

STUDY OF STROKE IN PATIENTS OF RURAL MAHARASHTRA

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Abstract

Background: Intracranial atherosclerotic disease (ICAD) is the most common proximate mechanism of ischemic stroke globally. It must be treated meticulously to avoid infarction. **Materials and Methods:** 116 patients of different age groups were studied with MRA to rule out occlusion or lesion; the tropical distribution of infarction, clinical manifestations, and recurrence after treatment were also noted. **Result:** Clinical manifestations included 39 (33.6%) alcoholics, 93 (80%) with HTN, 25 (21.5%) with Homocysteine, 63 (54%) with DM, 35 (30%) with hyperlipidemia, 41 (35.3%) smokers, and 56 (48.2%) with HTN + DM, and 20 (17.2%) with HTN + DM + hyperlipidemia 9 (7.7%) HTN+ DM+ hyperlipidemia + smoking + alcohol The highest occlusion was 42 (36.2%) MCA, followed by PCA, and the least was VA + BA. The highest tropical distribution of infarction is 33 (28.4%), followed by cortical and subcortical 28 (24.1%) and 27 (23.2%) subcortical. **Conclusion:** The present study of stroke must be correlated with other morbidities like HTN, DM, coronary artery disease, and smoking and must be treated efficiently because little is known about measures for primary prevention of stroke disease.

INTRODUCTION

Ischemic stroke is a clinical syndrome caused by various mechanisms of cerebrovascular disease.^[1] The risk of intracranial atherosclerotic stenosis is one of the major causes of stroke in India and global patients.

Large vessels include the internal carotid artery (ICA), middle cerebral artery (MCA), posterior cerebral artery (PCA), vertebral artery (VA), and basilar artery.^[2] The co-morbidities of stroke in young adults are type II DM, hypertension, alcoholism, smoking, hyperlipidemia, and coronary artery disease.^[3]

It is also speculated that stroke suppressor genes activated antioxidants, such as peroxidase, a component of high-density lipoprotein, which acted predominantly in the intracranial arteries; hence, polymorphic expression of stroke accounts for variable susceptibility to intracranial disease.^[4] Hence an attempt is made to evaluate the strokes, especially in young adults of different age groups.

MATERIALS AND METHODS

116 patients were admitted to the Neuro-medicine department of JIU's IIMSR Medical College and Noor Hospital Warudi, Taluka-Badapur, Dist: Jalna, Maharashtra-431202 were studied.

Inclusion Criteria

Criteria: Diagnosis of ischemic stroke due to large intracranial atherosclerosis and their relative who gave consent in writing for the study were selected for the study.

Exclusion Criteria

Patients with organic mental disorders, arterial fibrillation, acute anterior wall ST elevation myocardial infarction < 30 days, mitral stenosis, intracardiac thrombus or vegetations, intracranial tumors, arteriovenous malformations, moyamoya disease, and arteritis were excluded from the study.

Method: The diagnosis of ischemic stroke due to large artery intracranial arteriosclerosis was made as per the TOAST (trial of ORG 10172 in acute stroke treatment) classification. Physical and neurological examinations were done; disease duration, laboratory findings, any complications, and treatment received were noted. The data was noted in pre-designed case record forms.

MRA (Magnetic Resonance Angiography) (GE systems 1.5 T) was done in all patients. Stenosis (segmental flow gap or luminal stenosis or occlusion) was assessed in proximal middle cerebral arteries, internal carotid arteries, VAS, and BA. The distribution of stenosis and occlusive lesions was noted. Patients were put on treatment with anti-platelet drugs in addition to other required medications.

HTN (hypertension) history of HTN in the post, systolic blood pressure (SBP) ≤ 140 mm/Hg and/or

diastolic blood pressure \leq 90 mm/Hg, diabetes mellitus (DM)—history of DM Fasting blood glucose $>$ 126 mg/dl or 2-h postprandial blood glucose $>$ 200 mg/dl. HbA1C $>$ 6.5 Hyperhomocysteinemia—elevated levels of serum homocysteine of more than 20 μ moles/L. Hyperlipidemia—History of dyslipidemia cholesterol, cholesterol $>$ 200 mg/dL, LDL (low-density lipoprotein) $>$ 100 mg/dL, or triglyceride $>$ 150 mg/dL. Smoking history and history of alcoholism were also noted.

The duration of study was November 2023 to December 2024.

Statistical analysis: Various findings of clinical manifestations, distributions of atherosclerotic lesions, and tropical distributions of the recurrence of strokes were classified with percentages. The statistical analysis was performed in SPSS software. The ratio of male and female was 3:1.

RESULTS

[Table 1] Clinical manifestations of stroke patients: 39 (33.6%) alcoholic, 25 (21.5%) homocysteine, 93 (80%) HTN, 63 (54%) DM, 35 (30%) hyperlipidemia, 41 (35.3%) smoking, 56 (48.2%) HTN + DM, 20 (17.2%) HTN + DM + hyperlipidemia, 9 (7.7%): HTN + DM + hyperlipidemia + smoking + alcohol

[Table 2] Study of atherosclerotic lesions (occlusion) in variable arteries: 42 (36.2%) MCA, 17 (14.6%) ICA, 5 (4.3%) ACA, 16 (13.7%) VA, 5 (4.3%) BA, 19 (16.3%) PCA, 3 (2.58%) MCA + ICA, 3 (2.58%) ICA + MCA + ACA, 3 (2.58%) BA + PCA, 2 (1.4%) VA + BA

[Table 3] Study tropical distribution of infarction: 33 (28.4%) cortical, 27 (23.2%) subcortical, 28 (24.1%) cortical and subcortical, 10 (8.6%) brain stem, 13 (11%) cerebellum, 5 (4.3%) others

[Table 4] Study of recurrence in uncontrolled risk factors: (23 patients) 7-Drug compliance to antiplatelets, 3-Drug (anti-platelets), 2-(single anti-plate), 4 statins, 3 HTN controlled, 3 DM controlled, 1 hyperlipidemia controlled.

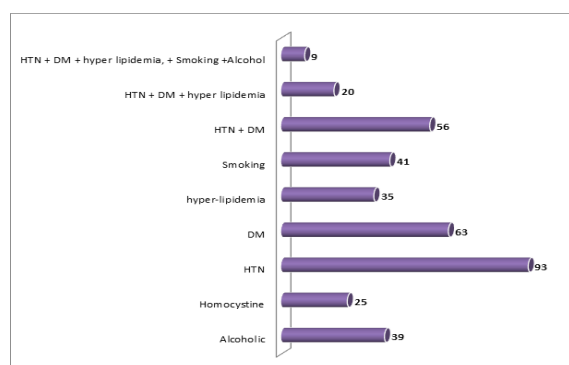


Figure 1: Clinical Manifestations of stroke patients due to atherosclerosis

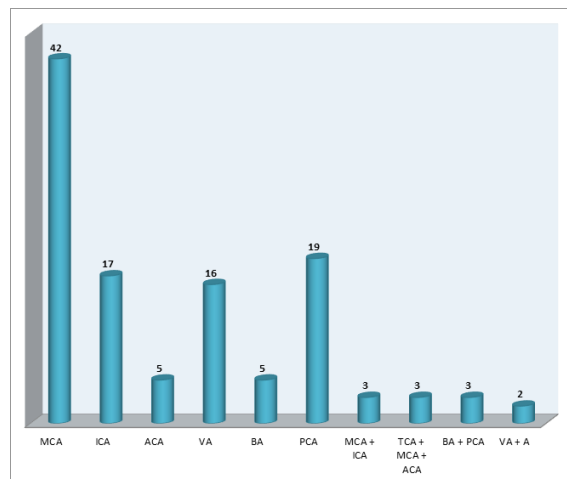


Figure 2: Study of atherosclerotic lesions (occlusion) in various arteries

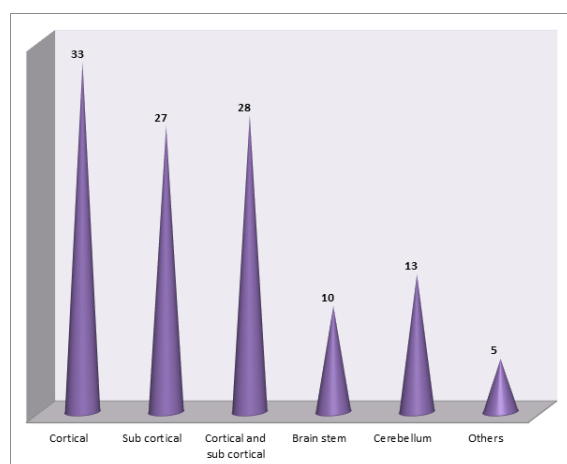


Figure 3: Study of Tropical distribution of Infarction

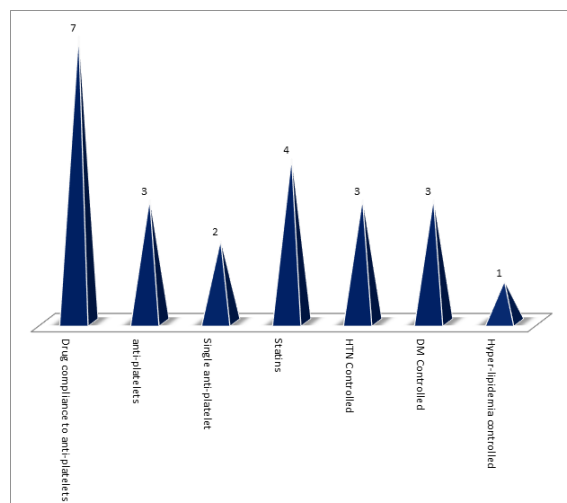


Figure 4: Study of recurrence in un-controlled risk factors

Table 1: Clinical Manifestations of stroke patients due to atherosclerosis.

Sl. No	Clinical Manifestations	No. of patients	Percentage (%)
1	Alcoholic	39	33.6
2	Homocysteine	25	21.5
3	HTN	93	80.1
4	DM	63	54
5	hyper-lipidemia	35	30
6	Smoking	41	35.3
7	HTN + DM	56	48.2
8	HTN + DM + hyper lipidemia	20	17.2
9	HTN + DM + hyper lipidemia, + Smoking +Alcohol	9	7.7

Table 2: Study of atherosclerotic lesions (occlusion) in various arteries

Name of the artery	Frequency	Percentage of lesion (%)
MCA	42	36.2
ICA	17	14.6
ACA	5	4.3
VA	16	13.7
BA	5	4.3
PCA	19	16.3
MCA + ICA	3	2.58
TCA + MCA + ACA	3	2.58
BA + PCA	3	2.58
VA + A	2	1.4

MCA = Middle cerebral artery

ICA = Internal carotid artery,

ACA = Anterior Cerebral artery,

VA = Vertebral artery,

BA = Basilar artery,

PCA = Post cerebral artery

Table 3: Study of Tropical distribution of Infarction

Location	No. of patients (116)	Percentage (%)
Cortical	33	28.4
Sub cortical	27	23.2
Cortical and sub cortical	28	24.1
Brain stem	10	8.6
Cerebellum	13	11
Others	5	4.3

Table 4: Study of recurrence in un-controlled risk factors. (N-23)

Parameters	Patients with recurrence
Drug compliance to anti-platelets	7
anti-platelets	3
Single anti-platelet	2
Statins	4
HTN Controlled	3
DM Controlled	3
Hyper-lipidemia controlled	1

DISCUSSION

In the study of stroke in young patients of Maharashtra. The clinical manifestations included 39 (33.6%) who were alcoholic, 25 (21.5%) with homocysteine, 93 (80.1%) with HTN, 63 (54%) with DM, 35 (30%) with hyperlipidemia, 41 (35.3%) who smoked, 56 (48.2%) with HTN+DM, 26 (17.2%) with HTN+DM+hyperlipidemia, and 9 (7.7%) HTN + Hyperlipidemia + Smoking [Table 1]. In the study of atherosclerosis lesions, the highest occlusion was observed in 42 (36.2%) in the MCA, followed by 19 (16.3%) in the PCA, 17 (14.6%) in the ICA, and the least occlusion was in 2 (1.4%) in the VA + BA [Table 2]. In the tropical distribution, the highest region was 33 (28.4%) cortical, followed by 27 (23.2%) sub-cortical, and both 28 (24.1%) cortical and sub-cortical [Table 3], and the highest recurrence 7 patients due to drug compliance to anti-platelet and

least recurrence was due to hyperlipidemia control [Table 4]. These findings are more or less in agreement with previous studies.^[5-7]

Concurrent atherosclerosis in extra cranial and intracranial arteries was also studied. HTN emerged as the strongest risk factor for concurrent lesion or occlusion, followed by DM, coronary artery, and smoking. Occlusion of large branches of the circle of Willis can lead to stroke by hypoperfusion or by artery-to-artery embolism.^[8] It is also noted that stroke is one of the leading causes of death in India. Stroke was the cause of the death in 13%, which was similar to death due to coronary artery disease, 14%, in Andhra Pradesh.^[9]

Apart from atherosclerosis, gene disorders do lead to stroke in young individuals without known risk factors, and they include CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy), Fabry's disease, and sickle cell disease.^[10] Hence genetic contribution

to stroke is polygenic. It was also observed that apolipoprotein E gene (gene involved with lipid metabolism) was evaluated in stroke patients.

It is accepted globally that tea is the commonest beverage after water. It is shown that a beneficial effect is that tea consumption of 450 ml or more, or more than or equal to three cups per day, was associated with a reduction of the incidence of recurrent ischemic stroke, a significant decrement of systolic blood pressure, better control of fasting hyperglycemia, and a lowering down of the level of total cholesterol and LDL level in the subject with hypercholesterolemia.^[11]

CONCLUSION

The present study of strokes due to atherosclerosis has multiple etiologies like HTN, DM, smoking, and dyslipidemia, as they are not being adequately controlled; hence there is the challenge of a high stroke incidence. Apart from public awareness, it needs more inventional studies to find out the efficacy of preventive agents such as antihypertensives and antiplatelets because the exact pathogenesis of stroke is still unclear.

Limitation of study: Owing to the tertiary location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

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