



# ORIGINAL RESEARCH PAPER

# Neurology

## CLINICAL OUTCOME IN ISCHEMIC STROKES WITH INTERNAL CAROTID OCCLUSION-A STUDY FROM TEACHING HOSPITAL IN KARNATAKA

**KEY WORDS:** Ischemic stroke, internal carotid artery occlusion, arterial stroke.

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### ABSTRACT

**Aim:** To study clinical features and outcome of patients presenting with acute ischemic stroke with internal carotid artery occlusion.

**Material and methods:** Our study was a retrospective observational study. Patients presenting with clinical and imaging features of ischemic stroke with internal carotid artery occlusion to Fr Muller Medical College hospital from January 2017 till March 2019 were included in the study. Clinical features and outcome was recorded at admission and discharge

**Results:** Total of 18 patients were studied. Mean age of the patients was  $63.9 \pm 14.4$  years. Male/Female ratio of 2:1, vascular risk factors were present in 50% of patients and past history of stroke in 38% patients. Significant motor weakness was observed in 77% patients and at the time of discharge poor outcome was seen 67% patients.

### INTRODUCTION

Cerebrovascular accidents are the most common neurological diseases to affect man and are leading causes for morbidity in the world. Cerebrovascular accidents are classified into ischemic and hemorrhagic strokes. Ischemic strokes are further subclassified into lacunar strokes, large vessel occlusions, cardio embolic strokes, Strokes of other determined cause and strokes of undetermined cause as per TOAST criterion.<sup>1</sup> The incidence of these subtypes differ between Indian and Western population. Indian population is found to have more large vessel occlusions whereas western population has more cardio embolic strokes.<sup>2</sup> Our study aimed to identify clinical course and outcome in patients with ischemic stroke with complete carotid occlusions.

### MATERIALS AND METHODS:

Our study is a retrospective observational study conducted in department of Neurology in Father Muller medical college, Mangalore. Patients with acute ischemic stroke with Magnetic resonance angiography or carotid Doppler study showing complete occlusion of internal carotid arteries admitted from January 2017 till March 2019 were included into the study. Case files were reviewed and demographic details, clinical features and outcome at discharge was noted. Modified Rankin scale (mRs) scores were used at admission and discharge to assess the clinical outcome. A mRs score of 0-2 was considered as good outcome and mRs score of greater than 2 was considered as poor outcome.

### RESULTS

A total of 18 patients were admitted with acute ischemic stroke and internal carotid artery (ICA) occlusion during the study period. Out of 18 patients, 12 (67%) were male and 6 (33%) were female. Mean age at admission was  $63.9 \pm 14.4$  years. Among the patients, diabetes mellitus was seen in 9 (50%), hypertension in 9 (50%), past history of stroke in 7 (38.1%) and ischemic heart disease in 3 (16.7%) patients. Hemiparesis was seen in 11 (61.1%), quadriparesis in 3 (16.7%) and monoparesis in 1 (5.6%) patients. Three (16.7%) patients presented with only visual disturbances. Mean Glasgow score at admission was  $10.5 \pm 4.3$ . Unilateral ICA occlusion was seen in 15 (83.3%) whereas 3 (16.7%) had bilateral ICA occlusions. All patients received antiplatelet therapy whereas 9 (50%) received anti coagulation. Mean mRs at admission was  $4.2 \pm 1.0$  and at discharge was  $3.2 \pm 1.8$ . Good outcome was seen in 6 (33%) patients and poor outcome was seen in 12 (67%) patients.

### DISCUSSION

Cerebral circulation can be broadly classified into anterior

and posterior circulation. Anterior circulation is maintained by internal carotid artery and its branches. Internal carotid artery is a large artery formed by division of common carotid artery at the level of upper border thyroid cartilage in neck. It has an extra cranial and intracranial course with well described segments and terminates by branching into anterior and middle cerebral arteries.<sup>3</sup> There is communication between external and internal carotid arteries through angular arteries and internal maxillary artery which form collaterals and sustain cerebral circulation in case of long standing internal carotid artery occlusions. Hence strokes due to internal carotid artery occlusions can have a variable course and outcome.<sup>4-5</sup> In many occasions internal carotid occlusions can be asymptomatic initially and early intervention during this stage has been the focus of many pivotal trials.<sup>6-7</sup>

Our study was focused on ischemic strokes with complete ICA occlusion and clinical outcome. Mean age of our patients was comparable with western studies.<sup>8-9</sup> In our study males were more likely to have ICA occlusion than females. This is likely due to presence of vascular risk factors and habits such as smoking and alcohol abuse being more prevalent in men.<sup>8</sup> Most of the ICA occlusions occurred after the age of 50 and Co existing diabetes and hypertension was present in more than half of patients. This suggests large vessel occlusions commonly occur in elderly with multiple vascular risk factors. A significant portion of patients had previous cerebrovascular accidents suggesting intervention such as carotid stenting or endarterectomy at 1<sup>st</sup> event probably would have prevented the recurrence. A study stated that risk of recurrence of stroke for symptomatic carotid occlusion was 5.9% per year.<sup>9</sup>

In our study More than 77% patients had significant neurological deficits of either hemiparesis or quadriparesis suggesting the severe nature of large vessel ischemia. Outcome measures showed that most of the patients had significant residual disability at the time of discharge and only one third of patients had a good outcome.

### CONCLUSION

Ischemic stroke with Internal carotid artery occlusion is a disease predominantly affecting the elderly and male population and has higher chance of poor outcome. Presence of multiple vascular risk factors was observed in the study population. A significant number of patients had previous history of strokes and would have benefited from therapeutic intervention at 1<sup>st</sup> episode of stroke. Identifying the major vessel occlusion and appropriate management may help in preventing major strokes in this group of patients.

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