

Study of Cerebrovascular Accident in Relation to Clinical Correlation with Findings of CT Scan Brain

Rekha NH.¹, Vidyashree J.²

Abstract

WHO defined stroke as “rapidly developing clinical symptoms and or signs of focal and at times global loss of brain function with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin”. Stroke is considered to be second commonest cause of death worldwide. CT imaging of the brain is the standard and plays a major role in CVA, to assess the site, size and nature of the lesion. Though MRI is superior to CT scan, the higher cost of MRI and easy availability of CT scan brain makes CT the commonest investigation in diagnosis and treatment of stroke. *Aims and Objectives* : 1. To correlate the nature of lesion based on the clinical grounds and CT scan brain findings. 2. To correlate the site and size of lesion based on the clinical grounds and CT scan brain findings. *Material and Methods*: This study was done in the department of General Medicine at Rajarajeswari Medical College and Hospital. Fifty patients presenting with Acute stroke (according to WHO definition) admitted to medical wards were considered for the study for a duration of one year. This was a cross sectional study. *Results*: Out of 50 cases studied, 17 (34%) patients had hemorrhagic stroke and 33 (66%) patients had ischemic stroke. Out of 50 cases studied, 33 patients had ischemic stroke clinically, but 29 patients had ischemic changes on CT scan brain. 17 patients had haemorrhagic stroke clinically but 16 had haemorrhage on CT scan brain. 5 patients had stroke clinically, but CT scan brain was normal in them. Out of 50 cases 8 (16%) had altered sensorium, 14 (28%) had speech defect, 43 (86%) had hemiplegia, 10 (20%) had headache, 2 (4%) had seizures, 12 (24%) had facial nerve palsy, 1 (2%) had cerebellar signs and 6 (12%) had brain stem signs.

Keywords: Stroke, Infarct; Cerebral Haemorrhage.

How to cite this article:

Rekha NH., Vidyashree J. Study of Cerebrovascular Accident in Relation to Clinical Correlation with Findings of Ct Scan Brain. Int J Neurol Neurosurg. 2019;11(1):67-70.

Introduction

WHO defined stroke as “rapidly developing clinical symptoms and or signs of focal and at times global loss of brain function with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin” [1].

Stroke is considered to be second commonest cause of death worldwide [2]. It is the commonest cause of neurological disability in the developed world and it causes secondary medical problems including dementia, depression, epilepsy, falls and fractures [3]. The incidence of stroke increases with age. Thus, the disability affects more people in their “golden years”.

Worldwide, about 20 million people suffer from stroke each year. 5 million people die as a consequence of those who survive, 5 million will be disabled by their stroke. The global burden of disease (GBD) study, in 1990, reported 9.4 million deaths in India of which 61900 were from stroke [4].

Various diagnostic modalities have been applied in evaluation of stroke. Early diagnosis and

Author's Affiliation: ¹Professor, ²Post Graduate Student, Department of General Medicine, Rajarajeswari Medical College and Hospital, Bangalore, Karnataka 560074, India.

Corresponding Author: Rekha NH., Professor, Department of General Medicine, Rajarajeswari Medical College and Hospital, Bangalore, Karnataka 560074, India.

E-mail: drrekhanh@gmail.com

Received on 31.10.2018, **Accepted on** 03.12.2018

treatment is necessary to prevent mortality and morbidity. Though there are many investigations, computed tomography (CT) and magnetic resonance imaging (MRI) play major role in the diagnosis of CVA [5].

CT imaging of the brain is the standard and plays a major role in CVA. To assess the site, size and nature of the lesion [6]. Though MRI is superior to CT scan, the higher cost of MRI and easy availability of CT scan brain makes CT the commonest investigation in diagnosis and treatment of stroke [7]. CT scan also enables us to diagnose the type of infarct and to differentiate between infarct and haemorrhage [8].

Aims and Objectives

1. To correlate the nature of lesion based on the clinical grounds and CT scan brain findings. 2. To correlate the site and size of lesion based on the clinical grounds and CT scan brain findings.

Material and Methods

This study was done in the department of General Medicine at Rajarajeswari Medical College and Hospital. Fifty patients presenting with Acute stroke (according to WHO definition) admitted to medical wards were considered for the study for a duration of one year. This was a cross sectional study.

Inclusion Criteria

The study group consists of patients above 18yrs, admitted to medical wards with clinical diagnosis of Acute stroke (according to WHO definition).

Exclusion Criteria

1. Patients less than 18 years of age. 2. Patients with history suggestive of CNS infections, Epilepsy with post ictal phase, Hypoglycemia, Hyponatremia, TIA, Multiple sclerosis, Demyelinating disorders, Complicated migraine, Conversion disorder/ psychogenic stroke. Patients with brain tumors, head injury. Patients in whom CT scan could not be obtained. Patients with previous stroke.

Methods of Collection of Data

The patients who were admitted to Rajarajeswari Medical College and Hospital, Bengaluru with the diagnosis of Acute stroke were considered for the study. Written informed consent was obtained from all the patients before their enrolment into the

study.

Detailed clinical history was taken from patients and from bystanders as per the proforma.

All the patients were subjected to thorough clinical examination at admission. All patients were subjected to CT scan brain.

Following necessary investigations were performed:

Complete hemogram, Blood urea, serum creatinine, FBS/ PPBS, Urine albumin, sugar, urine microscopy, Chest X-ray PA view, ECG in all leads, 2D Echocardiography, CT scan brain, Perimetry and Special investigations like MRI brain, MRA and MRV.

Statistics

Data collected were analysed statistically using descriptive statistics, namely mean and standard deviation. The results are depicted in the form of percentages and graphs.

Results and Observations

A total number of 50 cases of cerebrovascular accidents admitted to RajaRajeswari Medical College and Hospital, Bengaluru who met the inclusion criteria were studied. Their age ranged from 20 to 85 years with mean age of 55.2 years. These patients were divided into five age groups. Maximum incidence was seen in the age group between 50-60 years. Out of 50 cases studied, 24 (48%) were males and 26 (52%) were females. The ratio of males to female was 0.9:1. Out of 50 cases studied, 17 (34%) patients had hemorrhagic stroke and 33 (66%) patients had ischemic stroke. Out of 17 cases with haemorrhagic stroke, none had CAD, 2 patients had DM, 13 patients had HTN, 2 patients had history of smoking. Out of 33 cases of ischemic stroke 4 patients had CAD, 16 patients had DM, 7 patients had HTN, 6 patients had history of smoking. Out of 50 cases 37 (74%) patients had normal lipid profile and 13 (26%) patients had hyperlipidaemia which was judged by serum cholesterol value >180 mg/dl. Out of 50 cases 27 (54%) had normal ECG findings, 13 (26%) had LVH strain, 10 (20%) had non-specific (ST-T) changes.

Out of 50 cases 8 (16%) had altered sensorium, 14 (28%) had speech defect, 43 (86%) had hemiplegia, 10 (20%) had headache, 2 (4%) had seizures, 12 (24%) had facial nerve palsy, 1 (2%) had cerebellar signs and 6 (12%) had brain stem signs.

Table 1: Nature of lesion

Nature of lesion	Clinical	CT brain
Infarct	33	29
Haemorrhage	17	16
Normal	-	5
Total	50	50

Out of 50 cases studied, 33 patients had ischemic stroke clinically, but 29 patients had ischemic changes on CT scan brain. 17 patients had haemorrhagic stroke clinically but 16 had haemorrhage on CT scan brain. 5 patients had stroke clinically but CT scan brain was normal in them.(Table 1, Fig. 1.)

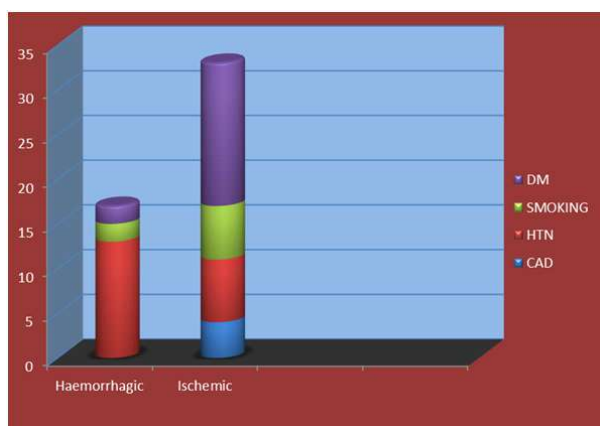


Fig. 1:

Table 2: Topographical distribution

Lobes	Frequency	Percent (%)
Frontal lobe	7	14
Parietal lobe	6	12
Capsule-ganglionic	30	60
Occipital	1	2
Brain stem	6	12
Total	50	100

Out of 50 cases studied 7(14%) patients had lesion in the frontal lobe, 6(12%) had in parietal lobe, 30(60%) had in capsule-ganglionic, 1(2%) in occipital lobe, 6(12%) in brain stem.(Table 2, Fig 2).

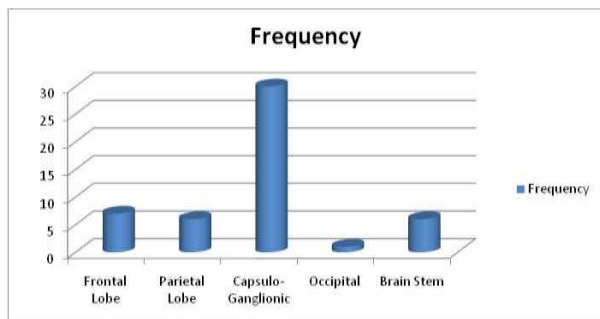


Fig. 2:

Table 3: Vascular territory involvement

Vascular involvement	Frequency	Percent (%)
ACA	6	16
MCA - Right	20	40
Left	16	32
PCA	8	12
Total	50	100

Out of 50 cases studied 6(16%) patients had ACA territory involvement, 36(72%) patients had involvement of MCA and 8(12%) had PCA territory involvement. (Table 3, Fig. 3)

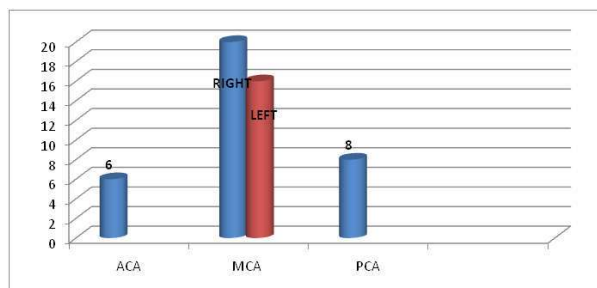


Fig. 3:

Discussion

We conducted a cross sectional study in 50 patients with stroke in Rajarajeswari Medical College and Hospital between August 2014 and December 2015 is discussed and compared to other studies.

1. *Age and Sex:* In the present study, age of the patients ranged from 20 to 85 years with mean age of 55.2 years, and maximum patients belonged to age group 50-60 years (38%), Rawal Divyant et al., in his study found that maximum patients belonged to age group 51-60 years (39.2%) with mean age of 58±10.2 years. RP Eapen et al., in his study found that maximum patients belonged to the age group 51-60 years with mean age of 54.85 years.5The present study is closely correlates to other two studies. In our study, we observed that stroke incidence was more in males among age group 50-60 years and in females aged >60years.

In the present study we noted that hemiplegia was the most common clinical presentation comprising of 86% of total cases. This finding closely correlates with other studies done by Rawal D et al., (58.6%) and Patne SV et al., (55.28%).

In our study speech defects was observed in 28% patients and this closely correlates with Rawal D et al., (33.6%). Headache was found in 20% patients in our study, this closely correlated with Rawal D

et al., (12.9%) [9]. Altered sensorium was found in 16% of patients in our study, this closely correlated with study done by Patne SV et al., (9.75%). 10.4% patients presented with seizures in our study and this closely correlates with Patne SV et al., (4.87%). About 24% patients had facial nerve palsy and 12% had brain stem signs in our study. This finding was not found in other 2 studies. We also found cerebellar signs in 2% patients which is not comparable with other studies. In our study, hypertension was found as the most common risk factor which comprised of 50%. This closely correlates with Rawal D et al., (57.1%) and Patne SV et al., (48.78%). Hypertension was found to be the major risk factor in haemorrhagic stroke in our study. Diabetes mellitus was found in 19% patients and was found to be the major risk factor in ischemic stroke. Which is slightly more than Patne SV et al., who found diabetes in 14.63% patients and was major risk factor in ischemic stroke in present study. Smoking was found in 16% patients which is less when compared to other 2 studies Rawal D et al., (29.3%) and Patne SV et al., (19.51%). In our study CAD was found in 8% patients which closely correlates with Patne SV et al., (8.13%). Hyperlipidemia was found in 26% patients which closely correlates with Rawal D et al., 27.1%).

In present study we found that patients who had smoking history 6 were males, and they all had ischemic stroke. None of our patients had past history of CVA and valvular heart disease. In present study we found ischemic stroke clinically in 66% patients and 58% was confirmed by CT scan brain and clinical to CT scan brain correlation was 87.8%. This closely correlates with Hussain et al., where 80.9% patient had ischemic stroke clinically and 67% was confirmed by CT scan brain and clinical to CT scan brain correlation was 83%.

In our study we found haemorrhagic stroke in 34% patients clinically, 32% were confirmed by CT scan brain and clinical to CT correlation was 94.2%. this finding was not comparable with the study done by Hussain et al., where he found haemorrhagic stroke in 19.1% patients clinically and only 9.09% had haemorrhage on CT scan brain and clinical to CT scan brain correlation was 47.6%.

In our study we found that 10% patients who had stroke clinically had normal CT scan brain.

Topographic Distribution: In our study most commonly involved site was capsuloganglionic area (60%), followed by frontal lobe (14%)

and parietal lobe (12%). This was not comparable with other studies. We also observed brain stem involvement in 12% patients.

Conclusion

It was concluded from the study that stroke was more common among the age group 50-60 years with female predominance. Hypertension has been found as the most common risk factor. Cerebral infarction was more common than hemorrhage and MCA territory was commonly involved. Localization of stroke on clinical basis is not always easy and confident diagnosis requires detailed case history, extensive neurological examination and focal neurological deficit of a particular area. Early diagnosis and followed by confirmation by CT scan brain can reduce mortality and morbidity in stroke patients.

References

1. Hantano S. experience multi-centre stroke register. A preliminary report bulletin. WHO. 1976;54:541-53.
2. The Brain: An Introduction to Functional Neuroanatomy. 1st Edition. Pg No: 1011-1020
3. Murray and Lopez, Mac Donald et al., Lancet 1996;336:2000.
4. API text book of medicine, 9th edition, Vol 2, Pgno :1401-08.
5. R P Eapenet al.,-study of clinical profile and risk factors of cerebrovascular stroke. Gujarat medical journal. 2009;64(2):47-54
6. Chalela JA, Kidwell CS, Nentwich LM et al. Magnetic resonance imaging and computed tomography in emergency assessment of patients with suspected acute stroke: a prospective comparison. Lancet 2007;369(9558):293-8.
7. Burden of disease attributable to major risk factors. Geneva: WHO 2004. Health at a Glance 2011. OCED 2011. pp.2001-2008.
8. Harrison's Principles Of Internal Medicine, 18th edition, Vol-2, pp.3270-3295.
9. Rawal Divyant et al. Photodynamic therapy- a literature review. International journal of scientific research. 2016;5(3):187-88.
10. Patne SV et al. Study of clinical profile of stroke patients in rural tertiary health care centre Int j Adv Med. 2006 Aug;3(3):666-70.