

ORIGINAL RESEARCH

Unveiling the enigmatic factors: Decoding the intricacies of stroke risk

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Received: 12 January, 2023

Accepted: 15 February, 2023

ABSTRACT

Background: A stroke occurs when the blood supply to a part of the brain is interrupted, either by a blockage or the rupture of a blood vessel. The lack of blood flow to the brain can cause brain cells to be deprived of oxygen and nutrients, leading to their damage or death. Stroke is defined as a neurological deficit attributed to an acute focal injury of the CNS (ie, brain, retina, or spinal cord) by a vascular cause. Most strokes are ischaemic due to reduced blood flow, generally resulting from arterial occlusion. A rarer type of ischaemic stroke is venous infarction due to occlusion of cerebral veins or venous sinuses. **Aim:** The present study was conducted to assess risk factors of stroke. **Materials & Methods:** 72 cases of stroke of both genders were subjected to CT, magnetic resonance imaging (MRI), carotid Doppler and CT angiography. Risk factors and clinical features were recorded. **Results:** Out of 72 cases, males were 40 and females were 32. Common risk factors observed were hypertension in 65, alcoholism in 23, smoking in 45, obesity in 22, past CVD in 13, family history of stroke in 10, dyslipidaemia in 36 and diabetes in 52 patients. Clinical features were hemiplegia/hemiparesis in 62, seizures in 40, gait abnormalities in 35, cranial nerve involvement in 28 and speech disturbances in 17. Arteries involved were middle cerebral artery in 32, anterior cerebral artery in 26 and posterior cerebral artery in 14. The difference was significant ($P < 0.05$). **Conclusion:** Common risk factors observed were hypertension, alcoholism, smoking, obesity, past CVD, family history of stroke, dyslipidaemia and diabetes.

Key words: hypertension, alcoholism, stroke

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INTRODUCTION

A stroke occurs when the blood supply to a part of the brain is interrupted, either by a blockage or the rupture of a blood vessel.¹ The lack of blood flow to the brain can cause brain cells to be deprived of oxygen and nutrients, leading to their damage or death. Stroke is defined as a neurological deficit attributed to an acute focal injury of the CNS (ie, brain, retina, or spinal cord) by a vascular cause. Most strokes are ischaemic due to reduced blood flow, generally resulting from arterial occlusion. A rarer type of ischaemic stroke is venous infarction due to occlusion of cerebral veins or venous sinuses.²

There are several types of strokes, the two main types being ischemic stroke and hemorrhagic stroke. Ischemic stroke is the most common type of stroke, accounting for about 85% of all cases. It occurs when a blood vessel supplying the brain is blocked or narrowed, leading to a decrease or complete cessation of blood flow to a specific area of the brain.³ The

blockage is usually caused by a blood clot (thrombus) that forms within the blood vessel or by a clot that travels from another part of the body (embolus). Ischemic strokes can also occur due to other conditions, such as severe stenosis (narrowing) of the arteries supplying the brain. Hemorrhagic stroke occurs when there is bleeding within the brain or in the spaces surrounding the brain. Hemorrhagic strokes account for about 15% of all strokes but tend to be more severe and have a higher risk of complications.⁴ Strokes are medical emergencies and require prompt treatment to minimize potential brain damage and improve the chances of recovery.⁵

AIM

The present study was conducted to assess risk factors of stroke.

MATERIALS & METHODS

This study was conducted between March 2021 and February 2022 in the Department of Neurosurgery at Rama Medical College and Research Centre in Kanpur, Uttar Pradesh, India. The present study consisted of 72 cases of stroke of both genders. All gave their written consent to participate in the study. Data such as name, age, gender etc. was recorded. In all cases, CT, magnetic resonance imaging (MRI), carotid Doppler, CT angiography where carotid

Doppler was inconclusive, electrocardiogram, transthoracic echocardiography, transesophageal echocardiography of the brain was performed. Risk factors such as smoking, alcoholism, diabetes, hypertension, obesity, dyslipidaemia, past CVD, family history of stroke etc. was recorded. Clinical features were also recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

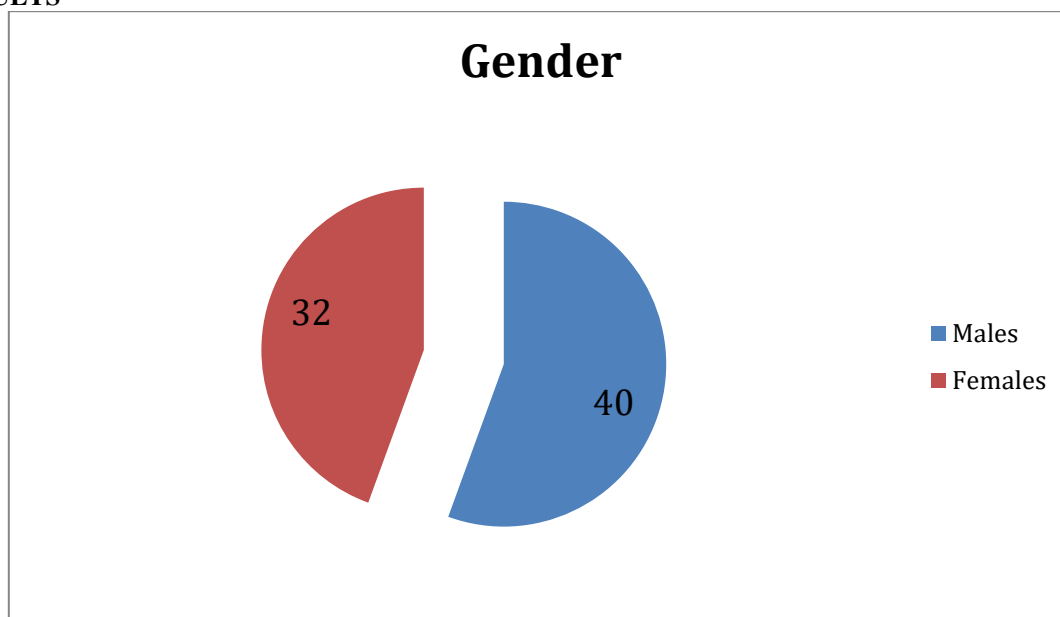


Table I Distribution of patients

Total- 72		
Gender	Male	Female
Number	40	32

Table I shows that out of 72 cases, males were 40 and females were 32.

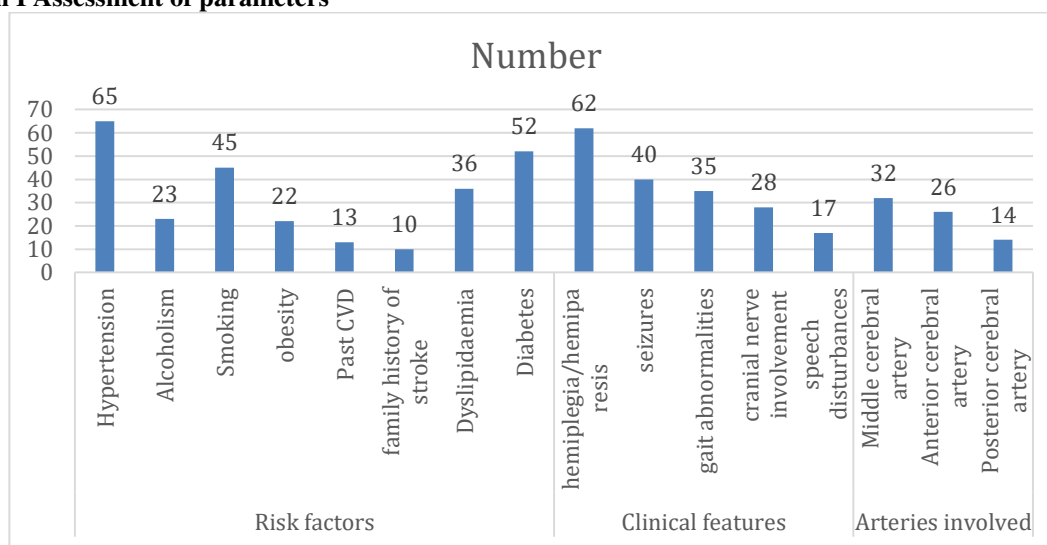
Table II Assessment of parameters

Parameters	Variables	Number	P value
Risk factors	Hypertension	65	0.01
	Alcoholism	23	
	Smoking	45	
	obesity	22	
	Past CVD	13	
	family history of stroke	10	
	Dyslipidaemia	36	
	Diabetes	52	
Clinical features	hemiplegia/hemiparesis	62	0.04
	seizures	40	
	gait abnormalities	35	
	cranial nerve involvement	28	
	speech disturbances	17	
Arteries involved	Middle cerebral artery	32	0.05
	Anterior cerebral artery	26	
	Posterior cerebral artery	14	

Table II, graph I shows that common risk factors observed were hypertension in 65, alcoholism in 23, smoking in 45, obesity in 22, past CVD in 13, family history of stroke in 10, dyslipidaemia in 36 and diabetes in 52

patients. Clinical features were hemiplegia/hemiparesis in 62, seizures in 40, gait abnormalities in 35, cranial nerve involvement in 28 and speech disturbances in 17. Arteries involved were middle cerebral artery in 32, anterior cerebral artery in 26 and posterior cerebral artery in 14. The difference was significant ($P < 0.05$).

Graph I Assessment of parameters



DISCUSSION

The annual incidence of thromboembolic stroke in the United States is approximately 150/100,000 adults.⁶ An estimated 80% of patients will survive the acute event. Of those, 50% survive the first year and can thereafter expect their survival rate to approach that of the unaffected population.⁷ However, the chance of significant residual morbidity is substantial. Fifty percent of those with an anterior circulation occlusion and 13% of those with a posterior circulation occlusion will not regain the ability to function independently.⁸ The present study was conducted to assess risk factors of stroke.

We found that out of 72 cases, males were 40 and females were 32. Kivioja R et al⁹ conducted a study on 961 stroke patients and 1403 healthy subjects and found that the significant risk factors for ischaemic stroke was atrial fibrillation, cardiovascular disease, type 1 diabetes mellitus, type 2 diabetes mellitus, low high-density lipoprotein cholesterol, current smoking status, hypertension, and a family history of stroke. High low-density lipoprotein cholesterol exhibited an inverse association with IS.

We found that common risk factors observed were hypertension in 65, alcoholism in 23, smoking in 45, obesity in 22, past CVD in 13, family history of stroke in 10, dyslipidaemia in 36 and diabetes in 52 patients. Clinical features were hemiplegia/hemiparesis in 62, seizures in 40, gait abnormalities in 35, cranial nerve involvement in 28 and speech disturbances in 17. Arteries involved were middle cerebral artery in 32, anterior cerebral artery in 26 and posterior cerebral artery in 14. Shekhawat et al¹⁰ assessed cases of stroke in adult population.: 102 patients of stroke of with neurological examination was done. All were subjected to computed tomography (CT) scan and magnetic resonance imaging (MRI). Risk factors were

hypertension in 78, diabetes mellitus in 64, dyslipidemia in 60, valvular heart disease in 34, CKD in 15, atrial fibrillation in 31 and smoking in 75 patients. Left anterior cerebral artery was involved in 42 patients, left middle cerebral artery in 20, right anterior cerebral artery in 28 and right middle cerebral artery in 12 patients. Zafar et al¹¹ included 145 patients who presented with radiological confirmed neurological deficits consistent with ischemic stroke. Among the 145 patients diagnosed with ischemic stroke, there were 54.1% males and 45.9% females with a mean age of 65 ± 14 years. Nearly 62.7% patients had hypertension (HTN) as the most common risk factor, followed by 38.6% diabetes mellitus (DM), 27.5% heart failure, 19.3% valvular disease, 18.6% previous stroke, 16.4% smoking, 15.1% dyslipidemia, 13.7% ischemic heart disease, and 13.1% atrial fibrillation. HTN was significantly associated with large vessel disease ($P = 0.028$). DM was significantly associated with small vessel disease ($P = 0.001$). Smoking and atrial fibrillation both were associated with unknown etiology of stroke ($P = 0.001$ and $P = 0.039$, respectively). Most common etiology of stroke was cardioembolism (40%), and atrial fibrillation is found to be the most common cause of cardioembolic stroke with 30.6% incidence.

CONCLUSION

In conclusion, this study aimed to assess the risk factors associated with stroke. The findings revealed that common risk factors observed among the 72 cases included hypertension, alcoholism, smoking, obesity, past cardiovascular disease, family history of stroke, dyslipidemia, and diabetes. Clinical features such as hemiplegia/hemiparesis, seizures, gait abnormalities, cranial nerve involvement, and speech disturbances were also recorded. Additionally, the study identified

the involvement of specific arteries, including the middle cerebral artery, anterior cerebral artery, and posterior cerebral artery. The results align with previous research highlighting the significance of risk factors such as atrial fibrillation, cardiovascular disease, diabetes, dyslipidemia, and smoking in contributing to ischemic stroke. Understanding and addressing these risk factors can play a crucial role in stroke prevention and management. Further research and interventions focused on these factors can potentially help reduce the burden of stroke and improve patient outcomes.

LIMITATION

One of the limitations of this study is the small sample size, consisting of only 72 cases. With a limited number of participants, the findings may not fully represent the entire population and could affect the generalizability of the results. A larger sample size would provide more robust and reliable data, allowing for better statistical analysis and drawing more accurate conclusions. Future studies with a larger sample size could help validate and strengthen the findings obtained in this study, providing a more comprehensive understanding of the risk factors associated with stroke.

SOURCE OF SUPPORT

The author of this study did not and will not receive benefits in any form from a commercial party related directly or indirectly to the content of this study.

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