

Original Research

Evaluating Stroke Awareness Among People with Diabetes in Kerala: A Cross-Sectional Study

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Abstract:

Background: Stroke is the fourth leading cause of death and the fifth leading cause of disability in India. Diabetes is often associated with cardiometabolic risk factors which increases the risk of stroke.

Aim: To measure the level of awareness about warning signs, risk factors, and preventive behavior that reduces the risk of stroke among people with diabetes.

Methods: A cross-sectional study was conducted in two cities in Kerala between December 2022 and May 2023. A total of 204 adults aged 18-65 years, with diabetes were enrolled. The information was collected through a questionnaire after getting their consent. For awareness and knowledge items, each correct answer was scored one point and the total summation of the discrete scores of the different items was calculated. A diabetic patient with a score less than 60% of the total score was considered to have poor awareness while a score of 60% or more of the total score was considered a good level of awareness.

Results: A total of 92 (45.1%) participants had an overall good awareness level, while 112 (54.9%) had poor awareness levels. Around 76 (37.2%) of participants had heard about stroke, 120 (58.8%) knew that stroke affects the brain. As for risk factors associated with stroke, 150 (73.5%) reported high blood pressure, followed by diabetes mellitus 130 (63.72%). About 106 (51.9%) of participants were aware of the mechanism of ischemic stroke and 84(41.1%) responded to hemorrhagic stroke. Around 150 (73.5%) opined that they could reduce their risk of stroke. People aged 50-65 years, with higher levels of education, and those with a family history of stroke, had significantly higher levels of awareness. On stroke presentation 136 (66.7%) weakness or disability to move one half of the body, followed by 118 (57.8%) on opined speech disorders.

Conclusion: This study showed more than half of people with diabetes had poor awareness regarding stroke, its risk factors, and warning signs. More Stroke awareness campaigns by healthcare professionals are recommended to prevent and decrease the overall burden of the disease.

Key words – Stroke, diabetes, awareness

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Introduction

According to the World Health Organization (WHO), diabetes mellitus is a long-term metabolic disorder characterized by high blood sugar levels. Over time, this condition can cause damage to the heart, blood vessels, eyes, kidneys, and nerves. More than 90% of diabetes cases are Type 2 Diabetes Mellitus (T2DM), a condition defined by insufficient insulin secretion from pancreatic islet β -cells, insulin resistance in body tissues, and an inadequate compensatory insulin response.[1]. A recent study reported an overall prevalence of 11.4% of diabetes and 15.3% of prediabetes in India [2].

Diabetes is a well-established yet modifiable risk factor for stroke [3, 4]. Diabetes can cause pathological changes in blood vessels which include vascular endothelial dysfunction, increased early-age arterial stiffness, systemic inflammation, and thickening of the capillary basal membrane. These changes could lead to stroke if cerebral vessels are directly affected. Moreover, uncontrolled glucose levels reported increased mortality rates and poorer post-stroke outcomes in patients with stroke [3].

A large meta-analysis reported 2.27 times increased risk of developing ischemic stroke and 1.56 times for hemorrhagic stroke in patients with diabetes [4, 5]. Knowledge and awareness of stroke and its risk factors,

and warning symptoms are essential for the prevention and treatment of stroke among high-risk individuals such as those with type 2 diabetes [4]. Stroke is the fourth leading cause of death and the fifth leading cause of disability in India [6]. Hence, the understanding of patients' knowledge of stroke and its risk factors, and symptoms has a pivotal role in designing and implementing interventions that improve help-seeking behavior and reduce pre-hospital stay [7].

However, there is lacunae of research evidence on the knowledge and awareness of stroke and its risk factors in India. Therefore, the purpose of this study is to measure the level of awareness about warning signs, risk factors, and preventive behavior that reduces the risk of stroke among people with diabetes in Kerala.

Material and Methods

A cross-sectional, observational, questionnaire-based study was conducted between December 2022 and May 2023 in Kerala, India. Adults with diabetes who visited for consultation were invited to participate in the study.

For awareness and knowledge items, each correct answer was given a score of one point, and the total summation of the discrete scores of the different items was calculated. A diabetic patient with a score less than 60% of the total score was considered to have poor awareness while a score of 60% or more of the total score was considered a good level of awareness. The participants were asked to respond to the questionnaire after providing their consent. The responses were digitally analyzed, and descriptive analysis was conducted to present data in numbers and percentages.

Results

A total of 204 adult patients with diabetes participated in the study. The majority of them were between 50-65 years (53.92%) and female (54.90%). Almost half of the study participants had an educational above primary to higher secondary school and 25.49% of participants had family members who have or had a stroke. The baseline characteristics of the study participants is provided in **Table 1**.

Table 1: Baseline Characteristics

Characteristics	Number (%) N=204
Age in years	
18-35 years	32 (16.32)
36-49 years	62 (30.39)
50-65 years	110 (53.92)
Gender	
Male	92 (45.09)
Female	112 (54.90)
Marital status	
Single	10 (4.90)
Married	194 (95.09)
Educational Level	
Up to Primary	22 (10.78)
Above primary to higher secondary school	114 (55.88)
University or above	68 (33.33)
Occupation	
Skilled/unskilled	122 (59.80)
Homemaker	46 (22.54)
Unemployed/retired	36 (17.64)
Medical and Family History	
Comorbidities	
Hypertension	148 (72.54)
Hypercholesterolemia	112 (54.90)
Cardiovascular disease	30 (14.70)
Smoking for more than 1 year	70 (34.31)
Do you have anyone in your family who has or had a stroke	
Yes	52 (25.49)
No	152 (74.50)

A total of 92 (45.1%) participants had an overall good awareness level, while 112 (54.9%) had poor awareness levels. Around 76 (37.2%) of participants had heard about stroke, and 120 (58.8%) knew that stroke affects

the brain. Information from health care staff and the Internet was considered the preferred source of information regarding stroke awareness (**Figure 1**)

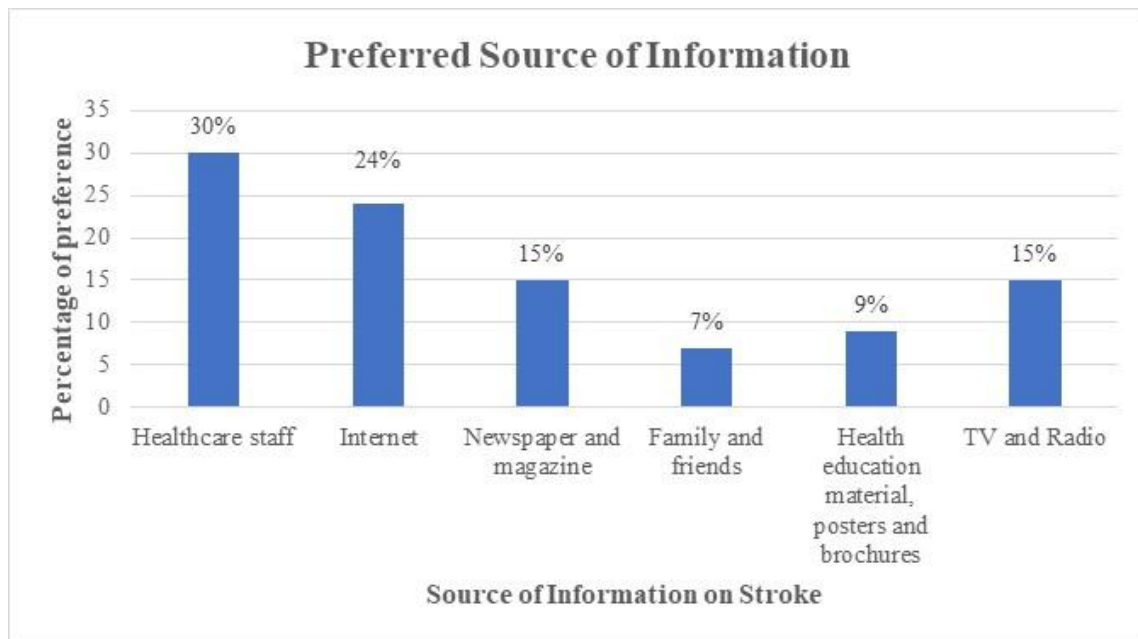


Figure 1: Preferred Source of Information on Stroke

Amongst awareness of risk factors for stroke, 150 (73.5%) of participants opted for high blood pressure and 130 (63.72%) of participants opted for diabetes mellitus. A total of 106 (51.9%) of participants were aware of the mechanism of ischemic stroke and 84 (41.1%) were aware of the mechanism of hemorrhagic stroke. On awareness stroke presentation of stroke, 136 (66.7%) of participants opted for weakness or disability to move one half of the body, followed by 116 (57.8%) of participants who opined speech disorders. Around 150 (73.5%) opined that they could reduce their risk of stroke. Participants aged 50-65 years, with a higher level of education, and those with a family history of stroke had higher levels of awareness of stroke.

Discussion

This study evaluated the awareness among diabetes patients in Kerala regarding stroke warning signs, risk factors, and preventive behaviors that can help reduce the risk of stroke in individuals with diabetes. The study found that less than half of the participants (45.1%) had a good overall level of awareness about stroke, and only 37.2% of them had previously heard of the condition.

A study conducted in Nigeria reported that 70.3% of participants with diabetes and hypertension had good knowledge of stroke [8]. In contrast, a study by Elshebiny et al. among diabetes patients in Saudi Arabia found that 43.1% of participants had a good overall level of stroke awareness [9]. Formal education

was identified as the only predictor of good knowledge regarding the signs and symptoms of stroke. In the current study, 33.33% of participants had a 'University and above' level of education, while 55.88% had an education level ranging from 'above primary to higher secondary school.'

A study by Alhazzani et al reported that the participants identified hypertension (55.8%), dyslipidemia (45.8%) and smoking (44.3%) as risk factors for stroke [10]. The participants in our study have identified hypertension and diabetes as the important risk factors for stroke. A similar observation was reported by Elshebiny et al, in which 73.1% and 69.3% of participants opted for high blood pressure and diabetes mellitus, respectively, as the important risk factor for stroke [9].

The most frequently cited sources of knowledge about stroke among Americans were mass media such as television (32%), magazines (24%), and newspapers (22%). Other sources of information were physicians, family members with stroke, medical books, and information from friends who were stroke survivors. The French, Indians, and Australians reported that the preferred sources of knowledge from print and electronic media were superior rather than professionals (physicians, pharmacists, or hospital information) [12-15]. Observations from Pandian et al and Das et al showed that the role of healthcare personnel in delivering such knowledge in Indian society remains unsatisfactory [13,14]. However, participants in the

current study reported that healthcare personnel as the major source of information on stroke.

Conclusion

The findings from the current study showed that less than half of the participants had a good awareness level about stroke, its related risk factors, and symptoms. More stroke awareness campaigns by healthcare professionals are recommended to prevent and decrease the overall burden of the disease.

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