

To study and identify clinical profile and risk factors in patients of lacunar infarcts – A cross sectional study

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Abstract

Background: Stroke remains the second leading cause of death after ischemic heart disease worldwide. Lacunar infarcts are small deep infarcts ranging from 2 to 20 mm in size resulting from occlusion of a penetrating artery which accounts for approximately 25% of all ischemic strokes.

Objective: To study clinical profile in patients of lacunar stroke and to identify risk factors of lacunar stroke

Materials and methods: A cross sectional observational study done at ARMCH Solapur over period of 2 yrs including 38 patients of lacunar stroke admitted in a hospital.

Result: Most common Risk factor for lacunar stroke among study subjects was Hypertension contributing 25(65.78%) followed by Smoking 19(50%), Obesity 17(44.73%), Physical Inactivity 16(42.10%), Alcohol consumption 16(42.10%), Diabetes Mellitus 14(36.84%), Dyslipidemia 13(34.21%), Prior TIA or stroke 12(31.57%) and known Ischemic heart disease in 5(13.15%) cases respectively. Most of study participants presented as Pure Motor contributing 18(47.16%) followed by Ataxic Hemiparesis 9(23.68%), Mixed Sensory Motor 5 (13.15%), Dysarthria and clumsy hand 3 (7.89%) and Pure Sensory 3 (7.89%) respectively.

Conclusion: Most of the study subjects with lacunar stroke were from 6th decade of life. Hypertension was most common risk factor followed by smoking, obesity,

alcohol consumption, dyslipidemias, DM and h/o prior TIA or stroke .Pure motor was most common clinical lacunar infarct syndrome followed by Ataxic Hemiparesis, Mixed Sensory Motor, Dysarthria and clumsy hand and Pure Sensory respectively.

Keywords: Lacunar Infarct, Dysarthria, Clumsy Hand, Sensory Motor.

Introduction

Stroke remains the second leading cause of death after ischemic heart disease worldwide^[1]. Early diagnosis and treatment is necessary to prevent mortality and morbidity^[2]. Stroke or cerebrovascular accident is a clinical syndrome and has been defined by the World Health Organization [WHO] as “rapidly developing clinical signs of focal [at times global] disturbance of cerebral function, lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin .” Lacunar infarcts are small deep infarcts ranging from 2 to 20 mm in size resulting from occlusion of a penetrating artery which accounts for approximately 25%

of all ischemic strokes. Each of five classical lacunar syndromes as described by Fischer has a relatively distinct symptom complex^[3]. Symptoms may occur suddenly , progressively, or in fluctuating [e.g the capsular warning Syndrome manner. Occasionally, cortical infarcts and intracranial hemorrhages can mimic lacunar Infarcts, but true cortical infarct signs [such as aphasia, neglect, and visual field defects] are always absent in lacunar strokes.

The five classic lacunar syndromes are as follows;^[4,5]

1. Pure motor stroke/hemiparesis
2. Ataxic hemiparesis
3. Dysarthria /clumsy hand
4. pure sensory stroke

5. mixed sensorimotor stroke

As Lacunar infarcts, possibly due to their lower incidence and better short term recovery, have been less studied in stroke hospital registries in spite their significant health impact . Thus there are still many controversial aspect about their natural history when compared to the rest of cerebral infarction such as risk factors and clinical profiles, so we will have to do this study.

Objectives

1. To study clinical profile In patients of lacunar stroke.
2. To identify risk factors of lacunar stroke.

Material and Methods

Study design: Cross sectional study

Study Population: All patients admitted in medical ward and ICU diagnosed with lacunar stroke from January 2021 to June 2022.

Sample Size: All the patients during one and half years of study who fulfill the inclusion criteria will form as sample for study.

Study Duration: Nov 2020 to Nov 2022.

Inclusion criteria

1. Patients of lacunar stroke above 18 years age.
2. Acute stroke syndrome and depiction of acute subcortical infarct on CT SCAN or MRI with maximally allowed axial diameter of 25 mm.

Exclusion Criteria

1. Concomitant acute cortical or cerebellar infarct or multiple acute subcortical infarct.
2. Sample size: Among 50 patients of ischemic stroke, about 40% of the patients had lacunar infarcts.
3. Sample size (N) = $4 \times P \times Q / L^2$

$$P = 40$$

$$Q = 100 - 40 = 60$$

L= 16% Absolute

$N=4 \times 40 \times 60 / 256$

N= 37.5

However 38 subjects were included in the study

Methods Data Collection and Questionnaire

Predesigned and pretested questionnaire was used. Questionnaires included general information such as age, sex, religion, occupation, residential address and date of admission,

CT scan / MRI of brain within 24 hrs of admission.

Data entry and analysis

The data were entered in Microsoft Excel and data analysis was done by using SPSS demo version 21 for windows. The analysis was done performed by using percentages in frequency tables and correction of lacunar infarct. Chi square test was used to association $p < 0.005$ was considered as level of significance using the chi square test.

Result and Observation

Table 1: Distribution of study participants according to age (N=38)

Age (Years)	Frequency	Percentage
≤40	4	10.52
41-50	6	15.78
51-60	18	47.36
>60	10	26.31
Total	38	100

Majority of study participants were from age group 51-60 years contributing 18(47.36%) followed by >60 years 10(26.31%), 41-50 years 6(15.78%) and 4(10.52%) were from ≤40 years respectively.

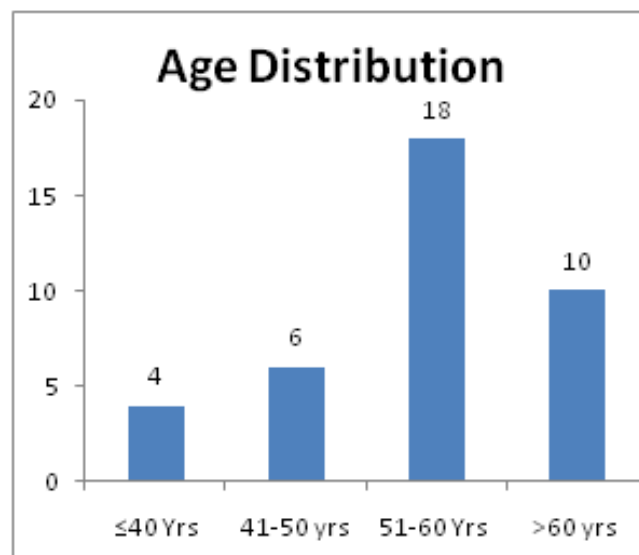


Figure 1: Distribution of study participants according to age (N=38)

Majority of study participants were C

Table 2: Distribution of study participants according to gender (N=38)

Sex	Frequency	Percentage
Male	24	63.15
Female	14	36.85
Total	38	100

Most of the study participants were males contributing 24(65.15%) and females 14(36.85%) .M:F ratio was 1.71:1. 40 years respectively.

Figure 2: Distribution of study participants according to gender (N=38)

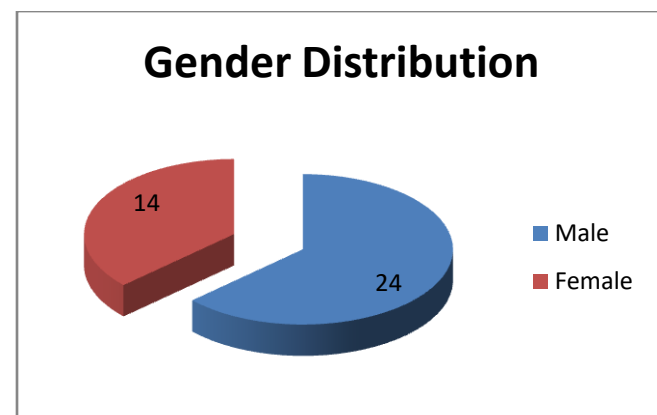


Table 3: Risk factor for lacunar stroke among study subjects (N=38)

Risk factor	Frequency	Percentage
Hypertension	25	65.78
Smoking	19	50
Obesity	17	44.73
Diabetes Mellitus	14	36.84
Dyslipedemia	13	34.21
Physical Inactivity	16	42.10
Alcohol consumption	16	42.10
Prior TIA or stroke	12	31.57
Ischemic heart disease	5	13.15

Most common Risk factor for lacunar stroke among study subjects was Hypertension contributing 25(65.78%) followed by Smoking 19(50%), Obesity 17(44.73%), Physical Inactivity 16(42.10%), Alcohol consumption 16(42.10%), Diabetes Mellitus 14(36.84%), Dyslipedemia 13(34.21%), Prior TIA or stroke 12(31.57%) and known Ischemic heart disease in 5(13.15%) cases respectively.

Figure 3: Risk factor for lacunar stroke among study subjects (N=38)

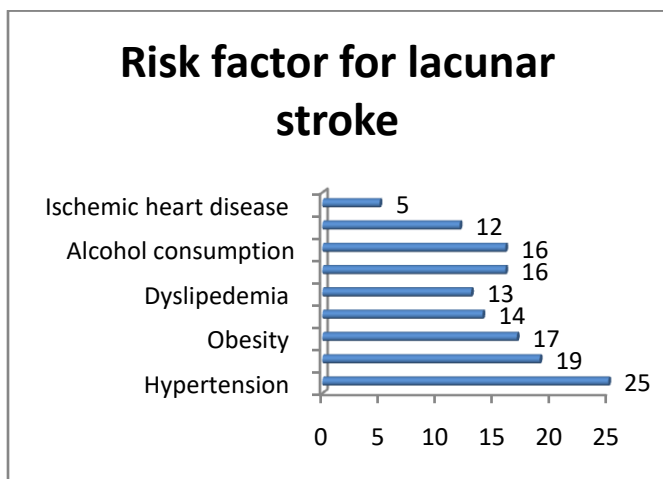
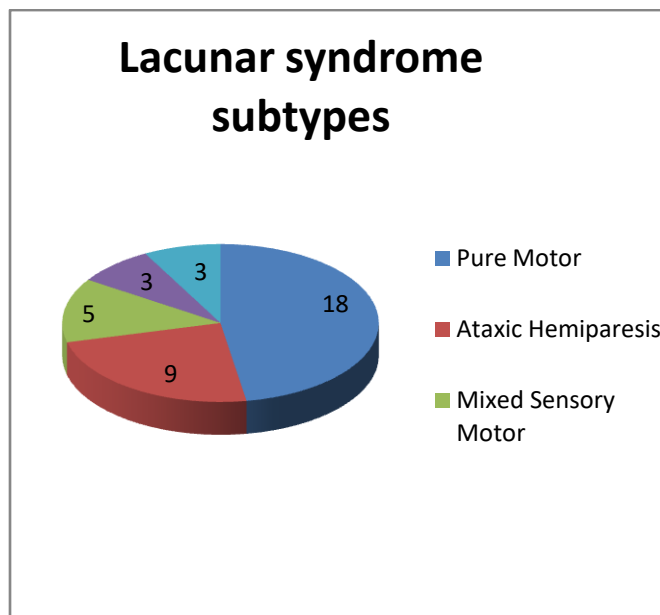


Table 7: Distribution of patients according to lacunar syndrome subtypes (N=38)

Subtype	Frequency	Percentage
Pure Motor	18	47.36
Ataxic Hemiparesis	9	23.68
Mixed Sensory Motor	5	13.15
Dysarthia and clumpsy hand	3	7.89
Pure Sensory	3	7.89

Most of study participants presented as Pure Motor contributing 18(47.16%) followed by Ataxic Hemiparesis 9(23.68%), Mixed Sensory Motor 5 (13.15%), Dysarthia and clumpsy hand 3 (7.89%) and Pure Sensory 3 (7.89%) respectively.



Discussion

Mean age of the study participants was 56 ±3.392 years Majority of study participants were from age group 51-60 years contributing 18(47.36%) followed by >60 years 10(26.31%), 41-50 years 6(15.78%) and 4(10.52%) were from ≤40 years respectively.[Table N0.1]

A similar study by Nair R et al⁶ revealed consistent finding with present study. It was seen that, Lacunar stroke occurred most frequently between the ages of 55 and 75, with mean age of 60.7 years. A study by Singh H et al⁷ found comparable findings. It was seen that, most of the patients of lacunar infarcts were of 6th decade of life. Another study by Kaul S et al⁹⁶ found that, mean age at presentation was 56.9 years.

Most of the study participants were males contributing 24(65.15%) and females 14(36.85%). M:F ratio was 1.71:1. [Table N0.2] A study by Nair R et al¹⁰⁵ found that, out of 132 patients, 75% were males. Another study by Kaul S et al⁸ found male to female ratio as 3.5:1.

Most common Risk factor for lacunar stroke among study subjects was Hypertension contributing 25(65.78%) followed by Smoking 19(50%), Obesity 17(44.73%), Physical Inactivity 16(42.10%), Alcohol consumption 16(42.10%), Diabetes Mellitus 14(36.84%), Dyslipidemia 13(34.21%), Prior TIA or stroke 12(31.57%) and known Ischemic heart disease in 5(13.15%) cases respectively. [Table No.3]

A similar study by Nair N et al⁹ shown that, Hypertension was present in 74.2% and 37.8% had diabetes mellitus, past history of stroke was present only in 7.5%. Cardiac abnormalities including ischemic heart disease was present in 6(4.5%), History of smoking was present in 38(28.8%), hyperlipidemia was present in 23 (17.4%) of patients. Another study by Kaul S et al⁹ found that, the common risk factors included hypertension(62%), diabetes(38%) and smoking(28%). Most of study participants presented as Pure Motor contributing 18(47.16%) followed by Ataxic Hemiparesis 9(23.68%), Mixed Sensory Motor 5 (13.15%), Dysarthria and clumsy hand 3 (7.89%) and Pure Sensory 3 (7.89%) respectively. [Table No.3] A

study by Nair R et al¹⁰ found that, Pure motor hemiparesis was the most common clinical syndrome accounting for 75% of patients, followed by ataxic hemiparesis 24.2%. Less common subtypes included sensory-motor 6.1%, pure sensory 3.0%, and dysarthria clumsy hand syndrome 3.8% in a of patients. Another studies by Gan R et al¹⁰⁹ and Donnan GA et al¹¹ found consistent findings with present study. It was observed that, prevalence of pure motor hemiparesis was found to be between 40-60%, and the ataxic hemiparesis ranged between 15-20%. Another study by Kaul S et al¹² found that, Pure motor hemiparesis was the presenting syndrome in 45% patients. Ataxic hemiparesis and sensorimotor stroke accounted for 18% each and dysarthria-clumsy hand syndrome for 14%.

Conclusion

Most of the study subjects with lacunar stroke were from 6th decade of life. Hypertension was most common risk factor followed by smoking, obesity, alcohol consumption, dyslipidaemias, DM and h/o prior TIA or stroke. Pure motor was most common clinical lacunar infarct syndrome followed by Ataxic Hemiparesis, Mixed Sensory Motor, Dysarthria and clumsy hand and Pure Sensory respectively.

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