Original Research Paper

Geriatric Medicine

STUDY OF LACUNAR STROKE IN ELDERLY

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ABSTRACT Lacunar infarcts are small (2 to 15 mm in diameter) non-cortical infarcts caused by occlusion of a single penetrating branch of a large cerebral artery. These branches arise at acute angles from the large arteries of the circle of willis stem of the middle cerebral artery (MCA), anterior cerebral artery, posterior cerebral artery or the basilar artery. Lacunar infarct most often are asymptomatic due to small size, but significant physical and cognitive disability depends on the location and accumulation of multiple lacunar infarctions. Stroke is one of the leading causes of functional impairment and disability. As there are a very few Indian studies on risk factors of lacunar strokes in elderly. Therefore, it becomes very pertinent to study lacunar stroke in Indian elderly population.

INTRODUCTION

Lacunar infarcts are small (2 to 15 mm in diameter) non-cortical infarcts caused by occlusion of a single penetrating branch of a large cerebral artery.

These branches arise at acute angles from the large arteries of the circle of willis stem of the middle cerebral artery (MCA), anterior cerebral artery, posterior cerebral artery or the basilar artery. Lacunar infarct most often are asymptomatic due to small size, but significant physical and cognitive disability depends on the location and accumulation of multiple lacunar infarctions. Stroke is one of the leading causes of functional impairment and disability.

AIMS & OBJECTIVES:-

To study the risk factors of lacunar stroke To find out incidence of lacunar stroke amongst stroke in elderly.

MATERIAL AND METHODS

This is a prospective study performed in 32 patients ≥ 60 years of age from June 2021 to June 2022 who are diagnosed cases (new and follow up) of lacunar stroke attended by geriatric department.

A written signed informed consent was taken from the patients prior to enrolling the subjects in the study.

Duration Of Study

June 2021 to June 2022

Inclusion Criteria

History of or acute onset lacunar stroke in patients aged 60 years and above Willing to participate in the study

Exclusion Criteria

Transient ischaemic attacks Intracranial space occupying lesions Age less than 60 years

Sample Size

A sample of 32 diagnosed cases (new and follow up) of lacunar stroke were included in the study.

Stastical Analysis

The data was entered into the MS-Excel worksheet and further analysis was carried using IBM SPSS Statistics 26.0 software. The data was presented using frequency, percentage, mean and Standard deviation. Statistical test such as z-test and chi-square test was used. The level of significance was set at 5%. All p-values less than 0.05 were treated as significant.

The table below indicates distribution of study subjects according to the gender and age (in years).

Out of 32 study subjects, 22 (68.8%) were male and 10 (31.3%) were female. The proportion of males is significantly higher as compared to the females (p<.01).

Out of 32 study subjects, 14 (43.8%) were in the age group 60-65 years, 9 (28.1%) were in the age group 66-70 years, 2 (6.3%) were in the age group 71-75 years, 5 (15.6%) were in the age group 76-80 years and 2 (6.3%) were in the age group 80-85 years.

Distribution according to Demographic variables		
Frequency		Percent
Sex		
Male	22	68.8%
Female	10	31.3%
Age		
60-65	14	43.8%
66-70	9	28.1%
71-75	2	6.3%
76-80	5	15.6%
80-85	2	6.3%
Mean age = 69.0 ±6.95, min = 60, max = 85		

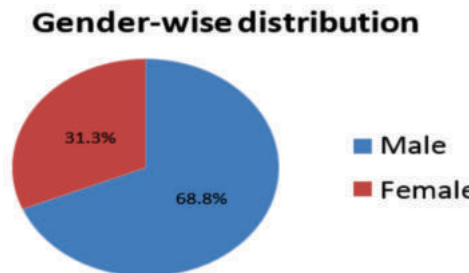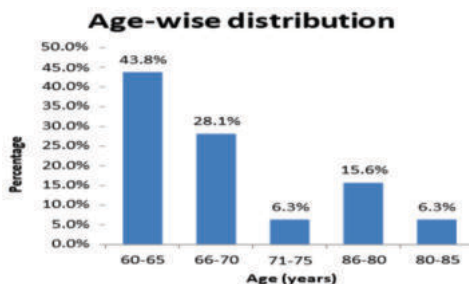Age-wise distribution

Gender-wise distribution

Table below indicates distribution of study subjects according to co-morbidities, habits, symptoms and site of infarction. Out of 32 study subjects, 12 (37.5%)had hypertension, 20 (62.5%) had diabetes, 23 (71.9%) were obese and 25 (78.1%) had hyperlipidemia.

Out of 32 study subjects, 20 (62.5%) were smokers and 11 (34.4%) were alcohol drinkers.

One (3.1%) participant had pure sensory syndrome, 3 (93.4%) had dysarthria, 3 (9.4%) had ataxia, and 25 (78.1%) had pure motor.

7 (21.9%) study subjects having 1 lacunar infarct, 11 (34.4%) in CR, 12 (37.5%) in PL of IC, 14 (43.8%) in AL of IC, 15 (46.9%) in thalamus, and 18 (56.3%) had multiple lacunae.

Distribution according to study variables			
	Frequency	Percentage	p- value
Co-morbidities			
HTN	12	37.5%	
DM	20	62.5%	p<.05 *
Obesity	23	71.9%	
Hyperlipidemia	25	78.1%	
Habits			
Smoking	20	62.5%	p<.05*
Alcohol	11	34.4%	
Symptoms			
Pure sensory	1	3.1%	
Dysarthria	3	9.4%	p<.05*
Ataxic	3	9.4%	
Pure motor	25	78.1%	
Site of infarct			
1 lacuna	7	21.9%	
CR	11	34.4%	
PL of IC	12	37.5%	
AL of IC	14	43.8%	p<.05*
Thalamus	15	46.9%	
Multiple	18	56.3%	
Multiple Lacunae	25	78.1%	
*: Significant at 5% level of significant			

Co-morbidities

Habits

Symptoms

Site of infarct
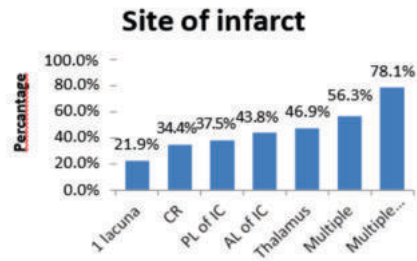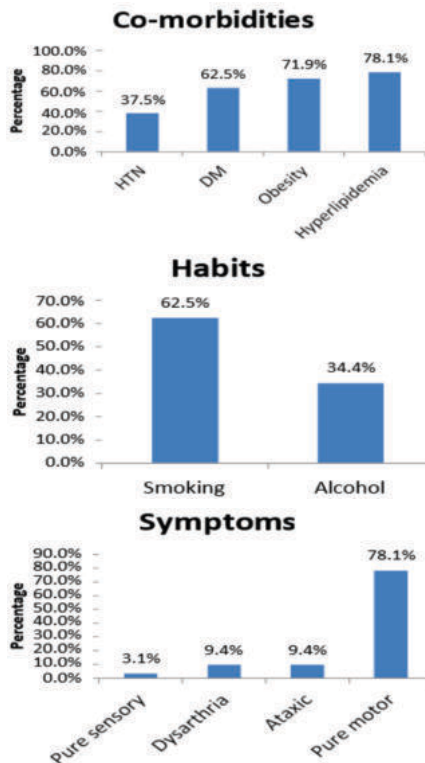
RESULTS
1) The maximum patients suffering from lacunar stroke were in the 60-65 years age group.
2) The mean age was 69 years.
3) Males were more affected than females.
4) Diabetes Mellitus was more common than Hypertension among the subjects.
5) Hyperlipidemia was also found to be a risk factor for lacunar stroke.
6) The most common type of lacunar stroke seen was pure motor type followed by dyasrthria.
7) Total 78% patients were found to have multiple lacunar infarcts, while 21.9% had single lacunar infarct on neuroimaging.

DISCUSSION
Sudden onset neurological deficit requires emergent neuroimaging. An initial non-contrast head CT scan is preferred in an acute setting as it is readily available, quick, and useful to rule out life- threatening conditions such as intracerebral bleed or herniation.

CT scan rarely identifies lacunar ischemic insult within the first 24 hours due to its small size. If seen, lacunar strokes are ill-defined hypodensities on CT scan, unless there is a hemorrhagic component to the acute stroke. A hyperdensity of a large artery on non-contrast head CT indicates the presence of thrombus inside the arterial lumen or vessel calcification. Early infarct signs on non-contrast CT include loss of gray-white differentiation and focal hypoattenuation of brain parenchyma. These details are difficult to read in small subcortical strokes. Chronic lesions may appear as hypodense foci.

CT angiogram of the head and neck can also be done. This can show a filling defect that is consistent with a thrombus blocking a specified vessel. It may also show arterial narrowing, and extensive vessel disease, like in the carotid arteries, which may be a source of an embolus or the middle cerebral artery features consistent with an atheroma. Neurovascular imaging modality is essential to determine the presence of large artery occlusion as it helps determine the need for catheter guided thrombolysis.

MRI is a superior imaging modality in acute and subacute settings in the detection of lacunar infarction. In the acute stage, the MRI diffusion- weighted image (DWI) has the most diagnostic accuracy. MRI-DWI helps to differentiate between acute and chronic infarction.[4] In an acute setting, on T1-weighted images, lacunes appear as focal areas of decreased signal intensity and as focal areas of hyperintensity on T2-weighted images. Chronic lesions are isointense to CSF on all sequences.

In cases where a neck angiogram is not done, carotid ultrasound helps diagnose an atherosclerotic narrowing of the extracranial carotid artery. The risk of stroke is higher in patients with severe carotid artery stenosis.

Extensive embolic workup, including echocardiography and vascular imaging evaluation, is very low yield in cases of lacunar stroke.[5]

Other immediate tests to be performed include blood glucose levels, electrocardiogram, complete blood count including platelets, troponin, prothrombin time, and international normalized ratio (INR), activated partial thromboplastin time, and a complete metabolic panel and lipid panel. These tests are helpful in the assessment of underlying stroke risk factors.

CONCLUSION

Patients need to be aware of risk factors that raise the risk of stroke. Compliance with antithrombotic agents to prevent the recurrence of stroke is essential. Patients has to maintain a healthy diet, exercise regularly, avoid smoking, and avoid excess alcohol use. All these habits reduce the risk of having strokes in general. If patients have high blood pressure, lipid disorder, or diabetes, regular follow- up with their doctor is essential to keep these risk factors optimally controlled.

Most patients with lacunar infarctions have significant improvement of neurologic deficits. Physical therapy, speech therapy, occupational therapy, and rehabilitation services remain essential after hospital care to regain maximum strength and functional level after stroke.

The timeline of recovery from lacunar stroke is different for everyone. Home safety is essential. Fall- risk due to physical disability is common.

Depression is common in people who have experienced a stroke and should be addressed if present. Cognitive impairment due to multiple subcortical strokes can progress to vascular dementia and should be monitored.

Conflict Of Interest: None to declare

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