Research Article

A prospective observational study on the clinical profile of ischemic stroke in a tertiary care centre in Thrissur, Kerala

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Abstract

Introduction: India is facing an increasing burden of diseases like coronary artery disease and stroke. Another peculiarity is that the number of cases of stroke in the young is more when compared to the west. There are also discrepancies among the different states of India regarding the epidemiological and clinical features of stroke. The aim of this study was to gather information regarding the clinical profile of patients admitted with ischemic stroke in a tertiary care centre in Thrissur, a district in the state of Kerala. **Materials and Methods:** The study included 100 consecutive patients admitted with the diagnosis of ischemic stroke, in the medicine wards of Government Medical College Thrissur. Patients above the age of 18 years and those cases in which the diagnosis was confirmed by CT scan of the brain were included in the study. **Results:** The majority of the patients were above 65 years of age (63%) and among the elderly 34 (54%) belonged to the age group of 65-74 years. In the age group above 65 years there were more females than males. The most common risk factor for stroke was hypertension. In the age group above 65 years, majority of the females had high LDL cholesterol values (>100 mg %) p 0.02 OR 4.7 95% CI 1.38-15.9. **Conclusion:** Elderly females have a greater predilection for the occurrence of stroke. Hypertension is the most common risk factor for stroke. Elevated LDL cholesterol is observed more often in elderly females. Earlier interventions aimed at the risk factors may prevent the occurrence of stroke.

Key words: Clinical profile, ischemic stroke, lipid profile,risk factors

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Introduction

Stroke is a leading cause of mortality globally [1]. India is facing an increase in the prevalence of atherosclerotic risk factors like diabetes, hypertension and dyslipidemia. This has contributed to the increasing burden of diseases like coronary artery disease and stroke. Another peculiarity is that the number of cases of stroke in the young is more when compared to the west. This takes a huge toll on the economic front [2]. There are documented differences in the clinical profile of stroke in India compared to the other nations, like for example an increased incidence of hemorrhagic stroke when compared to ischemic stroke. There are also discrepancies among the different states of India regarding the epidemiological and clinical features of stroke. Thus it is important that we should have data regarding the clinical profile of stroke from different parts of India.

The aim of this study was to gather information regarding the clinical profile of patients admitted with ischemic stroke in a tertiary care centre in Thrissur, a district in the state of Kerala

Materials and Methods

The study included 100 consecutive patients admitted with the diagnosis of ischemic stroke, in the medicine wards of Government Medical College Thrissur, Kerala. Patients above the age of 18 years were

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included. Only those cases in which the diagnosis was confirmed by CT scan of the brain were included in the study. Patients who presented with transient ischemic attack, intracerebral hemorrhage, metabolic encephalopathy, venous infarct were excluded. The criteria for hypertension as a risk factor was a documented evidence of high blood pressure recording. Patient was taken as diabetic if there was previous history of diabetes or blood sugar value on admission was more than 200 mg%.Previous history of coronary artery disease was considered only if there was documentation of ischemic heart disease or electrocardiographic evidence of previous ischemia or reports of revascularization procedure. Previous stroke was considered if there was documented evidence or imaging modality showing infarct. Total cholesterol level more than 200mg%, triglyceride more than 150mg%, LDL cholesterol more than 100mg% and HDL cholesterol less than 40mg% was taken as abnormal. Serum creatinine more than 1.5mg% in male and more than 1.4mg% in female was taken as abnormal. Hemoglobin less than 12g% in male and less than 10g% in female was considered as anemia. Statistical analysis was done using SPSS software. Quantitative data were expressed as mean ± standard deviation. Qualitative data was expressed as percentages. The statistical tests used included chi square test. Continuous variables like blood sugar, cholesterol and others were converted into dichotomous variables and chi square test was applied to find out the significance of association.p value of less than 0.05 was taken as significant.

Results

Age- he mean age of the patients in this study was 67 ± 13 years. The majority of the patients were above 65 years of age (63%) and among the elderly 34(54%) belonged to the age group of 65-74 years and 21(33 %) were in the 75-84 year age group and 8(13 %) were in the age group >85 years.

Table-1: Showing age and sex wise distribution of patients

Age in years	Number(n)	Percentage (%)
<45	Total 6	6
	Male 5	83
	Female 1	17
45-64	Total 31	31
	Male 20	65
	Female 11	35
65-74	Total 34	34
	Male 14	41
	Female 20	59
75-84	Total 21	21
	Male 10	48
	Female 11	52
>85	Total 8	8
	Male 2	25
	Female 6	75

The mean age of males was 63 ±13 years while that in females was 70 ±11 years. In the age group above 65 years there were more females than males, while in the younger age group it was the males who outnumbered females p 0.02 RR 2.9 95%CI1.3-6.9

Table-2: Risk factors for ischemic stroke

Risk factors	Number(n)	Percentage (%)
Hypertension	83	83
Diabetes	47	47
Previous stroke	24	24
Previous coronary artery disease	13	13

The most common risk factor for stroke was hypertension, in all age groups and in both the sexes. Among the 45 patients with history of diabetes 19(42%) had blood sugar >200 mg%. Only 3 persons who were previously not diabetic had high blood sugar level on admission.

Table-3: Frequency of modes of presentation.

Mode of presentation	Number(n)	Percentage (%)
Right sided weakness	42	42
Left sided weakness	28	28
Altered level of consciousness	16	16
Vomiting	3	3
Ataxia	3	3
Others (aphasia, seizures)	8	8

Table 4: location of infarct.

Location of infarct	Number(n)	Percentage (%)
Cortex	33	33
Capsuloganglionic	41	41
Brainstem	4	4
Cerebellum	6	6
Thalamus	1	1

In 59% of cases there were lesions in multiple sites. In 21% of cases cerebral atrophy was evident on the CT scan.

Table 5: Mean value of the biochemical parameters.

Biochemical parameter	Mean value	Standard deviation
Hemoglobin	12.1 g%	2.3
Blood sugar	161 mg%	82
Creatinine	1.2 mg%	.8
Total cholesterol	201 mg%	51
LDL cholesterol	128mg%	43
Triglyceride	135 mg%	52
HDL cholesterol	46 mg%	19

Anemia was more common in females than in males LR 4.2 95% CI 1.06-17. The mean blood sugar level was 161 ± 82 mg%. Among the diabetics 42% had uncontrolled blood sugar levels (>200 mg%). The mean values of total cholesterol, LDL, triglyceride and HDL were 201 ±51 mg%, 128 ±43mg%, 135 ±52 mg% and 46 ± 19 mg% respectively.

In the age group above 65 years, majority of the females had high LDL cholesterol values (>100 mg %) p 0.02 OR 4.7 95% CI 1.38-15.9.There was no significant difference between the males and females in the other lipid fractions. An interesting observation was that among both sexes in the age group above 65 years more number of subjects had low triglyceride values (<150 mg%). 60% of elderly females had HDL cholesterol values >40 mg%. In the younger age group females also this difference in HDL was observed (75% had high HDL)

Discussion

Majority of the patients in this study were elderly people and among them the maximum number of patients were in the age group of 65-74 years. The age of onset of stroke in developing countries is believed to be younger when compared to developed countries [3]. According to Heart Disease and Stroke Statistics 2015 Update [4] there is a decline in the incidence of ischemic stroke in people aged more than 60 years while incidence in the age group of 45-59 years remains the same. In the studies from Bangalore the mean age was 54.5 years. Our data is similar to that of that from Trivandrum [5] where the mean age was 67 years.

Regarding the data on stroke in young subjects, there is a lack of uniformity in selecting the age criteria. The ages adopted as cut off vary from 30-45 years. Globally the incidence of stroke in the young ranges from <5% to 20%. In the Trivandrum study (2009) the incidence of stroke in the young <40 years was 3.8%. The data from Kolkata in 2007 showed the incidence to be 8.8%.In this study there were 6 patients less than 45 years of age (6%). In a recent study done in AIMS the incidence in the 18-45 year age group was 16.7% [6]. With respect to the mean age in both sexes our data (63 years in male and 70 years in females) is almost similar to the data from the rest of India [7], [8], [9].Western data says the weighted mean age for men was 68.6 years, and 72.9 years for women [10]. Thus overall strokes occur at a younger age in males and females in India when compared to the western world.

As age advances there are more females with ischemic stroke than males. This observation has also been made by study from Kolkata. [11] They attributed this finding to the uncontrolled hypertension in women. In the Trivandrum study [5] males had higher incidence for stroke after standardizing for age. Our data on age and sex in ischemic stroke is similar to the data in the 2015 US update [4].

The most common risk factor in this cohort was hypertension, in both the sexes and across all age groups. This was observed by other studies from different parts of the country [12]. Hypertension affects around 25-40% of the adult Indian population [13].

More efforts have to be made for the early detection and treatment of risk factors especially hypertension, in order to reduce the incidence of stroke in our country. Early interventions have been known to produce 80% reduction in risk [14].

Commonest mode of presentation was weakness followed by altered level of consciousness, tallying with the observations made by other studies done in India [12], [9].

Capsuloganglionic region was the most frequent site of lesion followed by cerebral cortex. 6% of cases was due to cerebellar infarction. In the majority of patients there was evidence of ischemia in multiple sites. Anemia was more common in females than males, across all age groups. A total cholesterol level >200 mg/dL and a triglyceride level >150 mg/dL was present in 57.5% and 23.8% of patients, respectively.

The predictive role of lipid profile as a stroke risk factor remains controversial [15] Among the elderly more females had LDL cholesterol >100mg% than males p 0.022 OR 4.69 95% CI 4.69-15.9. In the elderly group 60% and in the younger group 75% of females had HDL cholesterol >40 mg% p 0.4 The higher LDL levels in elderly females may be due to less frequent use of statins. There was no difference between males and females in the elderly age group with respect to total cholesterol or triglyceride or HDL cholesterol.

In the younger age group there was no difference between the two genders with respect to the lipid profile. An interesting observation was that among females with ischemic stroke there was a tendency towards high HDL cholesterol and in elderly females there was more number of subjects with low triglyceride.

This makes one ponder what is the effect the various lipid fractions have on the occurrence of stroke? Is the effect of triglyceride and HDL on stroke different from that on coronary artery disease?

Conclusion

Stroke occurs at an earlier age in our population when compared to the western world. Elderly females have a greater predilection for the occurrence of stroke.

Hypertension is the most common risk factor for stroke in all age groups and both the genders. Elevated LDL cholesterol is observed more often in elderly females than males. This points to the fact that in elderly people as a whole and especially in females proper control of hypertension and in the elderly females lowering of LDL cholesterol might help in preventing the occurrence of stroke.

The role of lipids in stroke needs further study to know the exact influence of each lipid component on the occurrence of stroke.

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