



## A Comparative Study of Large Vessel Ischemic Stroke and Lacunar Stroke

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### Abstract

*Stroke is a global epidemic and an important cause of morbidity. Stroke or cerebrovascular accident is defined as abrupt onset of focal Neurological deficit which is attributable to a focal vascular cause. Ischemic stroke include large vessel Ischemic stroke and lacunar stroke.*

**Aim:** *To prove that incidence of lacunar stroke is more (>50%) in ischemic stroke and to find out any difference between risk factors for lacunar stroke and large vessel ischemic stroke.*

**Materials and Methods:** *A cross sectional study consisted of 255 patients with first episode of CT proven ischemic stroke during a period of 6 months in a tertiary care centre in south Kerala.*

**Results:** *Out of the 255 patients included in the study, 51.37% constituted lacunar stroke. Maximum number of stroke patients were in the age group 60-69 years (38% in the lacunar stroke group and 34% in the large vessel ischemic stroke group). Lacunar stroke was more in all age groups studied except 50-59 years and 80-89 years. Most common clinical presentation in both study groups were hemiparesis. 65% of stroke patients were hypertensive in both groups and it was the major risk factor in both study groups. 38% of large vessel ischemic stroke patients and 36% of the lacunar stroke patients were smokers which was the significant risk factor next to hypertension.*

**Conclusion:** *The study showed the incidence of lacunar stroke is more than 50% of the total ischemic stroke. Maximum number of stroke patients in the lacunar stroke group and large vessel ischemic stroke group were in the age group of 60-69 years. Most important risk factor is hypertension followed by smoking in both groups. There was no significant difference in risk factors between large vessel ischemic stroke and lacunar stroke.*

**Keywords:** *Lacunar stroke, Large vessel ischemic stroke.*

### Back ground

Stroke is an important cause of morbidity which ranks next to cardiovascular and cancer as a cause of death. Stroke or cerebrovascular accidents is defined as abrupt onset of focal Neurological

deficit which is attributable to a focal vascular cause. It can be ischemic stroke, hemorrhagic stroke and embolic stroke.

Cerebral ischemia is caused by reduction in blood flow that lasts longer than several seconds. If

cessation of flow lasts more than a few minutes, infarction or death of brain tissue results. The cause of this reduction in blood flow in ischemic stroke is usually caused by thrombosis of cerebral vessels themselves or by emboli from proximal arterial source or from the heart. The pathological process for occlusion of vessel is due to atherosclerosis, hypertensive arteriosclerotic change or arteritis.

Manifestations of stroke are by the abrupt onset of a focal neurological deficit-from seconds to minutes or hours. Ischemic stroke includes large vessel ischemic stroke and lacunar stroke. Large vessel ischemic stroke involves carotid system or vertebrobasilar system. The clinical presentations of large vessel ischemic stroke, depending up on the site of obstruction, hemiplegia with or without various combinations of aphasia, sensory deficits, gaze paralysis, ataxia, apraxia, choreoathetosis, cranial nerve palsies and alterations in mentation including coma.

Lacunar stroke is due to occlusion of small penetrating branches of cerebral arteries and the resulting infarcts may be so small or so situated as to cause no symptoms whatsoever. As the softened tissue is removed, it leaves a small cavity or lacune. It is due to the occlusion of small arteries 50-200mm in diameter. The pathological process is due to atheroma or thrombosis at the mouth of branch vessel, and less often embolic occlusion of small vessels and lipohyalin degeneration and occlusion in the initial course of small vessels. The size of lacune may vary from 3mm to 15mm in diameter. Usual site of lacunar infarct in the order of frequency include putamen and caudate nuclei, thalamus, basis pontis, internal capsule and deep hemispherical white matter. The usual presentations are pure aphasia, pure sensory stroke, dysarthria-clumsy hand syndrome and ipsilateral hemisphere ataxia. Multiple lacunar infarcts involving corticospinal and corticobulbar tracts are by far the most common cause of pseudobulbar palsy. Other presentations are multi-infarct dementia or gait disorders when lacunes occurring in both hemispheres.

### Objectives of the Study

1. To prove that the incidence of lacunar stroke is more (>50%) in ischemic stroke.
2. To find out any difference between the risk factors for lacunar stroke and large vessel ischemic stroke.

### Materials & Methods

#### Study population

Study population consisted of a total of 255 patients who attended the medicine outpatient clinic, medicine casualty and admitted in the medical wards, with first episode of CT proven ischemic stroke during a period of 6 months in a tertiary care centre in South Kerala.

#### Study design

A cross sectional study of ischemic stroke comparing large vessel ischemic stroke and lacunar stroke.

#### Inclusion criteria

- (1) Patients who presented with first episode of ischemic stroke
- (2) CT scan proven infarct

#### Exclusion criteria

- (1) Patients with previous history of stroke
- (2) Patients with clinical features suggestive of ischemic stroke who are CT negative
- (3) Patients who could not afford to do CT scan

#### Methods

All patients admitted in our wards and presented in our outpatient clinic and casualty with clinical features suggestive of first episode of ischemic stroke and CT scan showing definite infarct, over a period of 6 months were included in the study. A detailed clinical history including history of hypertension, diabetes mellitus, coronary artery disease, hypercholesterolemia, smoking and alcohol intake, family history of hypertension, diabetes mellitus, cerebrovascular accident, hypercholesterolemia, coronary artery disease were obtained. Detailed clinical examination with emphasis on neurological deficit has been done. CT scan done for all patients included in the study. The results were analysed using  $X^2$  test.

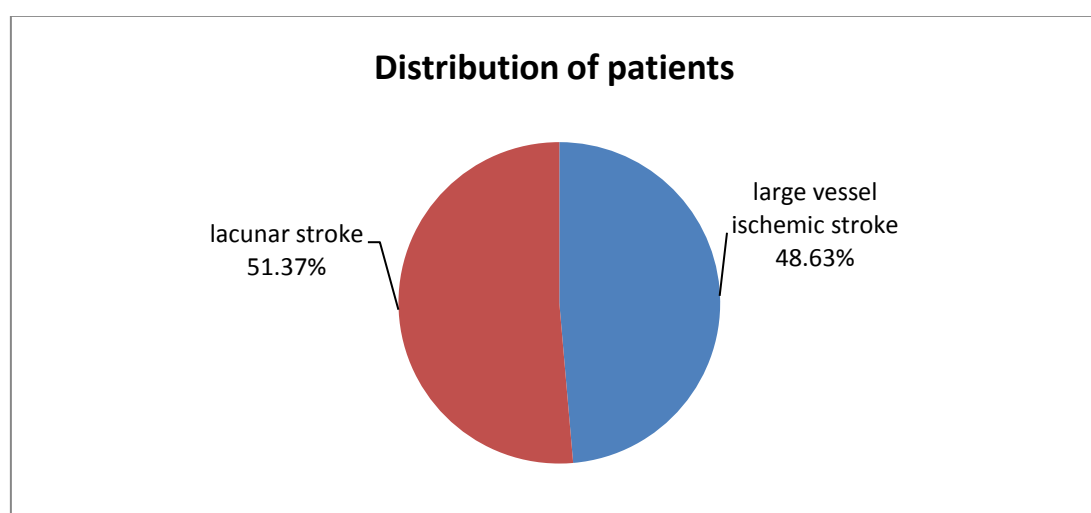
**Drawback of the study**

CT scan may not pick all the infarction in the brain especially those in the brainstem for which MRI is the ideal investigation of the choice. CT scans obtained in the first several hours after an infarction generally shows no abnormality and the infarct may not be seen reliably. So CT scan done

too early after the occurrence of stroke may be negative. CT scan may fail to show small ischemic strokes in the posterior cranial fossa because of bone artifact, small infarct on the cortical surface may also be missed. These cases could not be included in our study.

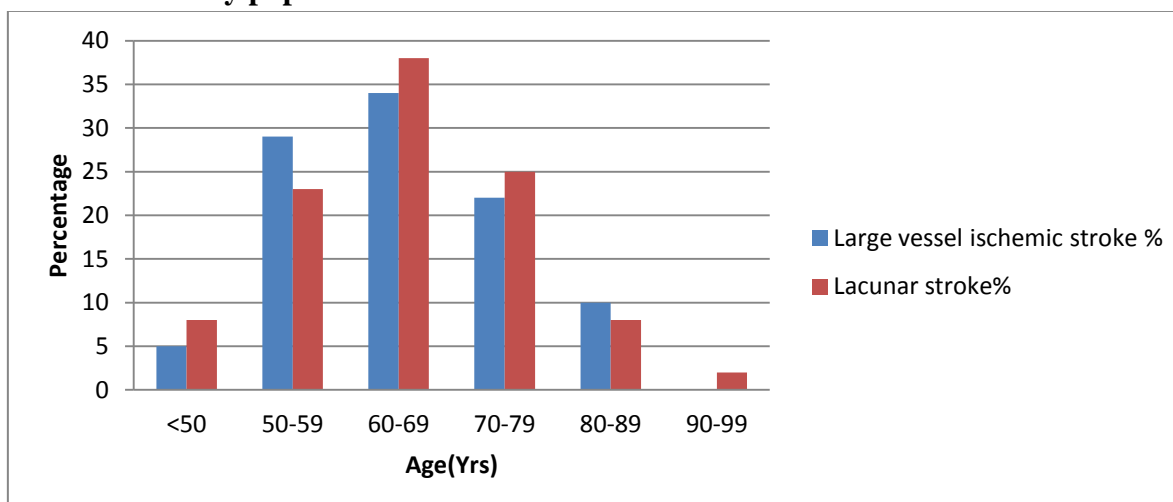
**Observations & Results****Distribution of patients in the study population**

	No.of patients	%
Large vessel ischemic stroke	124	48.63
Lacunar stroke	131	51.37
Total	255	100



A total of 255 patients presented with CT proven ischemic infarct were studied out of which, 124 patients had large vessel ischemic infarct and 131 patients had lacunar infarct. Lacunar stroke

constituted 51.37%. Of the 124 patients in the large vessel ischemic stroke group, 65% were males whereas in the lacunar stroke group, 62% were males.

**Age distribution of study population**

Maximum number of cases in both large vessel ischemic stroke and lacunar stroke were in the age group 60-69 years. In the lacunar stroke it was 38% and large vessel ischemic stroke 34%.

Lacunar stroke was slightly more in all age groups except in 50-59 years and 80-89 years, where large vessel ischemic stroke was 28% and 10% and lacunar stroke was 22% and 8% respectively.

### Clinical Presentation

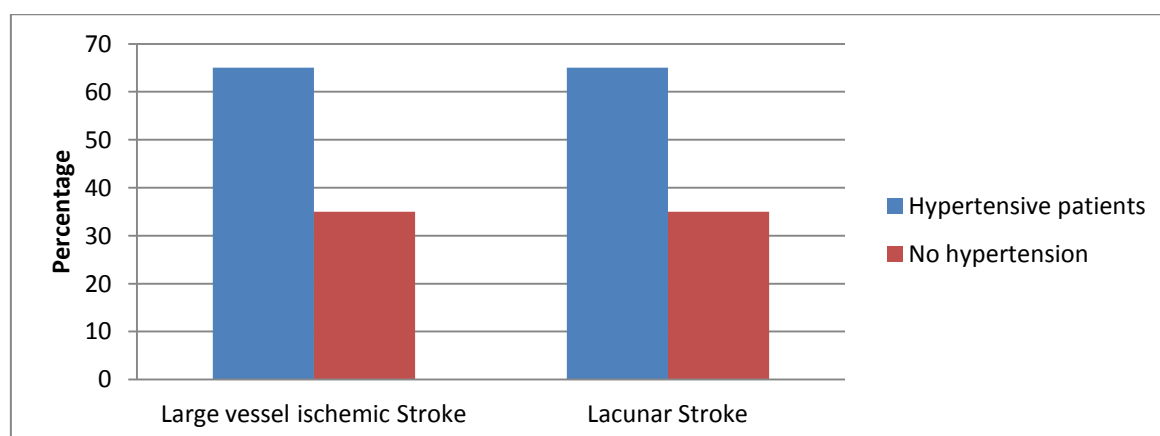
	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Right Hemiparesis	50	40.32%	55	41.98%
Left Hemiparesis	51	41.13%	41	31.30%
DCHS	2	1.61%	8	6.11%
Altered sensorium	1	0.81%	8	6.11%
Seizures	3	2.42%	4	3.06%
Aphasia	3	2.42%	2	1.53%
Hemianopia	1	0.81%	0	0.00%
Ataxia	8	6.45%	4	3.05%
Gerstmann Syndrome	1	0.81%	0	0.00%
Vertigo	1	0.81%	1	0.76%
Dysarthria	3	2.42%	1	0.76%
Sensory Stroke	0	0.00%	4	3.05%
Chorea	0	0.00%	1	0.76%
Monoparesis	0	0.00%	1	0.76%
Ataxic Hemiparesis	0	0.00%	1	0.76%
<b>Total</b>	<b>124</b>	<b>100%</b>	<b>131</b>	<b>100%</b>

In the large vessel ischemic stroke 40.32% of patients presented with right hemiparesis and 41.13% presented with left hemiparesis whereas in lacunar stroke 41.98% presented with right hemiparesis and 31.29% with left hemiparesis. Dysarthria clumsy hand syndrome (DCHS) was

more in the lacunar stroke (6.11% vs 1.61%). 4 cases of sensory stroke (3.05%), 1 case of chorea (0.76%), 1 case of Monoparesis (0.76%) and 1 case of Ataxic hemiparesis (0.76%) were present in the lacunar stroke group whereas none were present in the large vessel ischemic group.

### Hypertension

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Hypertensive patients	80	65	85	65
No hypertension	44	35	46	35
<b>Total stroke patients</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>



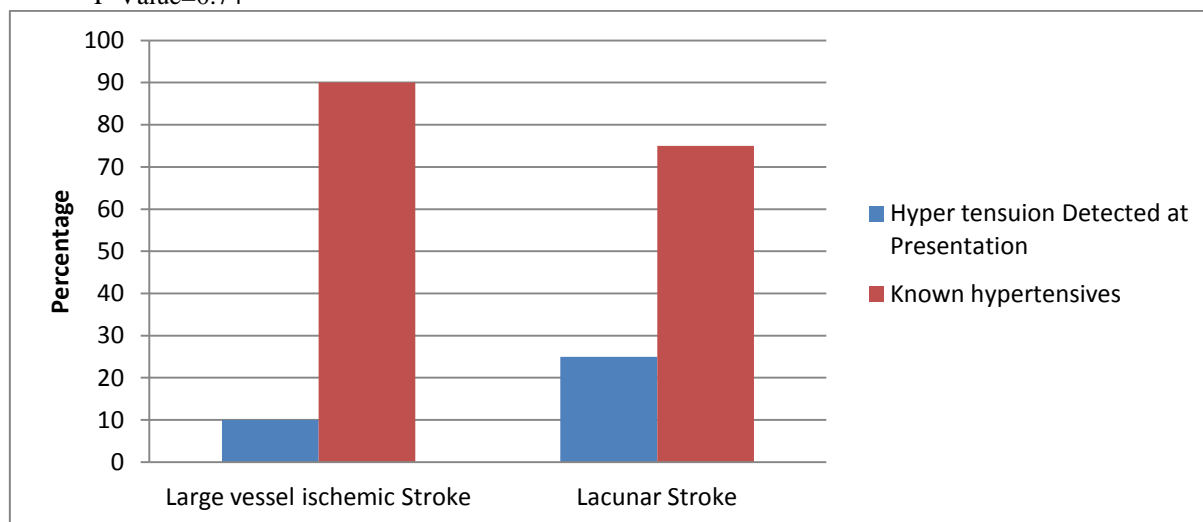
65% of stroke patients had hypertension in both large vessel ischemic stroke and lacunar stroke groups.

**Hypertension detected at the time of presentation**

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Hyper tension Detected at Presentation	8	10	21	25
Known hypertensive	72	90	64	75
<b>Total</b>	<b>80</b>	100	<b>85</b>	100

X<sup>2</sup>-Value=0.1101

P-Value=0.74



Out of the 80 patients with hypertension in the large vessel ischemic stroke, 72 patients (90%) were known hypertensive where as out of the 85

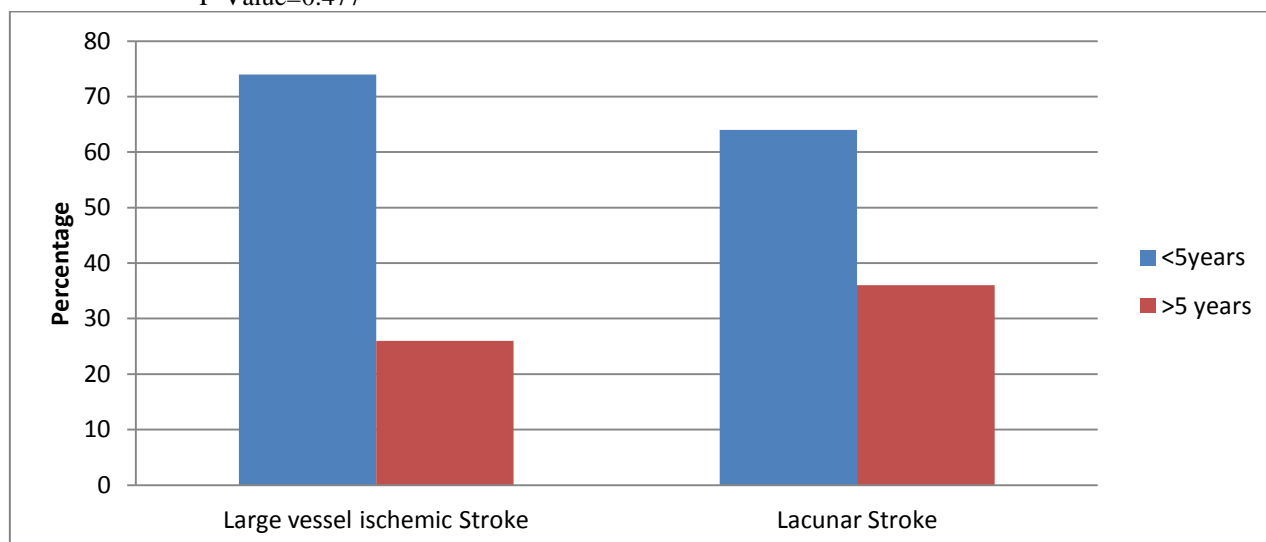
patients with hypertension, 64 patients(75%) were known hypertensive.

**Hypertension-Duration**

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
<5years	53	74	41	64
>5 years	19	26	23	36
<b>Total</b>	<b>72</b>	100	<b>64</b>	100

X<sup>2</sup>-Value=0.5053

P-Value=0.477



Out of the 72 hypertensive patients with large vessel ischemic stroke, 26% of patients were had hypertension of more than 5 years where as out of

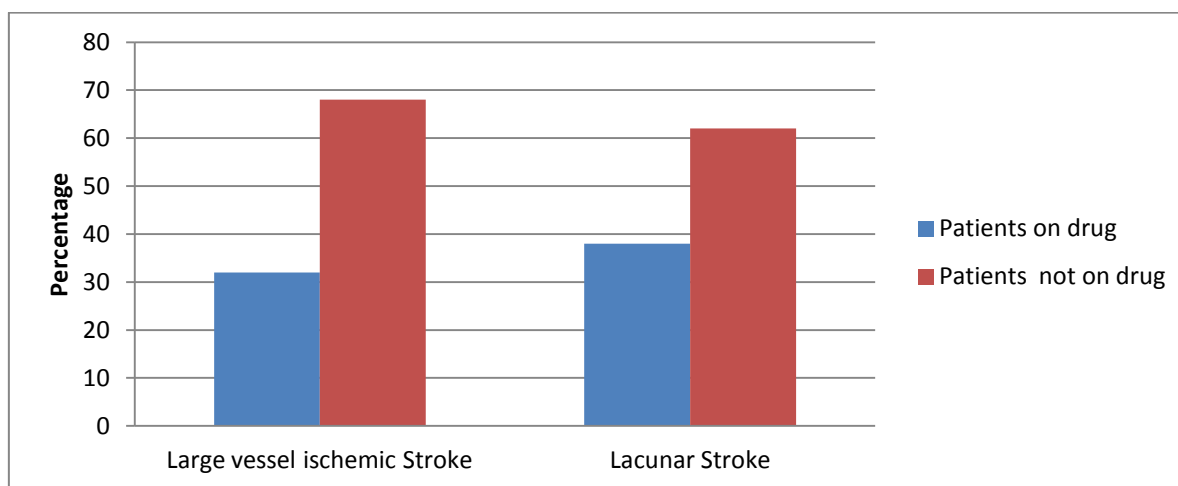
the 64 patients in the lacunar stroke, 36% were had hypertension of more than 5 years.

### Effect of antihypertensive drugs on stroke

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Patients on drug	23	32	24	38
Patients not on drug	49	68	40	62
<b>Total</b>	<b>72</b>	<b>100</b>	<b>64</b>	<b>100</b>

$X^2$  -Value=0.8515

P-Value=0.356

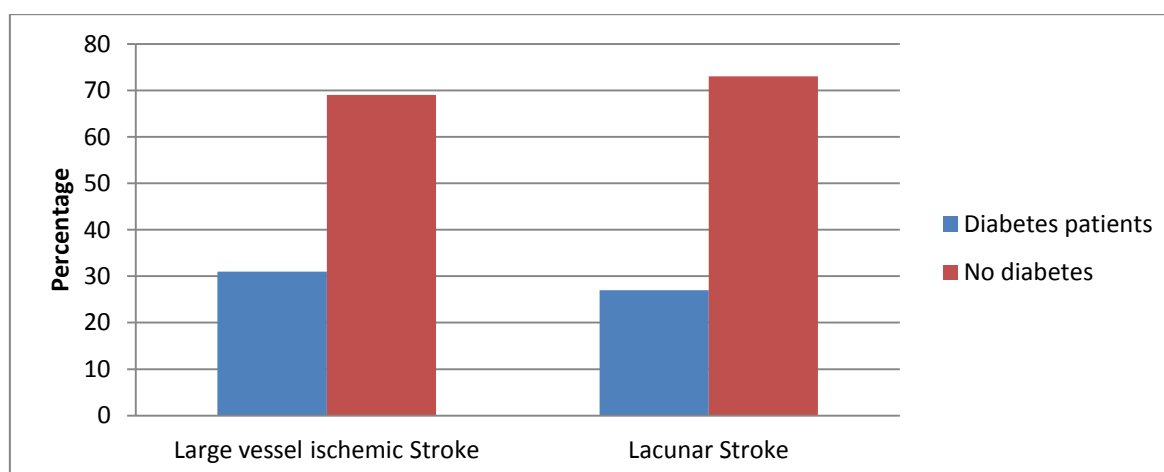


Out of the 72 patients, 68% of patients in the large vessel ischemic stroke group were not on any drugs prior to the occurrence of the stroke

whereas in the lacunar stroke group, out of the 64 patients, 62% of the patients were not on any drugs.

### Diabetes Mellitus

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Diabetes patients	38	31	36	27
No diabetes	86	69	95	73
<b>Total stroke patients</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>



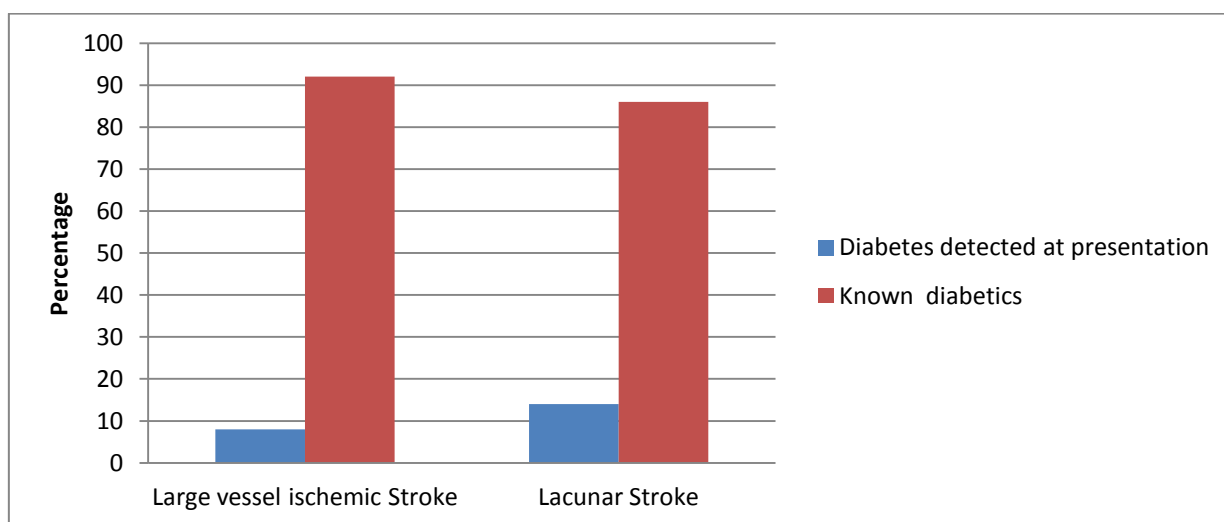
31% of the large vessel ischemic stroke patients were diabetic. patients were diabetic. were diabetic whereas 27% of the lacunar stroke

#### Diabetes Mellitus detected at the time of presentation

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Diabetes detected at presentation	3	8	5	14
Known diabetics	35	92	31	86
<b>Total</b>	<b>38</b>	<b>100</b>	<b>36</b>	<b>100</b>

$X^2$  -Value=0.6065

P-Value=0.436

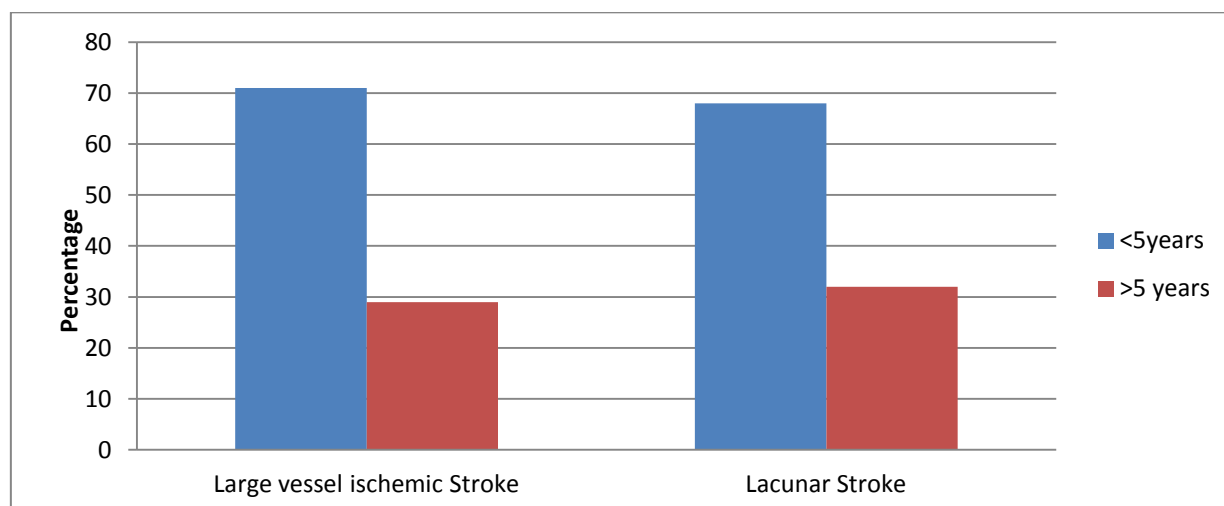


92% of the diabetic patients with large vessel ischemic stroke group were detected at the time of occurrence of stroke whereas 86% of the lacunar

stroke patients were detected at the time of presentation.

#### Diabetes Mellitus-Duration

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
<5years	25	71	21	68
>5 years	10	29	10	32
<b>Total</b>	<b>35</b>	<b>100</b>	<b>31</b>	<b>100</b>



Out of the 35 diabetic patients with large vessel ischemic stroke, 29% of patients had diabetes of more than 5 years whereas out of the 31 patients,

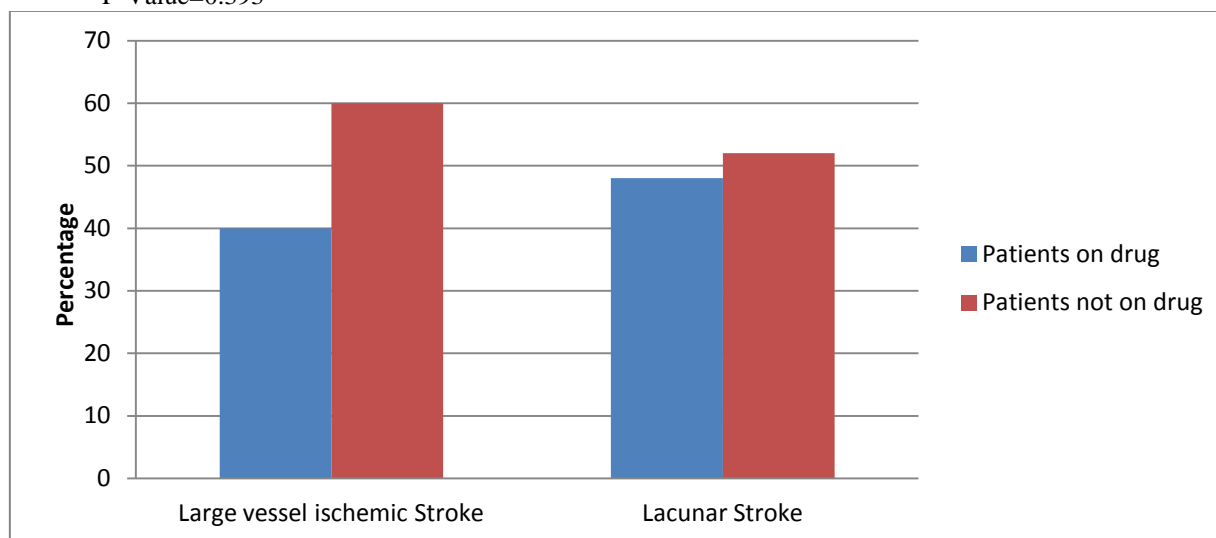
32% had diabetes of more than 5 years in the lacunar stroke.

### Effect of Treatment of diabetes patients on stroke

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Patients on drug	14	40	15	48
Patients not on drug	21	60	16	52
<b>Total</b>	<b>35</b>	<b>100</b>	<b>31</b>	<b>100</b>

$X^2$ -Value=0.729

P-Value=0.393

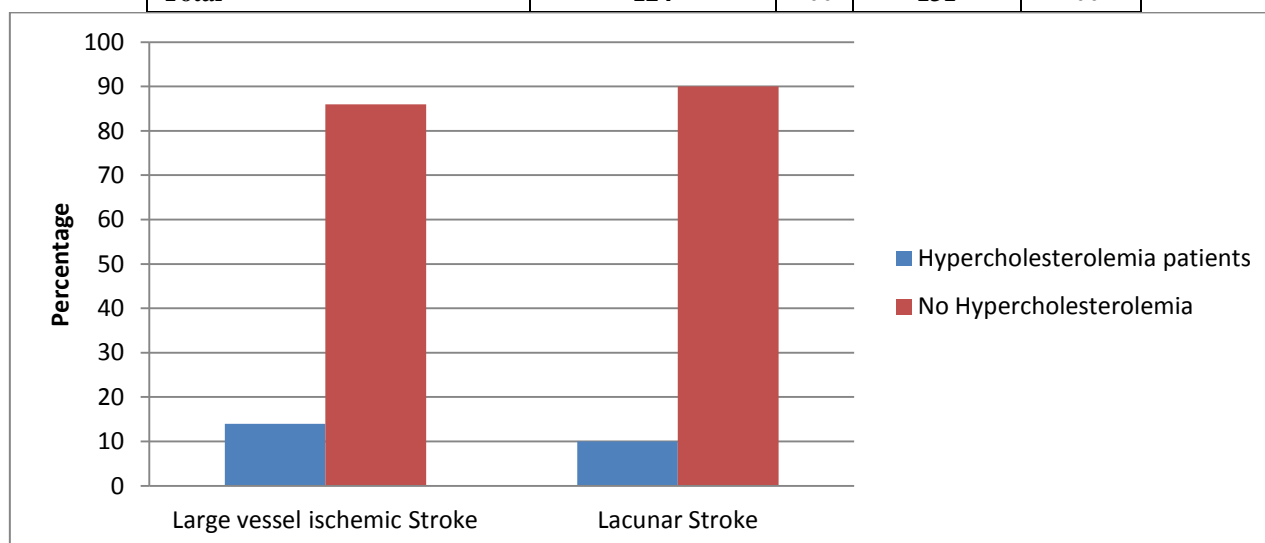


60% of diabetic patients in the large vessel ischemic stroke group and 52% of the diabetic

patients with the lacunar stroke group were not on any drugs

### Hypercholesterolemia

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Hypercholesterolemia patients	17	14	13	10
No Hypercholesterolemia	107	86	118	90
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>





Hypercholesterolemia was present in 17 patients (14%) of large vessel ischemic stroke group and

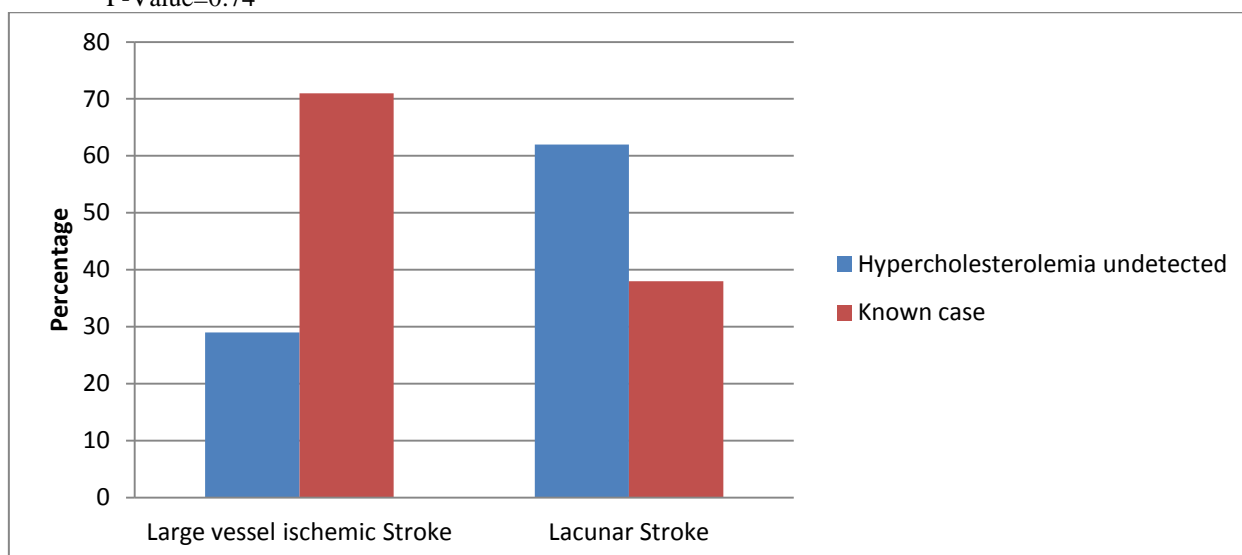
13 patients (10%) of the lacunar stroke group.

### Hypercholesterolemia detected at the time of presentation

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Hypercholesterolemia undetected	5	29	8	62
Known case	12	71	5	38
<b>Total</b>	<b>17</b>	<b>100</b>	<b>13</b>	<b>100</b>

$X^2$  -Value=0.1101

P-Value=0.74

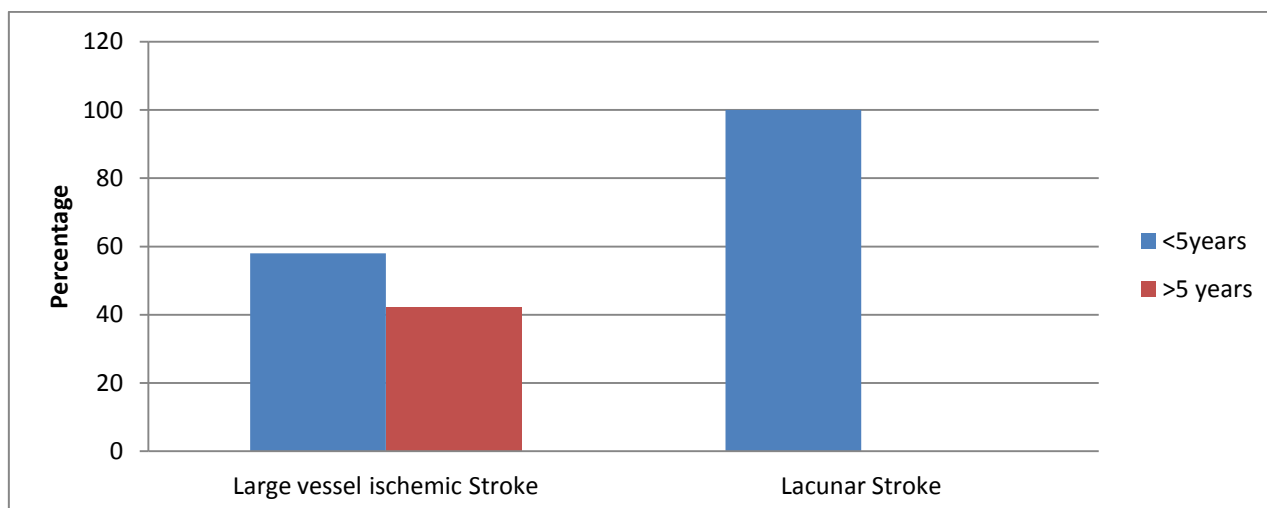


Previous history of hypercholesterolemia was present in 12 patients (71%) in the large vessel

ischemic stroke group and 5 patients (38%) in the lacunar stroke group.

### Hypercholesterolemia –Duration

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
<5years	7	58	5	100
>5 years	5	42	0	0
<b>Total</b>	<b>12</b>	<b>100</b>	<b>5</b>	<b>100</b>

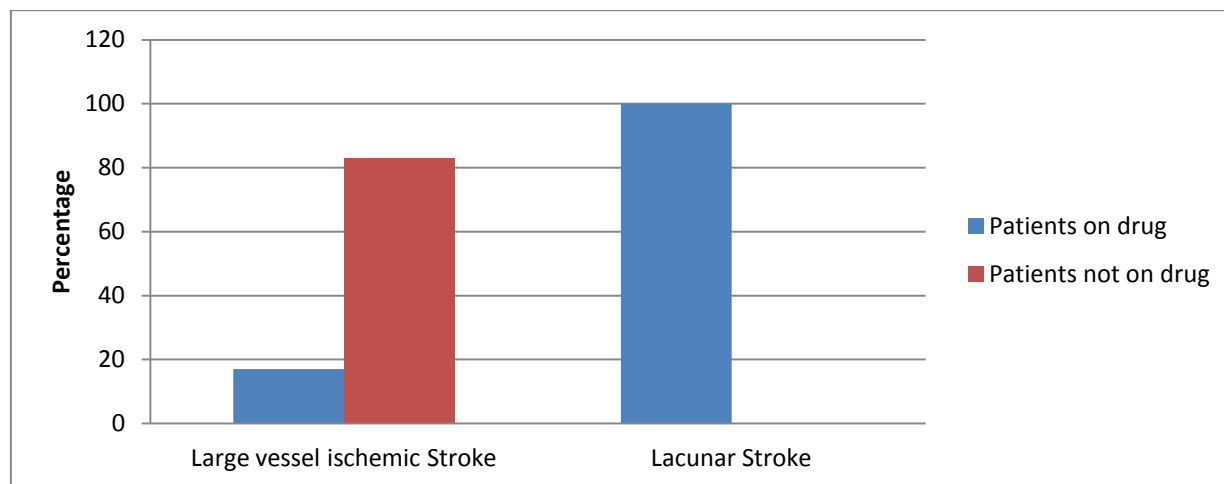


Out of the total 12 patients with known hypercholesterolemia in the large vessel group, 5 patients (42%) had hypercholesterolemia of more

than 5 years whereas in lacunar stroke group, all 5 patients (100%) were having hypercholesterolemia of more than 5 years.

### Effect of Treatment of Hypercholesterolemia patients on stroke

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Patients on drug	2	17	5	100
Patients not on drug	10	83	0	0
<b>Total</b>	<b>12</b>	<b>100</b>	<b>5</b>	<b>100</b>



Out of the 12 patients, 10 patients (83%) in the large vessel ischemic group were not on any drugs

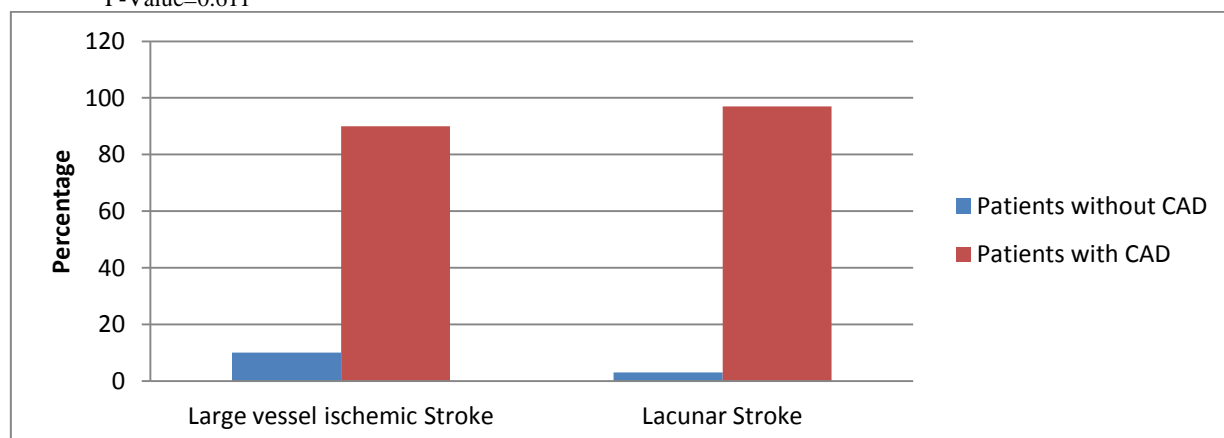
whereas in the lacunar group, all 5 patients (100%) were on drugs.

### Association of Coronary artery disease with stroke

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Patients with CAD	13	10	4	3
Patients without CAD	111	90	127	97
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>

$X^2$ -Value=0.258

P-Value=0.611



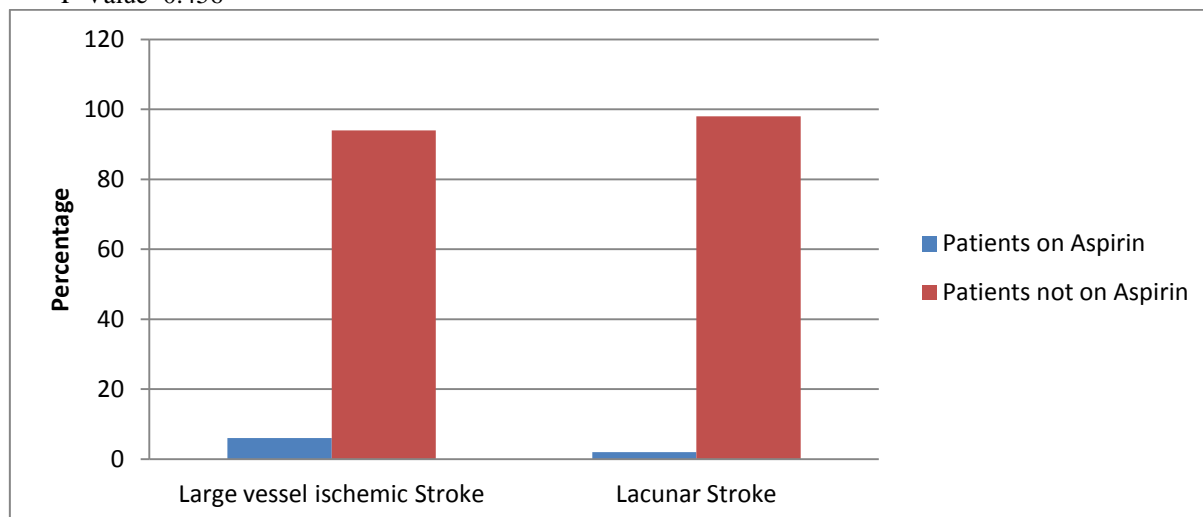
13 patients (10%) of large vessel ischemic group and 4 patients (3%) of the lacunar group had coronary artery disease.

**Effect of Aspirin on stroke**

	<b>Large vessel ischemic Stroke</b>	<b>%</b>	<b>Lacunar Stroke</b>	<b>%</b>
Patients on Aspirin	8	6	3	2
Patients not on Aspirin	116	94	128	98
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>

 $\chi^2$ -Value=0.555

P-Value=0.456

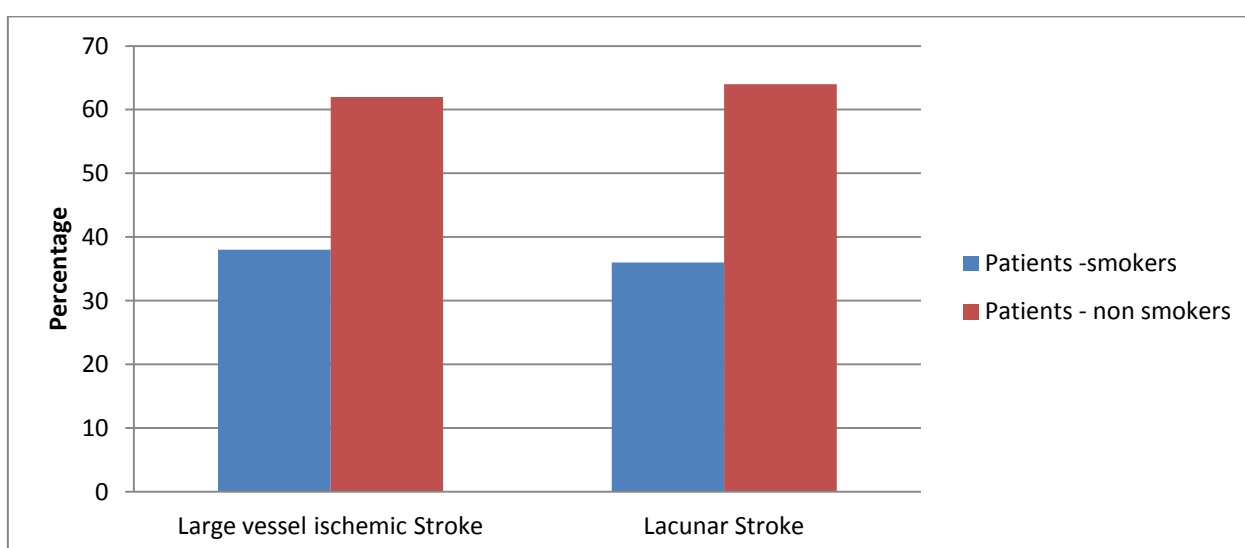


8 patients (6%) in the large vessel ischemic stroke group and 3 patients (2%) in the lacunar stroke

group were on aspirin for various indications previously

**Association of smoking and stroke**

	<b>Large vessel ischemic Stroke</b>	<b>%</b>	<b>Lacunar Stroke</b>	<b>%</b>
Patients -smokers	47	38	47	36
Patients - non smokers	77	62	84	64
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>

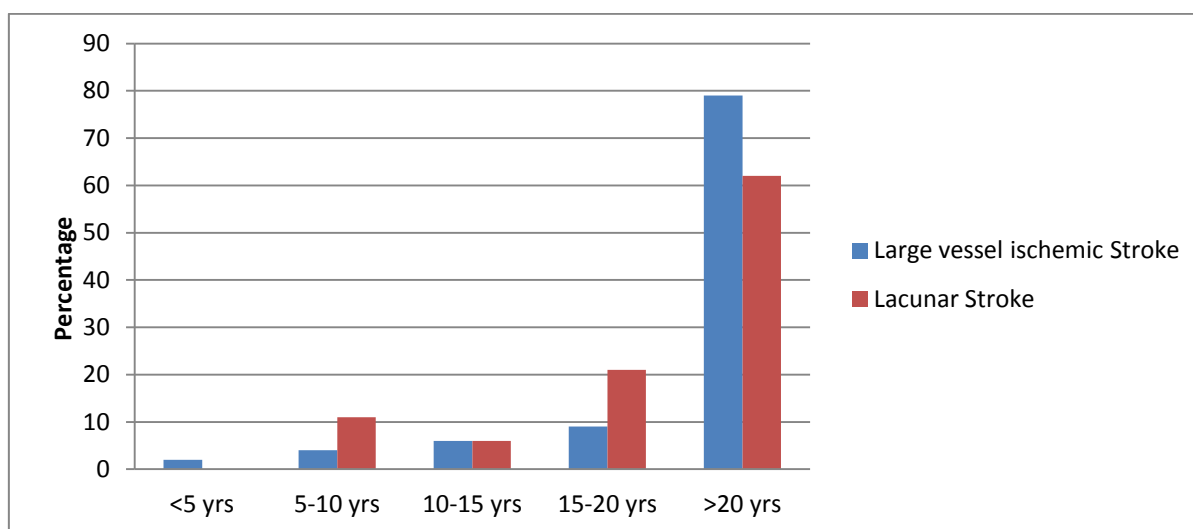


Out of the 124 patients, 47 patients (38%) were smokers in the large vessel ischemic stroke group

and out of 131 patients in the lacunar group, 47 patients (36%) were smokers.

**Relation of Duration of smoking with stroke**

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
<5 yrs	1	2	0	0
5-10 yrs	2	4	5	11
10-15 yrs	3	6	3	6
15-20 yrs	4	9	10	21
>20 yrs	37	79	29	62
<b>Total</b>	<b>47</b>	<b>100</b>	<b>47</b>	<b>100</b>

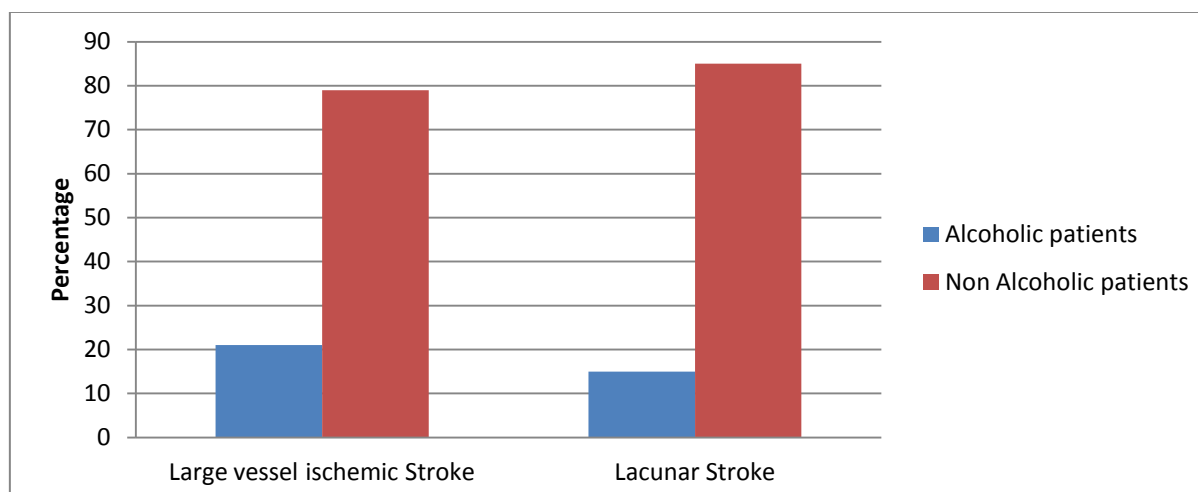


Out of the 47 smokers, 37 patients (79%) were smokers for >20 years in the large vessel ischemic stroke group and out of 47 smokers in the lacunar

stroke group, 29 patients (62%) were smokers for >20 years.

**Effect of alcohol on stroke**

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Alcoholic patients	26	21	20	15
Non Alcoholic patients	98	79	111	85
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>



26 patients (21%) of the large vessel ischemic stroke group were alcoholic and 20 patients (15%) in the lacunar stroke group.

### Relation of duration of alcohol with stroke

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
<5 yrs	0	0	0	0
5-10 yrs	0	0	1	5
10-15 yrs	1	4	0	0
15-20 yrs	1	4	3	15
>20 yrs	16	62	8	40
Occasional alcoholics	8	30	8	40
<b>Total</b>	<b>26</b>	<b>100</b>	<b>20</b>	<b>100</b>

Among alcoholics, maximum incidence of stroke occurred in patients who were alcoholics for >20

years .ie.62% in large vessel ischemic stroke group and 40% in lacunar stroke group.

### Family history

	Large vessel ischemic Stroke(Total patients-124 nos)	%	Lacunar Stroke(Total patients-131 nos)	%
Hypertension	7	6	10	8
Diabetes mellitus	5	4	9	7
Hypercholesterolemia	0	0	0	0
Coronary artery disease	1	1	1	1
Cerebrovascular accidents (CVA)	7	6	4	3

Among 124 patients in the large vessel ischemic stroke group, 6% had family history of hypertension, 4% had family history of diabetes mellitus, 1% had family history of coronary artery

disease and 6% had family history of CVA. Among 131 patients in the lacunar group, 8% had hypertension, 7% had diabetes mellitus, 1% had coronary artery disease and 3% had CVA.

### CT scan findings in study population

	Large vessel ischemic Stroke	%	Lacunar Stroke	%
Single infarct	85	69	84	64
Multiple infarct	35	28	47	36
Massive infarct	4	3	0	0
<b>Total</b>	<b>124</b>	<b>100</b>	<b>131</b>	<b>100</b>

Out of the 124 patients with large vessel ischemic stroke, 85 patients ie. 69% had single infarct, 35 patients.ie.28% had multiple infarcts and 4 patients ie. 3% had massive infarction. Out of the 131 patients in the lacunar stroke group, 84 patients i.e 64% had single infarct and 47 patients i.e 36% had multiple infarcts.

### Discussion

The study conducted in the Department of Medicine, in a tertiary care centre in South Kerala, in patients who presented with first episode of CT scan proven infarction during a period of six months. Patients with previous history of stroke and patients presented with clinical features

suggestive of ischemic stroke but CT scan negative and those who could not afford to do CT scan were excluded from the study. Detailed clinical examination and relevant investigations were done. The study was undertaken to prove that the incidence of lacunar stroke is more (>50% in ischemic stroke) and to find out any difference between the risk factors for lacunar stroke and large vessel ischemic stroke.

Out of the 255 patients included in the study, 51.37% constitute lacunar stroke. According to most of the literatures and text books, the incidence of lacunar stroke is between 20-30%. But one study conducted by A.Arboix *et al*<sup>15</sup> in acute isolated capsular stroke found that the lacunar stroke was the most frequent clinical presentation in ischemic stroke.

Yacoub Bahou<sup>18</sup> *et al* reported in their study that most common sub type of stroke was lacunar-51% which is similar to our study.

In the large vessel ischemic group, 65% of patients were males and in the lacunar stroke group, 62% were males. There was no statistically significant difference in sex distribution between these two groups. Maximum number of stroke patients in both groups were in the age group 60-69 years (38% in the lacunar group vs 34% in the large vessel group). Lacunar stroke was more in all age groups studied except in the 50-59 years age group and 80-89 years age group. In 50-59 years age group, large vessel ischemic stroke was 28% and lacunar stroke 22% and in the 80-89 years, large vessel stroke was 10% and lacunar stroke was 8%. These differences were statistically not significant.

Most common clinical presentation in both study groups was hemiparesis. 40.32% of the patients presented with right hemiparesis and 41.12% presented with left hemiparesis in the large vessel group and 41.98% presented with right hemiparesis and 31.29% presented with left hemiparesis in the lacunar group. Dysarthria, clumsy hand syndrome (DCHS) was more in the lacunar stroke group compared to large vessel ischemic stroke (6.11% vs 1.61%). This

observation is similar to the observation by A.Arboix *et al*<sup>25</sup>, in which DCHS accounted for 1.9% of acute stroke and 6.1% of lacunar stroke. In our study, 3.05% sensory stroke, 0.76% chorea, 0.76% monoparesis, 0.76% ataxic hemiparesis were present in the lacunar stroke group where as none was present in the large vessel ischemic group.

65% of stroke patients were hypertensive in both groups and it was the major risk factor in both study groups. These observations are similar to the observations by A. Arboix *et al*<sup>11</sup>, L.M. Cupin *et al*<sup>9</sup> and H.M.Perry Jr *et al*<sup>16</sup>. Out of the 80 patients with hypertension, 90% were previously diagnosed hypertensive in the large vessel ischemic stroke group and out of 85 patients, 75% were previously diagnosed hypertensive in the lacunar stroke group. But this difference was statistically not significant. Duration of hypertension was >5 years in 26% of patients in the large vessel ischemic group and 36% in the lacunar group. Thus there was a slight increase in the occurrence of lacunar stroke with duration but this difference was statistically not significant. In patients with previous history of hypertension, 68% in the large vessel group and 62% in the lacunar group were not on any drug treatment and this difference was not significant statistically.

31% of the large vessel ischemic stroke patients and 27% of the lacunar stroke patients had diabetes mellitus, with no significant statistical correlation, and this observation is similar to the study report of L.M. Cupin *et al*<sup>9</sup>. But D.Inzitari *et al*<sup>7</sup> reported a significant association between diabetes mellitus and lacunar stroke. Out of the 38 patients with diabetes mellitus in the large vessel ischemic stroke, 92% were previously diagnosed cases whereas in the lacunar group out of the 36 patients, 86% were previously diagnosed cases. This difference is statically not significant.<sup>10</sup> patients (29%) in the large vessel group, 10 patients (32%) in the lacunar stroke group had diabetes mellitus for >5 years. 60% of diabetic patients in the large vessel ischemic group and 52% of the diabetic patients in the lacunar group were not on

any treatment of diabetes mellitus. These differences were also not statistically significant. Hypercholesterolemia was present in 14% of large vessel ischemic stroke group and 10% of the lacunar stroke group with no statistically significant association. This observation is similar to the study of *Antonio Araiz et al*<sup>8</sup> and *L.M.Cupin et al*<sup>9</sup>. But *D.Inzitari et al*<sup>7</sup> found out a significant relationship between Hypercholesterolemia and lacunar infarct. Previous history of Hypercholesterolemia was present in 71% of the total 17 patients in the large vessel ischemic group and 38% of the total 13 patients in the lacunar group without significant statistical relationship. Out of the total 12 patients with previous history of Hypercholesterolemia, 42% of the patients with duration of disease >5 years and in the lacunar group all 5 patients were <5 years duration. 83% of the large vessel ischemic stroke group patients (10 patients) with Hypercholesterolemia were not on treatment whereas in the lacunar stroke group, all 5 patients were on treatment.

Coronary artery disease was present in 10% of large vessel ischemic stroke group and 3% of lacunar stroke. But this difference is not statistically significant.

6% of the large vessel ischemic stroke patients and 2% of lacunar stroke patients were on Aspirin for various indications previously. Data showed no statistical significance.

38% of large vessel ischemic stroke patients and 36% of lacunar stroke patients were smokers, which was a significant risk factor next to hypertension. But there was no statistically significant difference between these two groups, similar to the observation of *Antonio Araiz et al*<sup>8</sup>. The incidence of stroke was more in patients who smoked >20 years in both study group. Out of the 47 smokers, 79% of patients were smokers for more than 20 years in the large vessel ischemic stroke group and out of 47 smokers in the lacunar stroke group, 62% of patients are smokers for more than 20 years. 21% of patients in the large vessel group and 15% of patients in the lacunar group were alcoholics. This difference was not

statistically significant. Maximum incidence of stroke occurred in patients who were alcoholic for >20 years in both groups.

Family history of hypertension was present in 6% large vessel ischemic stroke and 8% of lacunar stroke. Family history of diabetes mellitus was present in 4% and 7% respectively in large vessel ischemic stroke and lacunar stroke group. Family history of cerebrovascular accident was present in 6% of large vessel group and 3% of lacunar group.

Out of the 124 patients with large vessel ischemic stroke, 69% had single infarct, 28% had multiple infarcts and 3% had massive infarction. In lacunar stroke, 64% had single infarct and 36% had multiple infarcts.

### Conclusion

- 1) This study showed the incidence of lacunar stroke is more than 50% (51.37%) of the total ischemic stroke.
- 2) Maximum numbers of stroke patients were in the age group of 60-69 years in both large vessel stroke group and lacunar stroke group.
- 3) Hypertension is the most important risk factor in both groups. Stroke incidence was more in patients who are not taking drugs for hypertension.
- 4) Second common risk factor is smoking and the maximum incidence of stroke occurred in patients who smoked for more than 20 years and patients who consumed alcohol for more than 20 years.
- 5) There was no significant difference in risk factors between large vessel ischemic stroke and lacunar stroke like hypertension, diabetes mellitus, hypercholesterolemia, smoking, alcoholism and Coronary artery disease.
- 6) The actual incidence of lacunar stroke may be more than what we observed because of the exclusion criteria for the selection of patients. We excluded patients who presented with features of stroke who are CT scan negative, but small infarcts may not be visible in the CT scan and CT scan taken too early in the



disease also may be negative, in which MRI is the investigation of choice.

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