



CLINICO-RADIOLOGICAL PROFILE OF ACUTE STROKE IN PATIENTS WITH HYPERTENSION

Medicine

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ABSTRACT

Background and Objective: Cerebrovascular accidents are an important cause of premature death and disability, and is enhanced by increased prevalence of key modifiable risk factors. Hypertension is one of the important modifiable risk factor for both ischemic and hemorrhagic stroke. CT forms an effective first line of investigation for patients with stroke because of ease of acquisition. However MRI is better in delineating further details and in hyperacute stroke

Method: This study is a case-control hospital-based study, which has been done over a period of 18 months (January 2016 to June 2017). All acute stroke patients with hypertension as per JNC 8 guidelines were included in the study. A total of 164 hypertensive patients presenting with acute stroke satisfying the inclusion criteria were enrolled in the study.

Results: A total of 164 patients were enrolled in the study. The majority of cases were seen in patients with age >60 years, maximum number between the age group 61-70 years constituting about 35% of the cases. The gender distribution showed 60% of cases were male and 40% were of female gender. The type of stroke had both ischemic and hemorrhagic stroke with ischemic stroke contributing to 79% of the cases. The duration of hypertension had no relation to occurrence of disease, however majority of cases were seen in patients with history of hypertension for 5 years or more. The evaluation of blood pressure on presentation showed 57% of cases having an uncontrolled hypertension and 73% of hemorrhagic stroke had uncontrolled pressures on presentation to the hospital. CT was the initial imaging done on presentation which showed 79% infarct and 21% of hemorrhage. Among patients with infarction in CT, 115 cases (87%) had acute changes, 12 cases had lacunar stroke and 4 patients (<1%) had multi infarct state. The topographical assessment of cases showed majority of ischemic stroke were within MCA territory and hemorrhagic stroke being commonly seen in gangliocapsular region in 80% of cases.

Conclusion In this study the clinical and radiological profile of cases presenting with acute stroke were studied. The majority of cases were infarcts and the remaining being hemorrhagic stroke.

It was observed that the incidence of stroke was more common after the age of 60 and more common in male gender. The duration of hypertension had no relation with severity of stroke whereas, uncontrolled blood pressure at presentation had a higher chance of having an ischemic or hemorrhagic stroke.

The ischemic strokes were more common compared to hemorrhagic stroke with MCA territory being most common site of stroke.

KEYWORDS

CVA, stroke, infarct, hemorrhage, CT and MRI

INTRODUCTION

Cerebrovascular diseases are second most commonest cause of mortality and morbidity worldwide affecting majority of population. The prevalence of stroke varies between 147-922/100,000 population across diverse community-based studies.

Stroke is defined as "The rapidly developing clinical symptoms and signs of focal (at times global) disturbance of cerebral function with symptoms lasting for more than 24 hours with no other cause other than that of vascular origin"¹

Hypertension is one of the modifiable and a major risk factor for the stroke. Both ischemic and hemorrhagic strokes are known to occur in patients with hypertension. It's important to differentiate ischemic from hemorrhagic stroke as the line of management is entirely differs.

Stroke basically occurs due to two main pathophysiological mechanisms i.e ischemia and hemorrhage. Among stroke subtypes, ischemic stroke constitutes about 80% of cases and rest being hemorrhagic stroke.

In a patient with suspected stroke, imaging becomes an important line of investigation. CT forms a first line investigation in a patient with stroke. The main advantage of it over other imaging studies is the speed of acquisition. It's done mainly to rule out bleed. MRI is far more sensitive in detecting acute stroke when presented within the window period. In patients with ischemic stroke MRI with DWI is the preferred imaging of choice.

NEED FOR THE STUDY

Hypertension has been shown in studies to be an important risk factor for cerebrovascular accidents. CT is a noninvasive and widely available method for assessing patients with stroke. The study is undertaken to evaluate different types of stroke among hypertensives and to correlate them with the radiological findings.

AIMS AND OBJECTIVES

1. To study the clinico-radiological profile of different types of acute stroke
2. To study the association of hypertension in acute stroke

METHODOLOGY

Study Site - Justice K. S. Hegde Charitable Hospital, a unit of K S Hegde Medical Academy, Nitte University

Period of Study

January 2016 to June 2017

Study Population- All acute stroke patients with hypertension as per JNC 8 guidelines

- 1) Age > 60 years with SBP > 150 mm of Hg and DBP > 90 mm of Hg
- 2) Age < 60 years with Diabetes Mellitus or Chronic kidney disease having SBP > 140 mm of Hg and DBP > 90 mm of Hg

Sample size- 80 minimum hypertensive patients presenting with acute stroke were included in the study. To calculate sample size, the technique of estimation of proportion was used.

Study design

Cross-sectional study (descriptive study)

Statistical analysis

The collected information was summarized using frequency and percentage (descriptive statistics). To compare clinical profile with radiological profile chi-square test and Fisher's exact test was used (inferential statistics). The P value of < 0.05 was considered significant.

Inclusion Criteria

1. All patients age > 18 years of age
2. Acute stroke patients with hypertension

Exclusion Criteria

1. Non hypertensive strokes
2. Old cerebrovascular accidents (>7days)
3. Traumatic stroke
4. Patient refusal

RESULTS

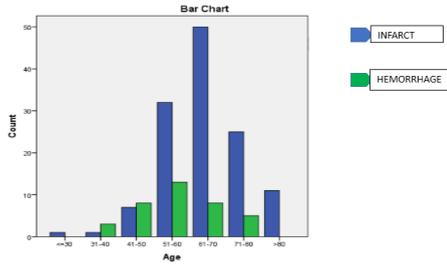


Figure 1: Age distribution

There was wide range in the distribution of cases. The incidence of stroke was maximum between the age group of 61-70 years, which comprises 35% of the total number of cases.

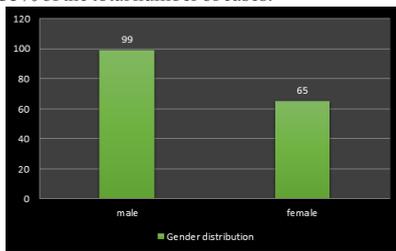


Figure 2: Gender distribution

- 60% of cases in the study were male patients
- 40% of cases in the study were female patients

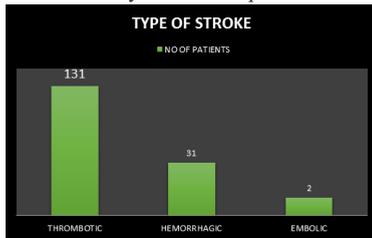


Figure 3: Distribution of different types of stroke among study subjects

81% of cases had ischemic stroke whereas 21% of cases had hemorrhagic stroke

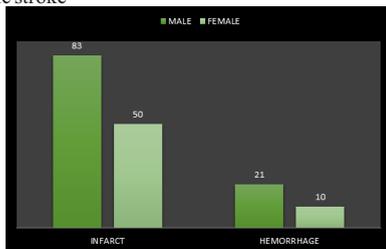


Figure 4: Gender distribution in different types of stroke

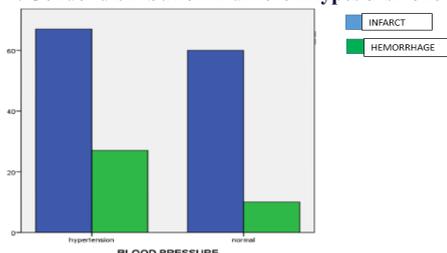


Figure 5: Comparison of blood pressure at presentation between hypertensives and non-hypertensives.

57% of cases had uncontrolled blood pressure at admission, whereas

43% of them had normal blood pressure (p value-0.29). It was observed that cases with hemorrhagic stroke had uncontrolled blood pressure at admission compared to ischemic stroke.

Radiological profile

Figure 6 : CT findings in patients with ischemic stroke

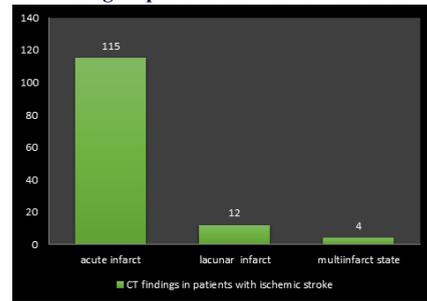


Table 1: Topographical distribution of infarct

Territory	Number
Thalamus	57
Gangliocapsular	39
Pons	20
cerebellum	15

CT findings in patients with hemorrhage

Among study subjects with infarct, it was observed that most of the changes were suggestive of acute infarcts in the above mentioned areas. The most common territory involved was thalamus followed by gangliocapsular region seen in 30% of cases. Multi infarct was seen in about 4 cases.

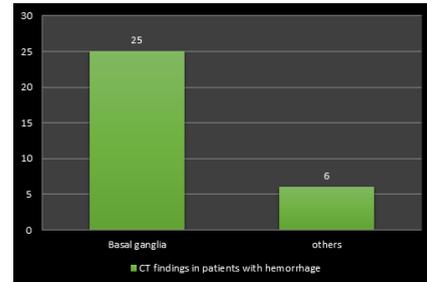


Figure 12: CT findings in patients with hemorrhage

In patients with hemorrhage on CT, majority of cases had bled in gangliocapsular region in about 80% of the cases.

DISCUSSION

In this case study conducted at Justice K S Hegde hospital, Mangalore, a total number of 164 cases having hypertension presenting with acute stroke were included in the study. All patients after clinical examination underwent imaging following admission.

There was wide range in the distribution of cases. The incidence of stroke was maximum between the age group of 61-70 years, which comprises 35% of the total number of cases. This was similar to a study done by Togha M, Sharifpour A et al²³ and Andrawes et al²⁴ in which majority of the patients were aged >60 years of age.

Among a total number of cases, 60% of cases were male and 40% were female patients. The study had more number of ischemic stroke compared to hemorrhagic stroke. A total of 133 cases had an ischemic stroke out of which 83 were male and 50 were female patients. Among 31 patients with hemorrhagic stroke 21 were male and 10 were of the female gender. The blood pressure was assessed at admission showed uncontrolled blood pressure in 57% of cases and normal blood pressure in 43% of the cases. This observation was more evident in cases with hemorrhagic stroke in which 73% of cases had uncontrolled blood pressure at admission. These results were compared with that of study conducted by Koton S, which showed that uncontrolled blood pressure at admission was associated with poor outcome in patients with stroke²⁷, whereas a study conducted by Kvistad, NORSTROKE study showed that failure of transient hypertensive response in acute stroke was associated with poor outcomes²⁸.

The duration of hypertension had no association with occurrence of stroke. Majority of cases were seen in group with 5-10 years of duration of hypertension.

The radiological profile showed that infarct was more common compared to hemorrhage. The topographical area in patients with infarct consisted of thalamus, gangliocapsular, pons and cerebellum. But in patients with hemorrhage on CT, the commonest site was Gangliocapsular area. Though CT was the first line of investigation in patients with stroke, MRI is preferred in patients with acute stroke presenting within first 12 hours and also better for assessment of infarct location, area involved and size of the infarct. These findings were similar to studies conducted on radiological profile in patients with stroke.³⁸⁻⁴²

CONCLUSION

In this study the clinical and radiological profile of cases presenting with acute stroke were studied. The majority of cases were infarcts and the remaining being hemorrhagic stroke.

It was observed that the incidence of stroke was more common after the age of 60 and more common in male gender. The duration of hypertension had no relation with severity of stroke whereas, uncontrolled blood pressure at presentation had a higher chance of having an ischemic or hemorrhagic stroke.

The ischemic strokes were more common compared to hemorrhagic stroke with MCA territory being most common site of stroke.

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