

A Clinical Study on Pathogenesis and Clinical Profile of Stroke in a Tertiary Care Hospital

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ABSTRACT

Background: Stroke or Cerebrovascular accident, is defined as an abrupt onset of a neurological deficit that is attributable to a focal vascular cause. Cerebrovascular disease includes some of the most common and devastating disorders; Ischemic stroke and hemorrhagic stroke. Stroke is second leading cause of death worldwide causing 6.2 million deaths in 2011 and it is major cause of disability. Clinical and Laboratory studies including brain imaging (CT scan and MRI) are used to support the diagnosis. Cerebrovascular ischemia is caused by reduction in blood flow that lasts longer than several seconds. Intracranial hemorrhage is caused by bleeding directly into or around the brain.

Aim of Study: This study is conducted to know the clinical features, etiology of stroke in a teaching hospital.

Materials and Methods: This study is conducted for 1year 3months, in Geetanjali Medical College, Udaipur in the department of General Medicine. We have included 140 cases, out of these 140 Males were 86 and Females were 54. The age group involved is between 20 and 70 years.

Results: Out of these 140 patients, 86 were Males and 54 were Females. The age group involved is between 20 and 70 years. The most common age group involved is 5th and 6th decade. Cerebral hemorrhage is seen in greater than 20% cases. Speech defects and cranial nerve involvement is seen

in around 37% cases. Mortality is around 17%. In females 2% cases are due to cortical venous thrombosis.

Conclusion: Stroke is second most leading cause of Mortality worldwide; Males are commonly affected than Females. Mortality and Morbidity is very high in hemorrhagic stroke. Early diagnosis and early intervention decrease the Morbidity and Mortality.

Keywords: Hemiplegia, Aphasia, Stroke, Hemorrhage, Risk Factors.

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INTRODUCTION

The term stroke is applied to a sudden focal neurologic syndrome. Specifically, the type caused by cerebrovascular disease. Cerebrovascular disease designates any abnormality of the brain resulting from a pathologic process of blood vessels including occlusion of the lumen by embolus or thrombus, rupture of a vessel an altered permeability of vessel wall or increased viscosity or other change in the quality of the blood flowing through the cerebral vessels. Stroke is second most leading cause of death Worldwide. Every year there are approximately 700,000 cases of stroke roughly 600,000 Ischemic lesions and 1,00,000 hemorrhagic lesions with fatalities of 1,75,000 are recorded. The incidence of stroke is increasing in India. The annual incidence of stroke varies from 100 to 150 per 100,000 population. The incidence of cerebrovascular disease increases with age.¹ Nicholls and Johanson reported a 20% decline in the United States

between 1968 and 1976. Both sexes shared in the reduced incidence. According to the American Heart Association, the mortality rate from stroke has declined by 12%, but the total number of strokes may again rising.^{2,3}

There has been more than 100% increase of stroke in low and middle income countries including India from 1970-79 to 2000-2008. Lack of reliable reporting mechanisms heterogeneity in methodology, study population and small size in existing epidemiology studies make an accurate estimation of stroke burden in India challenging. Reliable morbidity and mortality estimate for stroke in India are very limited. The vascular lesions are 2 types: 1. Ischemia with or without hemorrhage; 2. Hemorrhage.

The clinical manifestations of stroke are highly variable because of complex anatomy of brain and its vasculature neurological

manifestations appear within seconds because neurons lack glycogen, so energy failure is rapid if the cessation flow lasts for more than a few minutes infraction or death of brain tissue results.² The risk factors include age, sex, Hypertension, Diabetes, Smoking, Hyperlipidemia, Carotid Stenosis. Common etiological factors include Thrombosis which includes Lacunar Stroke and large vessel thrombosis; embolic occlusion due to, Atrial Fibrillation, Mural Thrombus, Myocardial infarction, Dilated cardiomyopathy, Mitral stenosis and Bacterial endocarditis. And causes of cerebral hemorrhage includes, head injury, AV malformations, rupture of Berry aneurysm, Metastatic brain tumors, coagulopathy and drugs like heparin.³ Patients with history of transient Ischemic attacks and history of suggestive of brain tumors were excluded from this study. Patients with intracerebral bleed due to head injury were also excluded. After careful history taking and clinical examinations, we have advised routine blood investigations like complete blood picture, Blood sugar, Blood Urea, Serum creatinine, serum electrolytes, Electro cardiograph and CT Scan Brain, MRI Brain were advised. Lacunar infarcts are associated with poorly controlled HTN & Diabetes, have been found in several clinical syndromes including contralateral pure motor and sensory deficit., Ipsilateral ataxia with

crural paresis. The neurological deficit may progress over 24 to 36 hours. Middle cerebral artery occlusion leads to contra lateral hemiplegia, hemi sensory loss., Homonymous hemianopia Occlusion of different branches of middle cerebral artery cause; more limited findings Involvement of anterior main division leads to dysphasia, Contra lateral paralysis, loss of sensation of arm, face and lesser extent the leg, posterior branch occlusion produces receptive aphasia and homonymous visual field defects.

MATERIALS AND METHODS

This study has been conducted for 1year 3months in Geetanjali Medical College, Udaipur in the department of General Medicine. We have included total no. of 140 patients in this study. Out of these 140, males were 86 and female patients were 56. We have obtained the consent from all the attendants of patients by giving the form in local language. After taking the history form the attendants. We have examined all the patients in detailed and advised all the investigations like complete Blood picture, Random blood sugar, Blood urea, Serum creatinine, Serum electrolytes, ECG, CT scan Brain and MRI and, Fundoscopy, Lumber picture in selected patients. We have collected the data systemically and computerized by using Ms office.

Table I: Different age groups

Age in Yrs	No. of Patients in Males (86)	Percentage (%)	No. of Patients in Females (54)	Percentage (%)
20 - 29yrs	5	5.8%	6	11.12%
30 - 39yrs	11	12.79%	3	5.5%
40 - 49yrs	17	19.82%	8	14.8%
50 - 59yrs	23	26.72%	16	29.62%
60 – 70yrs	30	34.88%	21	38.8%

Table II: Clinical Features

Clinical Features	No.of Patients in Males (86)	No.of Patients in Females (54)
Weakness	86 (100%)	56 (100%)
Headache	53 (61.6%)	39 (72.4%)
Convulsions	18 (20.92%)	13 (24.8%)
Speech Defect	68 (79.5%)	42 (77.9%)
Coma and Other Features	15 (17.4%)	11 (20.35%)

Table III: Different types of Lesions

Types of Lesions	No.of Patients (M) 86	No.of Patients (F) 54
Infarction	48 (55.81%)	29 (53.70%)
Haemorrhage	27 (31.39%)	13 (24.07%)
Others	13 (15.11%)	12 (22.5%)

Table IV: Different causes of Stroke

Causes	No.of Patients (M) 86	No.of Patients (F) 54
Hypertension	39 (41.5%)	20 (36.5%)
Diabetes	35 (40.8%)	18 (31.7%)
Heart Diseases	7 (8.92%)	10 (8.75%)
Smoking	5 (6.52%)	8 (6.25%)

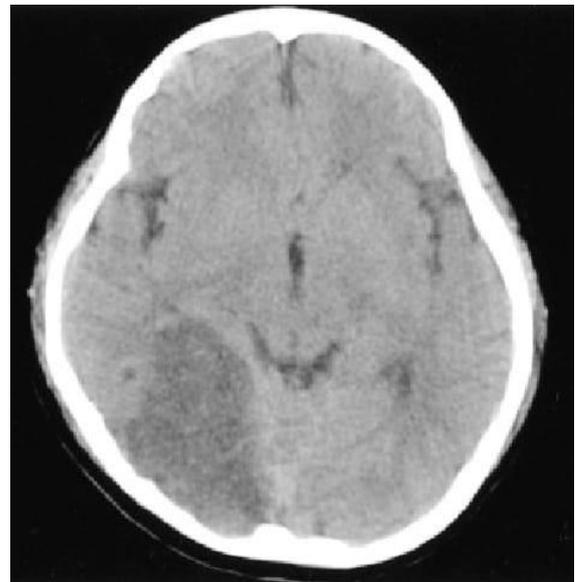
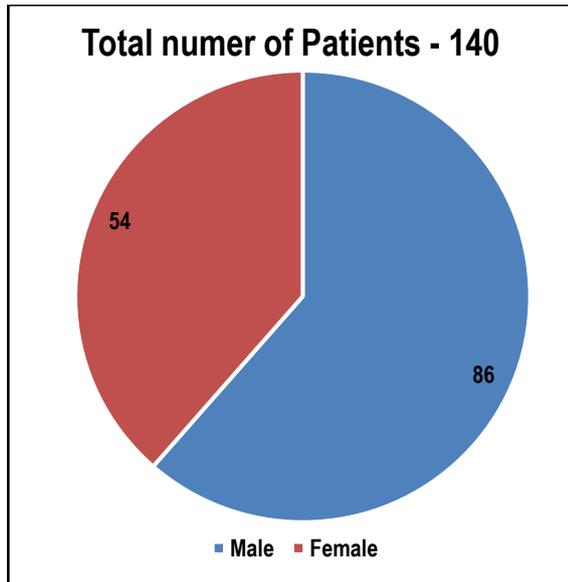


Fig 1: The brain CT scan revealed right PCA area infarct

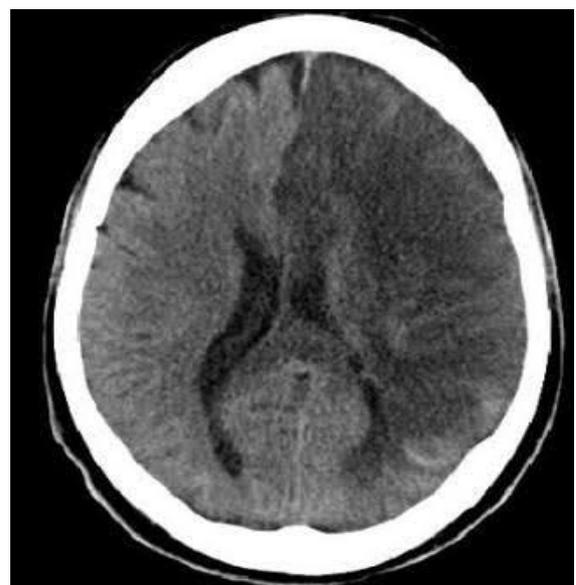
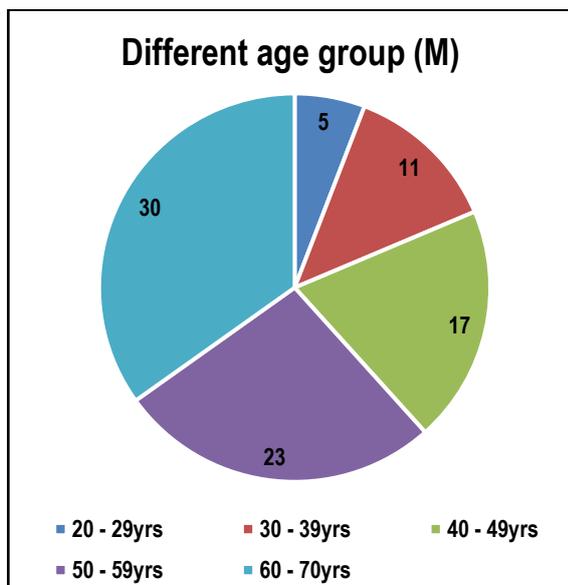


Fig 2: CT scan of brain showing Massive cerebral infarction

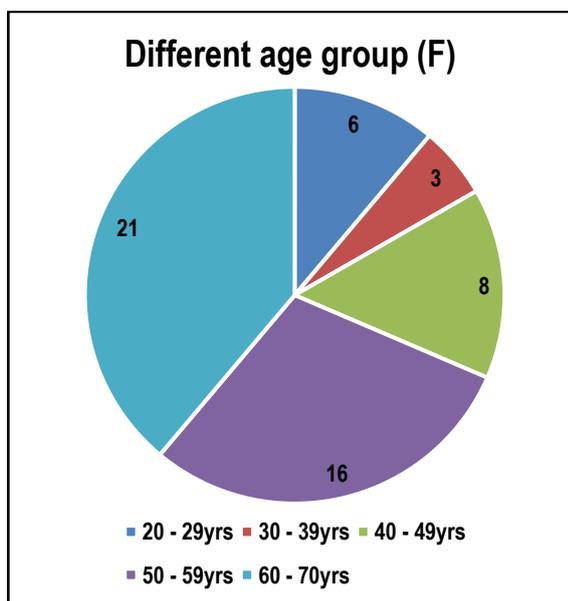


Fig 3: CT Scan Brain Showing Haemorrhagic Stroke

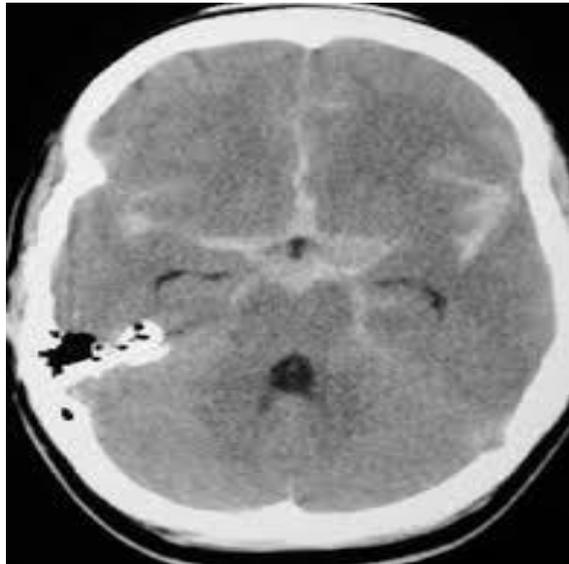


Fig 4: CT Scan Brain Showing Sub Arachnoid haemorrhage

RESULTS AND DISCUSSION

We have included 140 patients in this study. Out of these 140 patients 86 were males and 54 were females. The age group involved is between 20 and 70 years. Males are affected more common than females. And the incidence of stroke is increase with age. Stroke in young is also a major problem worldwide. In our study 61.25% of patients are in 6th and 7th decades. The studies conducted by Banerjee et al shows almost similar results, that is 64.7% patients are in 6th and 7th decade.⁴ Prevalence of stroke was also studied in Rohtak in Haryana in 1974. The crude prevalence of stroke was 44.28% per 100,000 persons in this year. Prevalence of stroke in men (46.78% per 100,000) was higher than women (41.52% per 100,000).⁵ The clinical features include paralysis (weakness), Headache, Convulsions, Speech defects, Altered sensorium. In our study paralysis seen in 100% patients, Headache in 61.6% in males; 72.4% in females; speech defects seen in 79.5% in males and 77.9% in females. Gouri Devi M et al observed paralysis in 100% patients, speech defects in 71.5% and convulsions in 28.6% patients.⁶

3 major types of lesions are seen in stroke 1 is infarction, 2 is haemorrhage, 3 is embolism and others. In our study infarction is seen in 55.81% of males and 53.70% of females and haemorrhage is in 31.39% in males and 24.07% in females. The studies conducted by Kaul. S. et al shows that infarction is 58.5% patients and haemorrhage in 28.6%. We noticed different cranial nerve involvements also. Facial nerve is commonest cranial nerve involved in the stroke. The common etiological factors in our study are Hypertension, Diabetes, Heart diseases, Smoking, Obesity. The mortality in our study is around 17%. The main cause is intracerebral bleed and other comorbid conditions like, uncontrollable Diabetes, Renal Failure.

Stroke or Cerebrovascular disease designates any abnormality of the brain resulting form a pathogenic process of blood vessels including occlusion of lumen by embolus or thrombus or by a rupture of a vessel. The incidence of stroke is increases with age and males are more commonly affected than females. Worldwide statistics shows that the "Stroke in Young" is also increasing in number.⁷ According to the estimates from the GBA study in 2001, ones 85% of global burden of stroke was born by low and middle income countries.

India has been experiencing significant demographic, economic and epidemiological transition during the past two decades. These have resulted in an increase in life expectancy and consequently an increase in aging population. Reliable Morbidity and Mortality estimates for stroke in India are very limited.⁸

Most embolic strokes characteristically occur suddenly, and deficit reaches peak almost at once. Thrombotic strokes may have an abrupt onset, but they evolve more slowly over a period of several minutes or hours. In hypertensive cerebral haemorrhage, also abrupt in onset, the deficit may be virtually static or steadily progressive over a period of minutes or hours, while sub arachnoid haemorrhage is almost instantaneous. The most important feature of stroke is its focal signature. The neurological deficit reflects both the location, and the size of infarct or haemorrhage Hemiplegia stands as the classic sign of all cerebrovascular diseases. Whether in the cerebral hemisphere or brainstem. The other manifestations include paralysis, sensory deficits on one side of the body, Aphasia, visual field defects, diplopia, another important feature is TIA (Transient Ischemic Attacks) present as temporary loss of neurological deficit. Left hemispheric lesions usually causes aphasic disturbances, right hemispheric lesions cause anosognosia, patients deny the problem. The common risk factors are Hypertension, Diabetes, Smoking, hyperlipidaemia, cerebral infarction basically comprises two pathophysiologic processes, loss in the supply of oxygen and glucose secondary to vascular occlusion and changes in cellular metabolism. In a global systematic review on stroke epidemiology, the age adjusted stroke incidence rate in HIC was reported to be 94 per 10,000 person years during the 2000 to 2008. The studies concluded by Benneth et al shows almost similar results in their observations.⁹

Stroke or cerebrovascular accident is second most leading cause of death worldwide. The incidence of stroke increases gradually with age 40 patients was included in our study. The sex ratio showed in the study conducted by Mahndiratta MM et al is 1.08.:1 is nearer to 1:4:1 to our study and the study conducted by Zunni at al shows the ratio as 1.2:1 in Africa.¹⁰ In present study the conscious levels were disturbed in 17.4%. The study conducted by Bansal et al shows that disturbances observed in 23.32% patients' convulsions in 12.37%. In our study the smoking is associated with 22% in Males. The study conducted by Dalal et al shows 40% and Alveray et al shows 56.7% CAD was observed in 8.92% in our study. The study by Alverey et al shows 3.9%.

The Ischemic stroke was observed in 55.81% pts, and hemorrhagic in 31.39% stroke is observed in 34% patients. The study by Bevan et al shows Ischemia in 28.26% and hemorrhage in 16.7% patients. Diabetes was present in 40.08%. Hypertension was present in 41.05% patients. In Dala et al study the incidence of Hypertension. showed as 40% (Ischemic infarcts were seen in 17 40%) Ischemic infarcts were seen in 66% patients the infract in MCA lesions was seen 17(62%) patients; 3 (9.2%) patients have PICA infracts 6 (23.57%) patients had ACA infarcts, 4 patients had infracts is thalamocapsular region and 2 in cerebellar region.

Atrial Fibrillation observed in 3 cases. The common cause of atrial Fibrillation includes coronary artery disease, Hypertension, Rheumatic heart disease especially Mitral stenosis and Mitral regurgitation, dilated cardiomyopathy, Thyrotoxicosis and chronic obstructive pulmonary disease. The study conducted by Sridharan at al shows 2.25% cases.¹⁰ Lopez at al observed that multiple

infarcts hemorrhage in 18.2%, hemorrhage involving MCA Territory in 42.4% cases in basal ganglia in 15.6% cortical venous Thrombosis was seen in 12.5% patients. Venkat Ramana et al observed that cortical venous thrombosis in 2.1% cases. Evaluation of various risk factors in young are important as they may play a major role in predisposing an individual to a disease which has major burden on the family and society, as we had excluded space occupying lesions we had not considered, Brain Tumors and other lesions in our study.

CONCLUSION

The stroke cerebrovascular disease is very common in India. The incidence of the stroke is increase with age with highest Morbidity and Mortality the economic burden is more on the country and society. With modifiable risk factors the Morbidity and Mortality of stroke can be reduced.

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