ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 09 | September - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

"A STUDY OF THE ROLE OF MULTIDETECTOR COMPUTED TOMOGRAPHY IN EVALUATION OF ACUTE ISCHEMIC STROKE"

Radio-Diagnosis

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ABSTRACT

Cerebrovascular accidents are one of the leading causes of death after heart disease and cancer in the developed countries and one of the leading causes of death in India. The exact prevalence rate of this disease in the Indian population is not known, although it accounts for about one percent of admissions to general hospital.3

KEYWORDS

stroke,acute ischemia, MDCT and hypodensity

INTRODUCTION -

Stroke is a generic term that describes a clinical event characterized by sudden onset of neurological deficit. Stroke syndromes have significant clinical and pathological heterogeneity that is reflected in their underlying gross pathologic and imaging appearance.1

Arterial ischemia /infarction are by far the most common cause of stroke, accounting for 80% of all cases. The remaining 20% are mostly hemorrhagic, divided between primary spontaneous intracranial hemorrhage (sICH), nontraumatic subarachnoid hemorrhage (SAH), and venous occlusions.2

About 15 to 30% of patients die with each episode of cerebral infarction and 16 to 80% with cerebral hemorrhage. Those who survive are usually left with permanent disability. Thus, stroke becomes a great medical and social problem. Accurate and early diagnosis may improve the morbidity and mortality rates in the future as newer and more effective therapies are currently being instituted.4

Aim And Objective

Aim:

To study the role of multidetector computed tomography in evaluation of acute ischemic stroke.

Objectives:

To study acute ischemic stroke (infarct) with the object of assessing prevalence, age/gender distribution, size and location, intra cranial complications.

To determine the causes on CT brain/ CT brain angiography and outcome To compare these findings with those from existing literature.

MATERIALS AND METHODS

Study Setting: This was a prospective study conducted in the Department of Radiodiagnosis, MGM Medical Hospital, Kamothe, Navi Mumbai.

Type of Study: Prospective Study

Study duration: It was conducted from March 2021 to December 2022 for a period of 22 months.

Method of collection of data: Data was collected using pre-structured proforma which included details such as name, age, gender, presenting complaints, risk factors assessment and findings over multidetector Computed Tomography (Toshiba Slice 16 CT) were noted

Inclusion Criteria:

1. Patients presenting in MGM Hospital, Navi Mumbai with clinical features of acute ischemic infarct (stroke)
2. Patients aged 18 years and above.

Exclusion Criteria:

1. Patient not willing to be part of the study.
2. Hemorrhagic strokes
3. All patients with history of trauma or head injury
4. Pregnant women

Parameters to be measured and Data analysis:

250 patients with acute ischemic infarct (stroke) were subjected to CT examination.

Quantitative data was analyzed and mean, and standard deviation (or median and interquartile range in case of non-normal distribution) were calculated for same. Qualitative variables were expressed in the form of frequency and proportions

RESULTS

In our study, around three-fifth (60.4%) of study participants were males and two- fifth (39.4%) were females.

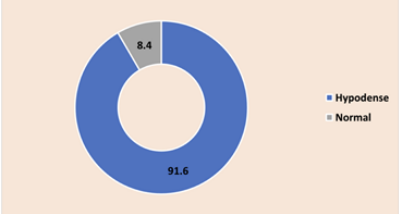
Facial drooping as a clinical feature was seen in 29.6% of study participants while decreased consciousness was seen in 24.8% of participants. Paresis was present in 24.4% of study participants and slurred speech was present in 21.2% of study participants.

Hypertension was present in approximately 50% of study participants. Diabetes as a co-morbidity was present in 26.8% of study participants. Smoking was present in 11.2% of study participants while dyslipidemia (abnormal lipid profile) was present in 8.4% of study participants. Myocardial infarction as co-morbidity was present in 4% of study participants.

Hypodense as finding was seen in 91.6% of study participants while no abnormality was detected in 8.4% of study participants .

Table 4 Distribution of study participants according to findings on CT

CT findings	Frequency (n)	Percentage (%)
Hypodense	229	91.6
Normal	21	8.4
Total	250	100

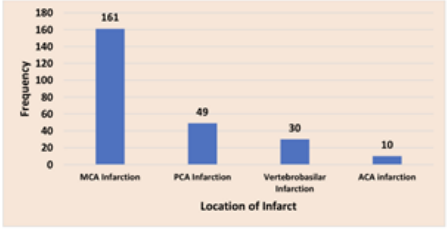


Graph 4 Pie chart showing distribution of study participants according to findings on CT

Table 5 Distribution of study participants according to location of infarct

Location of infarct	Frequency (n)	Percentage (%)
MCA infarction	161	64.4
PCA infarction	49	19.6
Vertebrobasilar infarction	30	12.0
ACA infarction	10	4.0
Total	250	100

MCA – Middle cerebral artery; PCA – Posterior cerebral artery; ACA – Anterior cerebral artery



Graph 5 Graph showing distribution of study participants according to location of infarct

Table 5 and graph 5 shows the distribution of study participants according to location of infarct. Middle cerebral artery infarction was seen in 64.4% of study participants while posterior cerebral artery infarction was present in 19.6% of study participants.

DISCUSSION

In our study, around three-fifth (60.4%) of study participants were males and two-fifth (39.4%) were females. In a similar study by Ali MA et al, the total number of patients was 237 adult patients and their age ranged from 19 to 96 years. Males were 156 while the females were 81[11]. In another study by Kumar LT et al, among the total 100 cases included in the study, 52 patients were males (52%) and 48 patients were female (48%).[10]

Facial drooping as a clinical feature was seen in 29.6% of study participants while decreased consciousness was seen in 24.8% of participants. Paresis was present in 24.4% of study participants and slurred speech was present in 21.2% of study participants. In another similar study by Man K et al, the most frequent chief complaint was weakness in one side of the body (90.5%), followed by weakness and fits (21.4%). Other chief complaints included headache, vomiting, loss of vision and slurring of speech, which constituted 7.1% of symptoms. [12]

Hypertension was present in approximately 50% of study participants. Diabetes as a co-morbidity was present in 26.8% of study participants. Smoking was present in 11.2% of study participants while dyslipidemia (abnormal lipid profile) was present in 8.4% of study participants. Myocardial infarction as co-morbidity was present in 4% of study participants. In a similar study by Man K et al, 15 patients (35.7%) had diabetes mellitus and hypertension, ten (23.8%) had hypertension only, and four (9.5%) had diabetes mellitus only. 13 (31%) of patients were healthy prior to the current presentation. [12]

Hypodensity as finding was seen in 91.6% of study participants while no abnormality was detected in 8.4% of study participants.

Middle cerebral artery infarction was seen in 64.4% of study participants while posterior cerebral artery infarction was present in 19.6% of study participants. Vertebrobasilar infarction was present in 12% of study participants while anterior cerebral artery infarction was present in 4% of study participants.

Acute non-hemorrhagic infarct was seen on MRI in 98.8% of study participants and no abnormality was seen in 1.2% of study participants.

CONCLUSION

Our study concludes that multidetector computed tomography showed hypodense findings in evaluation of acute ischemic stroke. Middle cerebral artery was found to be most common artery involved in acute ischemic stroke. Computed tomography can be good modality which can be used for evaluating patients with acute ischemic stroke in absence of MRI imaging modality.

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