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ORIGINAL ARTICLE

STUDY ON THE ROLE OF RISK FACTORS IN CEREBRO VASCULAR STROKE

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ABSTRACT: AIM: To study the role of risk factors in Cerebrovascular Stroke. **MATERIALS AND METHODS:** 60 patients who were admitted with cerebro vascular stroke over 2 months of period from 1st November to 31st December 2014 in King George Hospital AMC, Visakhapatnam studied retrospectively. **RESULTS:** In this study majority of cases (43) are males contributing to 71.7%. The stroke is more prevalent in the middle age.The most common presentation other than weakness is altered sensorium in 21 cases (33.6%). Among 60 cases 40% (24) of cases had right sided lesion, 60% (36) of cases had left sided lesion. Hypertension is more commonly associated with haemorrhagic (26.7%) than ischaemic strokes. Smoking is more responsible for ischaemic strokes (30%) than haemorrhagic. Alcohol is found to be the most significant risk factor in both types of strokes (61.7%). Diabetes is present in 9 cases (15%). Hyperlipidaemia was found more significantly among males (20%) both in ischaemic stroke (13.3%) and haemorrhagic stroke (6.7%).Majority of cases that is 45 cases (75%) have multiple risk factors. **CONCLUSION:** Acute stroke is a heterogeneous condition with respect to prognosis. Though the stroke related mortality is steadily declining in the west, it has been rising in India. The most commonly affected age group is 50-59 years which is the golden period in one's life. Modifiable risk factors should be strictly corrected especially those who also have fixed risk factors. Probability of stroke incidence increases with the presence of multiple abnormalities in the risk profile. The recognition of multiple risk factors for the stroke at early stage may help both patient and physician to prevent further complications.
KEYWORDS: stroke, modifiable risk factor, risk profile, prognosis, mortality.

INTRODUCTION: Stroke is a major cause of disability and death. This is the third most common cause of death after ischemic heart disease and cancer. Approximately 16 million people worldwide are affected by stroke each year, and the estimated prevalence of stroke survivors is over 60million.[1] Though the stroke related mortality is steadily declining in the west, it has been rising in India. This is due to the fact that the life expectancy has increased and urbanization has changed the lifestyle.

The current World Health Organization definition of stroke (introduced in 1970 and still used) is "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin". Thus clinical and laboratory support and brain image are required for diagnosis. At present it is very difficult to predict outcome in an individual with great accuracy.[2] Nowadays CT scan enables us to differentiate infarct from haemorrhage whereas MRI has advantage of more sensitivity for posterior fossa lesions, both of these guides the diagnosis and appropriate management timely.

Age, gender; race, ethnicity, and heredity have been identified as markers of risk for stroke. Although these are fixed risk factors and cannot be modified, their presence helps to identify those at greatest risk, enabling vigorous treatment of those risk factors that can be modified. Early treatment or prevention of modifiable risk factors can reduce the mortality and morbidity of stroke.

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Acute stroke is a heterogeneous condition with respect to prognosis. Deaths in the first few days are almost all due to the brain lesion itself, due to intracranial hemorrhage or large cerebral infarcts with herniation or direct disruption of vital brain stem centers by the lesions or peri lesional edema, after the first week are most likely to be due to indirect consequences of the brain lesion or coincidental cardiac disease. After the first month, the risk of death becomes much less.

AIM:

- To study the role of risk factors in acute stroke cases.
- To study the difference in ischaemic and haemorrhagic strokes.

MATERIALS AND METHODS: Sample was collected retrospectively from cases admitted in King George Hospital Visakhapatnam with cerebro vascular stroke over a period of two months-time (1st November 2014 – 31st December 2014). Detailed history was noted, cases were analyzed for various parameters like serum lipid profile levels, ECG, 2D ECHO, Carotid Doppler study, U/S abdomen, CT scan, MRI and other lab investigations. Age, sex, risk factors, complications and mortality were also noted.

INCLUSION CRITERIA: Both sexes aged more than12years who were admitted with acute cerebro vascular stroke in medical wards during 1st November -31th December 2014 and were clinically and radio logically confirmed

EXCLUSION CRITERIA:

- Age less than 12years;
- Chronic stroke and stroke without radiological support (CT /MRI scan) were excluded.

RESULTS:

Gender	Incidence
Male	43 (71.7%)
Female	17 (28.3%)
Total	**60**

Table 1: Distribution of cases according to Gender

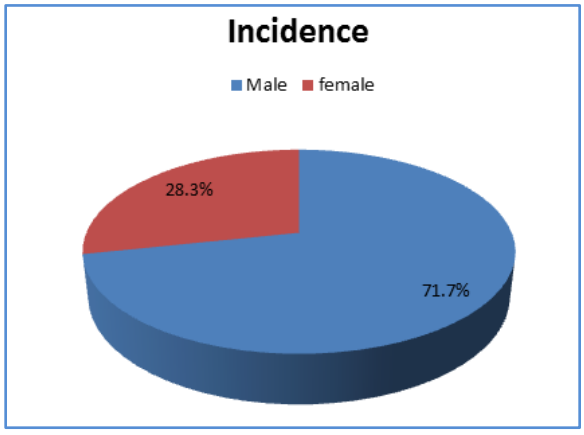

Fig. 1: Distribution of cases according to Gender

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In this study majority of cases (43) are males contributing to (71.7%). The male to female ratio is 2.5:1 which clearly revealed that stroke is more common in males than females. (Table1)

Age (yrs)	Males	Females	Total
40-49	7 (11.2%)	6(9.6%)	13(20.8%)
50-59	21(33.6%)	2(3.2%)	23(36.8%)
60-69	11(17.6%)	3(4.8%)	14(22.4%)
70-79	4(6.4%)	4(6.4%)	8(12.8%)
80 & above	0(%)	2(3.2%)	2(3.2%)
Total	**43**	**17**	**60**

Table 2: Distribution of cases according to age

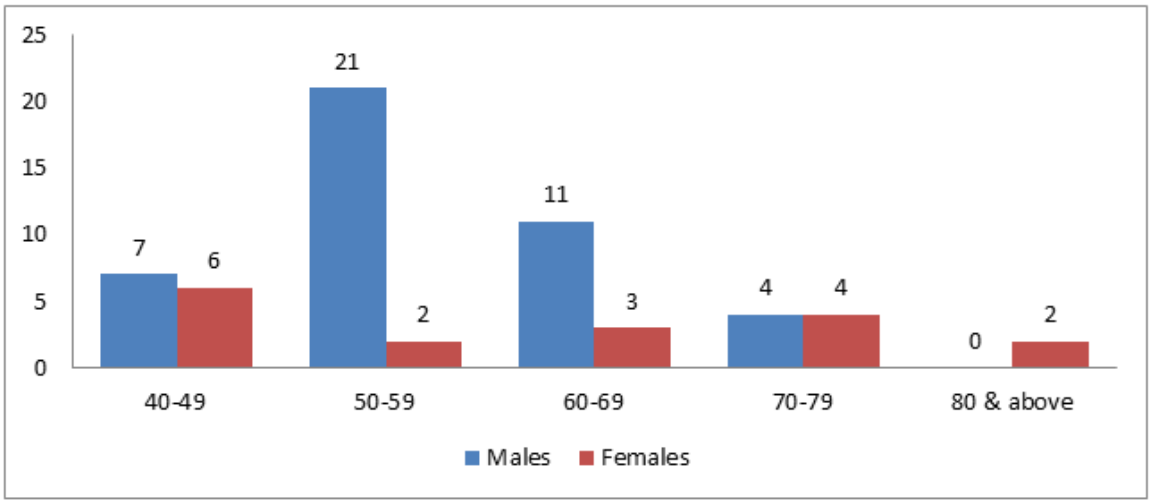

Fig. 2: Distribution of cases according to age

In the present study majority of cases are in the age group of 50-59 years constituting to 36.8%.Among which 33.6% are males and 3.2% are females. The age ranges from 40 years to85 years with a mean age of 56.8 yrs, which was related closely to the study conducted by Naik M.Rauniyar R. K., Sharma U. K. et al[3] who found mean age at 58.27 yrs. (Table2)

Location	Incidence
Rural	33 (55%)
Urban	27 (45%)
Total	**60**

Table 3: Distribution of cases according to Rural/Urban

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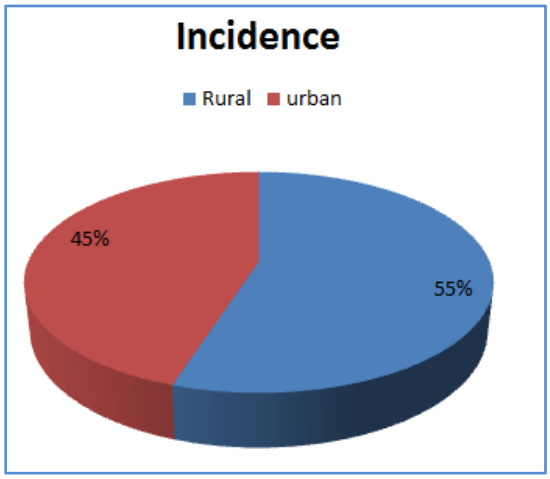

Fig. 3: Distribution of cases according to Rural/Urban

In this study majority of cases that is 55% of cases belong to rural areas and 45% of cases are from urban areas. (Table3)

Presentation	No. Of cases
Altered sensorium	21 (33.6%)
Swaying	2 (3.2%)
Headache	16 (25.6%)
vomiting	12 (19.2%)

Table 4: Distribution of cases according to presenting complaints other than weakness

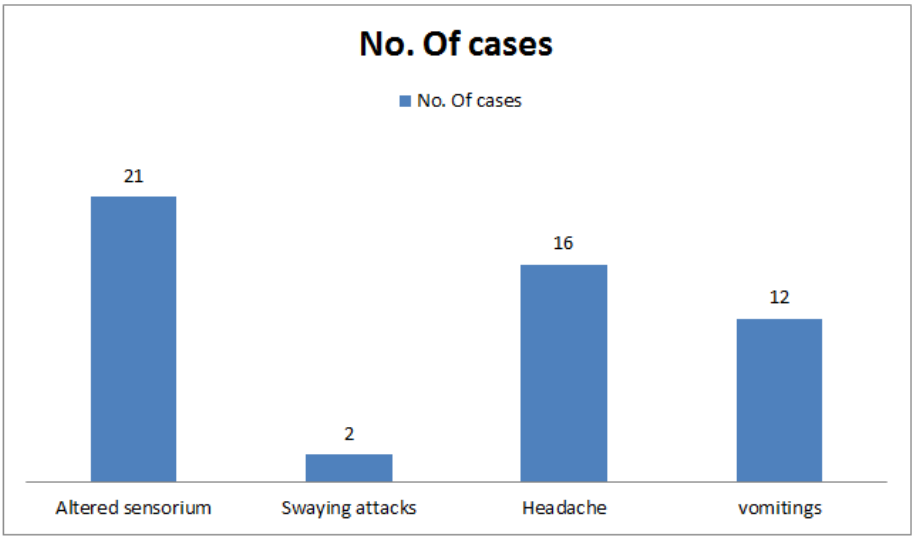

Fig. 4: Distribution of cases according to presenting complaints other than weakness

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In this study the most common presentation other than weakness is altered sensorium in 21 cases (33.6%) followed by headache in 16 cases, vomiting in 12 cases, swaying in 2 cases. Most of them are commonly associated with haemorrhagic stroke than ischaemic. (Table4)

Type of lesion	Incidence
Infarct	30(50%)
Haemorrhage	30 (50%)
Total	**60**

Table 5: Distribution of cases according to type of lesion

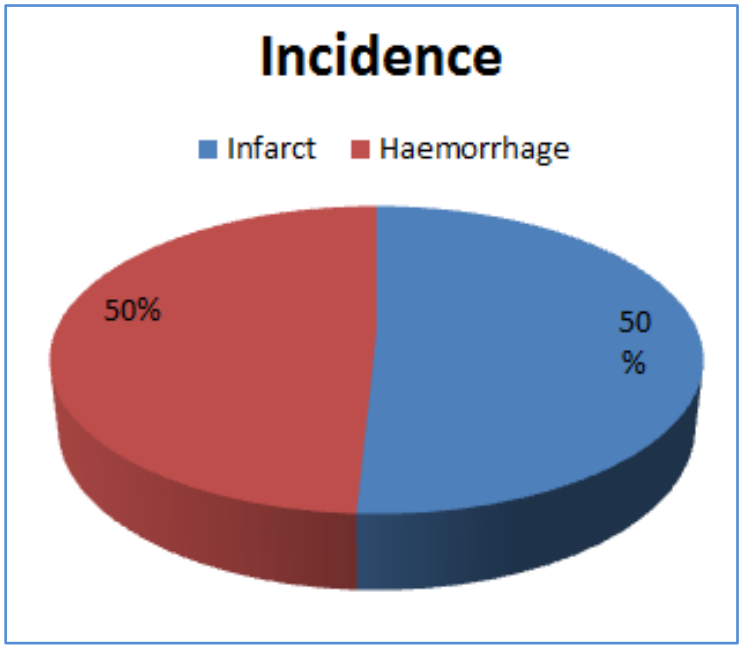

Fig. 5: Distribution of cases according to type of lesion

In this study out of 60 cases 30 cases (50%) are ischemic strokes, 30 cases (50%) are haemorragic strokes. It reveals that there is no difference found in between ischaemic and haemorrhagic strokes (Table5). Further it is observed that in 15 (50%) out of 30 cases of haemorrhage the site of lesion is capsulo ganglionic region. And among ishaemic strokes the most commonly involved territory was MCA territory.

Side of lesion	No. Of cases
Right side	24 (40%)
Left side	36 (60%)
Total	**60**

Table 6: Distribution of cases according to Side of lesion

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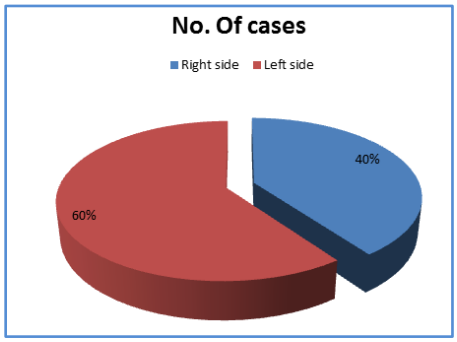

Fig. 6: Distribution of cases according to Side of lesion

Among 60 cases 60% that is 36 cases had left sided lesion, 40% that is 24 cases had right sided lesion. The present study reveals that the commonest presentation is right sided weakness which is due to left sided pathology most of the times. (Table6)

Risk factors		Infarct		Haemorrhage		Total		Total	Present study %
		M	F	M	F	M	F		
Age >50						36	11	47	78.3
Sex	M	20		23				43	71.7
	F		10		7		17	17	28.3
Hypertension		9	5	11	5	20	10	30	50
Smoking		15	3	14	1	29	4	33	55
Alcoholic		15	3	18	1	33	4	37	61.7
Diabetes mellitus		4	1	3	1	7	2	9	15
CVS disorders		5	4	3	1	8	5	13	21.7
Lipid abnormalities		8	4	4	0	12	4	16	26.7

Table 7: Distribution of cases according to risk factors

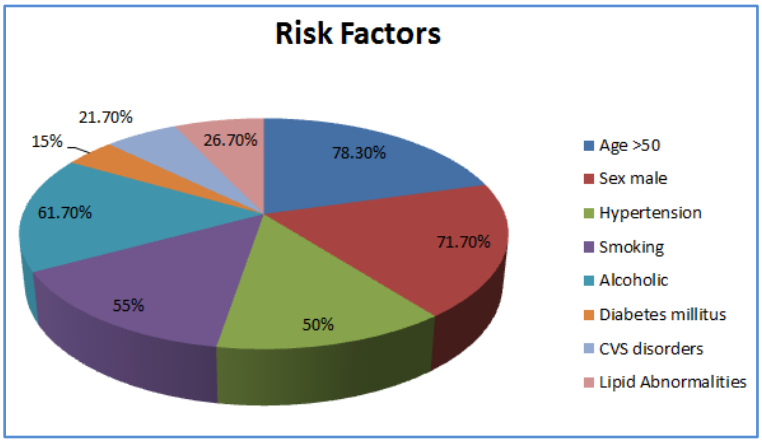

Fig. 7: Distribution of cases according to risk factors

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INCIDENCE OF RISK FACTORS:

AGE >50: In the study the stroke is more prevalent in the middle age. It consists of total 47 cases (78.3%) and more common in males 36(60%) than females.

SEX: In the study males are commonly effected in haemorrhagic stroke (38.3%) and females in ischaemic. (16.7%)

HYPERTENSION: This study further reveals that hypertension is more commonly associated with haemorrhagic (26.7%) than ishaemic strokes (23.3%). Most of the patients present more than140/90 mm of Hg. In the Hiroshima and Nagasaki cohort study, the risk of ICH increased with systolic blood pressure level.[4] Epidemiologic studies show that there is a gradually increasing incidence of both coronary disease and stroke as the blood pressure rises above 110/75 mmHg.[5]

SMOKING: Cigarette smoking increases risk (RR) of ischemic stroke nearly two times,[6] with a clear dose-response relation. The habit of smoking is significantly (48.4%) found among males in both types, whereas among the females it is insignificant (6.7%). In the present study it is revealed that smoking is more responsible for ischaemic strokes (30%) than haemorrhagic.

ALCOHOL: It was found in this study that consumption of alcohol was more among the male (55%) and in the case of female it is insignificant (6.7%).Further the study shows that alcohol is the most significant risk factor in both types of strokes (61.7%)**.**

DIABETES: It is revealed that diabetes is present in 9 cases (15%). The present study indicates males (11.7%) who suffer from diabetes are more prone for stroke than females.

HEART DISEASES: In the present study it is evident that cardio vascular events like AF, old CAD, and Mitral Stenosis were found in 13(21.7%) cases. Out of them 9(15%) cases were ishaemic cases and 4(6.7%) were haemorrhage.

HYPERLIPIDEMIAS: It is revealed that this risk factor was found more significantly among males (20%) both in ischaemic stroke (13.3%) and haemorrhagic stroke (6.7%). (Table7)

Risk factors	No. cases
No risk factors	4 (6.7%)
Single	11 (18.3%)
Multiple	45 (75%)
Total	**60**

Table 8: Frequency of risk factors

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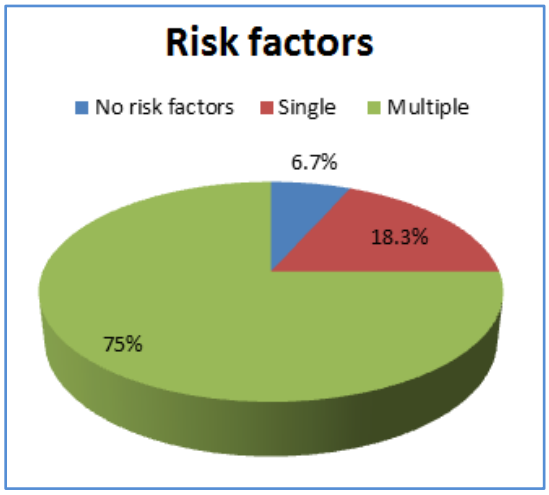

Fig. 8: Frequency of risk factors

Majority of cases that is 45 cases (75%) have multiple risk factors, followed by 11 patients have single risk factor, and 4 cases have no risk factors. The present study highlights that multiple risk factors are found in 3 out of 4 cases. (Table8)

Outcome	No. cases
Death	10 (16.7%)
Partial recovery	50 (83.3%)
Total	**60**

Table 9: Outcome

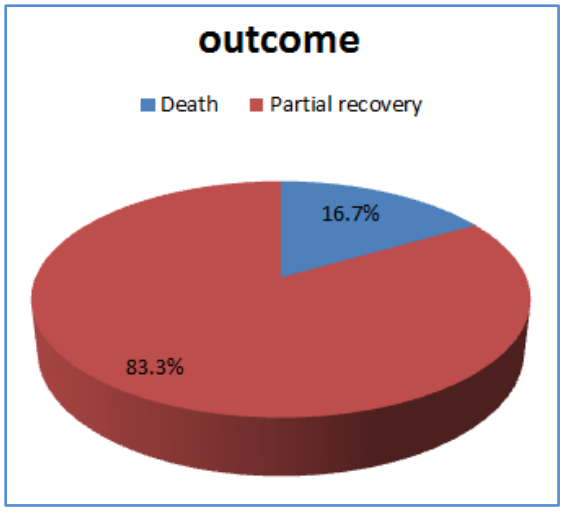

Fig. 9: Outcome

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In this study out of 60 cases 10 cases (16.7%) had died. Out of the 10 cases 9 are haemorrhagic stroke and 1 has ischemia. All the cases are presenting with loss of consciousness. 6 out of 10(60%) cases have multiple risk factors. (Table9)

DISCUSSION: The risk factors of stroke are both fixed and modifiable. Modifiable risk factors are those factors that are influenced by lifestyle or behavioural changes like hypertension, heart disease, diabetes, smoking, hyperlipidaemia, excess alcohol. Non-modifiable risk factors are those which we cannot control. These include age, gender, race, and heredity. Early diagnosis of modifiable factors is necessary to prevent the morbidity and mortality of the stroke. When they are associated with fixed factors they should be managed very strictly.

In the present study Hypertension is found to be the most significant modifiable risk factor for Haemorrhagic strokes. Both systolic and diastolic hypertensions were at risk for development of stroke and isolated systolic hypertension increases risk of stroke by 2-4 times. Chronic hypertension accelerates atherosclerosis and its complications. Cigarette smoking is the most important modifiable risk factor for SAH[7] and giving up smoking decreases but does not eliminate the excess risk.[8] Increasing alcohol consumption increases risk for brain hemorrhage.[9] Acute alcohol intoxications and heavy drinking have been associated with an increased risk of cerebral infarction and subarachnoid hemorrhage. Regular alcohol intake is associated with hypertension and increased risk of death from stroke.

Diabetes has an increased susceptibility to atherosclerosis and an increased prevalence of atherogenic risk factors, notably hypertension, obesity, and dyslipaedemias. Increased insulin resistance has direct effect on atherosclerosis of the carotid arteries, independent of glucose status. Diabetes increases the likelihood of large and small artery occlusive disease and ischemic stroke but has not been shown to predispose to hemorrhagic stroke.[10] Cardiovascular conditions like atrial fibrillation, IHD, mitral annular calcification are known for increased risk for stroke.[11] Carotid stenosis which is evident in carotid Doppler study whether symptomatic or asymptomatic has a definite role in the pathogenesis of stroke.

Stroke is one of the leading causes of death and disability in India.[12] Probability of stroke increases with the presence of multiple abnormalities in the risk profile. The recognition of multiple risk factors for the stroke at early stage may help both patient and physician to prevent further complications. A wide variety of factors influence stroke prognosis including age, stroke severity, stroke mechanism, infarct location, co-morbid conditions, clinical findings, and related complications. Therefore hypertension–stroke control programme is of paramount importance in primary and secondary stroke prevention.[13]

SUMMARY:

1. The most commonly affected age group is 50-59years which is the golden period in one's life.
2. Acute strokes are more common in males than females.
3. Cerebral infarction accounts most of the cases than haemorrhage in females.
4. Most of the strokes are associated with multiple risk factors than single/no risk factors
5. Hypertension, smoking and alcohol are associated with hemorrhagic strokes in most of the cases
6. Smoking, Hyperlipidemia and diabetes are commonly seen in ischemic strokes.

7. Mortality is common in haemorrhagic stroke with multiple risk factors.
8. Modifiable risk factors should be strictly corrected especially those who also have fixed risk factors.

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