagnosed with any type of stroke, brain tumor, head injury, intellectual disability, and mental illness, and hypertensive patients in their perinatal period were excluded from the study.

Socio-demographic Performa was used to collect the socio-demographic details (personal as well as clinical) of the participants. A self-structured awareness questionnaire which was validated by seven experts was used to collect the data through face-to-face interviews. The range between maximum and minimum total score of the questionnaire was divided into three categories. A pilot study was conducted on 10% of the main study as sample.

The data were analyzed by using IBM SPSS version-20. Descriptive and inferential statistics were used to describe the socio-demographic variables of the hypertensive patients using frequency, percentage, mean, and standard deviation. Chi-square was used to make an inference and to determine the association of awareness with socio-demographic variables.

Over the 1-year period, total of 400 hypertensive patients consented to participate in institutional-based stroke awareness survey. The mean standardized age of hypertensive patients was

**Table 3: The association of level of awareness regarding prevention of stroke among hypertensive patients with personal and clinical variables**

| Variables | Level of awareness among hypertensive patients | | | *n*=400 | | |
|---|---|---|---|---|---|---|
| | Poor | Fair | Good | $X^2$ | df | *P* |
| Personal variables: | | | | | | |
| Age in years | | | | | | |
| 18-30 | 12 | 6 | 9 | 10.57 | 4 | 0.032* |
| 31-60 | 60 | 85 | 96 | | | |
| >60 | 39 | 57 | 36 | | | |
| Gender | | | | | | |
| Male | 66 | 84 | 85 | 0.40 | 2 | 0.818 |
| Female | 45 | 64 | 56 | | | |
| Marital status | | | | | | |
| Unmarried | 6 | 4 | 6 | 1.95 | 4 | 0.745 |
| Married | 95 | 128 | 124 | | | |
| Widow/widower | 10 | 16 | 11 | | | |
| Education | | | | | | |
| Non-formal education | 64 | 77 | 26 | 64.22 | 8 | 0.00* |
| Primary | 12 | 26 | 20 | | | |
| Secondary | 11 | 9 | 13 | | | |
| Higher Secondary | 10 | 13 | 28 | | | |
| Graduation and above | 14 | 23 | 54 | | | |
| Occupation | | | | | | |
| Government Employment | 9 | 15 | 45 | 47.55 | 8 | 0.00* |
| Private Employment | 15 | 15 | 27 | | | |
| Unemployment | 4 | 6 | 8 | | | |
| Self- employment | 47 | 59 | 30 | | | |
| Home maker | 36 | 53 | 31 | | | |
| Income per month | | | | | | |
| <10,000 | 25 | 14 | 10 | 39.94 | 6 | 0.00* |
| 10,000-20,000 | 41 | 46 | 27 | | | |
| 20,000-50,000 | 37 | 72 | 70 | | | |
| >50,000 | 8 | 16 | 34 | | | |
| Social background | | | | | | |
| Rural | 81 | 96 | 58 | 29.60 | 2 | 0.00* |
| Urban | 30 | 52 | 83 | | | |
| Clinical variables: | | | | | | |
| Duration of hypertension | | | | | | |
| 6 month-1 year | 22 | 23 | 16 | 4.73 | 6 | 0.57 |
| 2-5 years | 54 | 74 | 71 | | | |
| 6-10 years | 26 | 39 | 37 | | | |
| >10 years | 9 | 12 | 17 | | | |
| Duration of treatment | | | | | | |
| <1 year | 55 | 54 | 32 | 22.96 | 6 | 0.001* |
| 2-5 years | 40 | 62 | 64 | | | |
| 6-10 years | 11 | 24 | 31 | | | |
| >10 years | 5 | 8 | 14 | | | |
| Co-morbidity of kidney diseases and diabetes mellitus | | | | | | |
| Yes | 36 | 57 | 69 | 7.40 | 2 | 0.025* |
| No | 75 | 91 | 72 | | | |
| Family history of hypertension, kidney diseases and diabetes mellitus | | | | | | |
| Yes | 51 | 97 | 107 | 24.41 | 2 | 0.000* |
| No | 60 | 51 | 34 | | | |
| Body mass index | | | | | | |
| < 18.5 Underweight | 9 | 7 | 3 | 13.65 | 6 | 0.034* |
| 18.1-24.9 Normal weight | 70 | 97 | 82 | | | |
| 25-29.9 Overweight | 26 | 43 | 48 | | | |
| 30-34.9 Class-I Obesity | 6 | 1 | 8 | | | |
| Previous Information regarding stroke | | | | | | |
| Yes | 32 | 17 | 134 | 184.37 | 2 | 0.000* |
| No | 79 | 11 | 7 | | | |

*Significant ($P$<0.05)

53.85 ± 14.81 years. About 58.8% of the hypertensive patients were male, and 41.3% were female [Table 1].

The level of stroke awareness among hypertensive patients was good, fair, and poor [Table 2]. Mean percentage distribution of domains of stroke awareness among hypertensive patients was meaning of stroke, causes and risk factors, warning signs and symptoms, diagnostic test, treatment, and prevention [Figure 1].

Awareness among hypertensive patients was found to have a significant association with age, education, occupation, income per month, social background, and it also had a significant association with duration of treatment, comorbidity, family history of hypertension, body mass index, and previous information regarding stroke [Table 3].

The finding of the present study shows the level of awareness among hypertensive patients regarding stroke. Around one-third of hypertensive patients were having awareness of one to two risk factors of stroke, three-fourth of them were having awareness regarding signs and symptoms such as loss of balance, one side body weakness, slurred speech, and visual disturbance. These results are in line with another study conducted by Khalil *et al*.[4] (2020) that showed that 68% of the participants were aware of at least one symptom, such as headache, hemiparesis, or dizziness. A total of 85.4% of the participants were aware of at least one risk factor of stroke i.e. hypertension, smoking, or stress.

The current study result revealed that 68.38% of the hypertensive patients had inadequate awareness about risk factors and causes of stroke, and 26.3% of the hypertensive patients were not aware of the sign and symptoms of a stroke. These findings are in concurrence with the study done by Chhabra *et al*.[5] (2019) who found that 28.85% of the participants were not aware of the risk factors and 46% of the participants were not knowing about warning signs of stroke.

The present study showed that 55% of the hypertensive patients were knowing about the meaning of stroke and that stroke is a disease of the brain. This conclusion was consistent with the findings of a study done by Dar *et al*.[6] that revealed that 80.5% of the participants were having knowledge about stroke, 71.6% were knowing someone with a stroke, and 76% knew that the brain is the affected organ in stroke.

The study was limited to a single institution, so the results could not be generalized. The present study concludes that hypertensive patients had poor awareness regarding causes and risk factors of stroke. The results also revealed that providing information about stroke through media, magazines, newspapers, role plays, pamphlets, information booklets, and health education to hypertensive patients will help to understand stroke and its prevention.

## Acknowledgement

I show my sincere gratitude to the study participants and well-wishers who assisted, guided, and cooperated with us directly or indirectly in the completion of the project.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

**Sunita K. Chaudhary, Ashok Kumar, Nimarta Rana, Samhita Panda[1], Naresh K. Midha[2]**

College of Nursing, [1]Departments of Neurology and [2]General Medicine, AIIMS, Jodhpur, Rajasthan, India

**Address for correspondence:** Ms. Nimarta Rana, College of Nursing, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India.
E-mail: nimartarana@gmail.com

## References

1. Johnson W, Onuma O, Owolabi M, Sachdev S. Stroke: A global response is needed. Bull World Health Organ 2016;94:634-634A.
2. Ramakrishnan S, Zachariah G, Gupta K, Rao JS, Mohanan PP, Venugopal K, *et al*. Prevalence of hypertension among Indian adults: Results from the great India blood pressure survey. Indian Heart J 2019;71:309-13.
3. Fihaya FY, Sofiatin Y, Ong PA, Sukandar H, Roesli RMA. Prevalence of Hypertension and Its Complications in Jatinangor 2014. Journal of Hypertension 2015;33: p e35.
4. Khalil HM, Lahoud N. Knowledge of stroke warning signs, risk factors, and response to stroke among lebanese older adults in Beirut. J Stroke Cerebrovasc Dis 2020;29:104716.
5. Chhabra M, Krishna S, Rashid M, Rohit, Sharma P, Sharma S, *et al*. Assessment of knowledge on risk factors, warning signs, and early treatment approaches of stroke among community adults in North India. J Neurosci Rural Pract 2019;10:417-22.
6. Dar N, Khan S, Ahmad A, Maqsood S. Awareness of stroke and health-seeking practices among hypertensive patients in a tertiary care hospital: A cross-sectional survey. Cureus 2019;11:e4774.

**Submitted:** 30-May-2021 **Revised:** 28-Sep-2021 **Accepted:** 12-Oct-2021
**Published:** 25-Apr-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**DOI:** 10.4103/aian.aian_495_21