

Research Article

Clinico-epidemiological study of acute ischemic stroke in a tertiary hospital of northeastern state of India

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Abstract

Introduction: Acute ischemic stroke, a subtype of acute stroke is one of the leading causes of death and major cause of morbidity and mortality throughout the world. The incidence of acute ischemic stroke is increasing with gradual increase in obesity, diabetes mellitus, hyperlipidemia, hypertension and some other cardiac problem.

Objective: The study has been conducted with a primary objective to study the epidemiology and clinical presentation of acute ischemic stroke.

Methods: This cross sectional study was carried out among 100 acute ischemic stroke patients (clinically and radiologically confirmed) irrespective of age and sex admitted to Medicine and Emergency Department of Regional Institute of Medical Sciences (RIMS), Imphal after getting clearance from Institutional Ethical Committee (IEC). The acute ischemic stroke patients were also undergone plane CT (computed tomography) scan brain by the CT scan model Philips Brilliance 64 slice CT for radiological confirmation and to localize the lesion in brain. Data, collected in prescribed protocol, were analyzed in simple statistical percentage.

Result: Acute ischemic stroke was found most commonly in 50-75 age group with male predominance. Majority of the acute stroke patients were smoker, non-vegetarian and hypertensive. The commonest clinical feature at presentation was hemiplegia. Rightsided hemiplegia was the predominant finding in acute stroke patients. Left hemisphere brain infarction was more common than right hemisphere lesion in brain.

Conclusion: In this study, the epidemiology, clinical presentation and various risk factors of acute ischemic stroke have been focused, by targeting which the burden of this disabling disease can be prevented.

Keywords: Acute ischemic stroke, epidemiology, hemiplegia

1. Introduction

Stroke or cerebro-vascular accident is a leading cause of mortality and morbidity throughout the world including both developed and developing countries. In country like India, the cases are also increasing with gradual increase in obesity, diabetes mellitus, hyperlipidemia, hypertension and some other cardiac problem. The incidence of stroke increases with age and the number of stroke is projected to increase as the elderly population grows. Stroke is a medical emergency and need urgent diagnosis and treatment¹.

Stroke is defined by the abrupt onset of a neurological deficit that is attributable to a focal vascular cause. The

clinical manifestations of stroke are highly variable because of the complex anatomy of the brain and its vasculature. Stroke may be broadly classified into ischemic and hemorrhagic stroke. Ischemic stroke occurs due to loss of blood supply to part of brain initiating ischemic cascade due to free radical production and damage to endothelial lining. At present, diagnosis of stroke is mostly based on CT scan (Computer Tomography) or Magnetic Resonance Imaging¹. Studies had been conducted on the epidemiology and risk factors of acute stroke in various parts of world including India. The present study has been conducted in a tertiary care hospital of northeastern region of India with a primary objective to view the clinical presentation and epidemiology of acute ischemic stroke in this population of northeastern region of India.

2. Materials and Method

This cross-sectional study had been conducted in Department of Medicine in collaboration with the Department of Emergency Medicine and Radiodiagnosis, RIMS Imphal, India from March 2010 to March 2012. A total of 100 acute ischemic stroke patients (clinically and radiologically confirmed) admitted in OPD/Ward/Emergency had been taken irrespective of sex and age in the present study. Exclusion criteria were patients dying before recording the information, patients refusing to give consent to take part under the study.

2.1 Sample size: A total of 100 acute ischemic stroke patients irrespective of age and sex.

2.2 Study tool and data collection: A pre designed semi-structural proforma, designed for the purpose was used as a study tool. A proforma of all the acute ischemic stroke patients had been maintained where in a brief clinical information including particulars of the subjects, chief complaints, family, menstrual, personal, dietary history, past history were taken. Proper general physical examination and systemic examination were also done and recorded in the proforma. The acute ischemic stroke patients were subjected to plane CT scan brain in the Department of Radio-diagnosis, RIMS by using CT scan model Philips Brilliance 64 slice CT with Advanced Brilliance 3D Workstation to confirm the diagnosis and also for localizing the site of lesion.

2.3 Statistical analysis: The collected data are processed through simple statistical method like percentage.

2.4 Ethical issue: This study was conducted only after getting approval from Institutional Ethical Committee, RIMS, Imphal. Informed consent from the participating individual was also obtained. Confidentiality was maintained by masking the identity and identifiers of the participants.

3. Results

The present study is based on the primary data of 100 acute ischemic stroke patients irrespective of sex and age. In the present study, majority of acute ischemic stroke patients were male(57%) whereas maximum number of acute ischemic stroke patients(56%) was in age group (50-75) years followed by 25-50 age group(30%).Majority of the acute ischemic stroke patients were Hindus (53%) and married(83%) as shown in table 1.

Table 1: Distribution of acute ischemic stroke patients based on socio-cultural parameters

Parameters		Number of cases	Percentage
Sex	Male	57	57%*
	Female	43	43%
Age	0- 25	0	0%
	25-50	30	30%
	50-75 yrs.	56	56%*
	>75 yrs	14	14%
Religion	Hindu	53	53%
	Christian	20	20%
	Muslim	27	27%
Marital status	Married	83	83%
	Unmarried	17	17%
Total (n)		100	100.00

Analysis of the risk factors of acute ischemic stroke revealed that majority of acute stroke patients were hypertensive(68%) and other risk factors also include smoking(60%), non-veg diet(76%), diabetes mellitus(37%) (Table-2).

Table 2: Risk factors of acute ischemic stroke

Risk factors of Acute ischemic stroke	Percentage
Hypertension	68%*
Smoking	60%*
Non-veg diet	76%*
Diabetes mellitus	37%

In the present study, majority of the acute ischemic stroke patients present with hemiparesis followed by dysarthria(60%) , motor dysphasia(59%). 54% of the patients presented with loss of consciousness whereas headache and vomiting was present in 44% and 40% of the patients respectively(table 3).

Table 3: Clinical presentations of acute ischemic stroke patients

Clinical presentation of acute ischemic stroke (n=100)		Percentage	
Hemiparesis/ Hemiplegia	Right side	48%	80%*
	Left side	32%	
Dysarthria		60%	
Motor dysphasia		59%	
Sensory dysphasia		1%	
Impaired consciousness		54%	
Headache		44%	
Vomiting		40%	
Nystagmus		4%	

In this study, majority of the subjects (52%) presented with grade 2 level of unconsciousness (table 4).

Table 4: Level of consciousness of acute ischemic stroke patients at presentation.

Subjects	Grade1 Glasgow Coma Scale(GCS)13-15	Grade 2 (GCS 9-12)	Grade 3 (GCS 4-8)	Grade 4 (GCS 3)
Acute ischemic stroke patients (n=100)	46(46%)	52(52%)*	2(2%)	0(0%)

In the present study, maximum (56%) number of acute stroke patients had left hemispheric brain lesion, whereas cerebral cortex was effected by acute ischemic stroke in majority (59%) of the patients (table 5).

Table 5: Distribution of acute ischemic stroke patients based on the side and site of the lesion in brain

Side of lesion	Acute ischemic stroke patients(n=100)	Site of Lesion	Acute ischemic stroke patients(n=100)
Left hemisphere	56%	Cortical (cerebral cotex)	59%*
		Internal capsule	12%
		Basal ganglia	6%
		Insula	4%
Right hemisphere	44%	Thalamus	8%
		Cerebellum	8%
		Multifocal	3%

4. Discussion

In the present study, the role of non-modifiable risk factors like age and sex in acute ischemic stroke were studied and a small male predominance among stroke patients has been found, which is supported by other studies^{2,3,4}. The higher male preponderance in this study may be due to the fact, that women are neglected part of the society and they are not brought to hospital, if not otherwise seriously ill. Besides, smoking which is a risk factor for acute ischemic stroke is more common in men. In this study it is seen that in ischemic stroke patients majority of the sufferers were in the 50-75 age group followed by age group > 75 yrs. So it clear from this study that acute ischemic stroke occurs more commonly in elderly. In the present study, majority of acute ischemic stroke patients were Hindus(53%) and married(83%), which may be because of regional socio-cultural variation.

In this study hypertension(68%) emerges as the most important risk factor in acute ischemic stroke. The result correlates with that of other studies where hypertension was found to be the most important risk factor^{3,5,6}. Smoking(60%) appears as second important risk factor of ischemia stroke in this study, which correlates with Donnan *et al*⁷, who found smoking as a strong risk factor for SAH and cerebral infarction. John W Cole *et al*⁸ demonstrated that cigarette smoking may modulate stroke risk through a gene-environment interaction. V. M Bhat⁹ and Md Jalal Uddin *et al*¹⁰ also suggested a strong relationship between cigarette smoking and causation of acute ischemic stroke. In the present study, non-vegetarian constitutes maximum of the acute ischemic stroke patients (76%). Studies done by Joshipura *et al*¹¹ and SP Josephson *et al*¹² shows the protective response of fruits and vegetables in causation of ischemic stroke. Diabetes mellitus has long been recognized as a risk factor for vascular disease and it doubles the risk of stroke compared with non-diabetics¹³. In this study diabetes(37%) appears to be associated with stroke, which correlates with the Framingham study¹⁴.

In the current study, commonest neurological deficit in acute ischemic stroke was hemiparesis(80%), followed by dysarthria (60%), motor dysphasia (59%). However, various grades of weakness were not brought into consideration in this study. This result correlates with few studies where hemiplegia was also found to be the commonest presentation^{5,14,15}. In this study, impaired consciousness (54%) was found in many cases of acute ischemic stroke, which also correlates with other studies^{2,5}. Majority (52%) of the acute stroke patients were having grade-2 Glasgow Coma Scale(GCS) at presentation. Similar finding has been observed by Siddique AN *et al*⁵. In this study left hemispheric lesion of brain constitutes majority (56%) of the acute ischemic stroke patients. H Ito *et al*¹⁶ in their study on the side of lesion in stroke also observed similar results. Cerebral cortex (59%) was the most site of lesion in the acute stroke patients, which is supported by the findings of Siddique AN⁵.

5. Conclusion

Acute ischemic stroke, being one of the most common cerebrovascular diseases, has drawn attention of researchers all over the world. For better understanding of the pathogenesis and therapeutics of acute ischemic stroke, clinico-epidemiological aspects and risk factors associated with ischemic stroke remains important as ever. The burden of this disabling disease can be prevented by targeting the various risk factors of the acute ischemic stroke.

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