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## Original Research

### Assessment Of Characteristics Among Patients Of Cerebrovascular Accidents And Complications Of Carotid Angiographic Technique

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#### ABSTRACT

**Introduction:** Evaluation of the hemodynamic status of the brain may identify an increased risk of stroke in patients with occlusion or high-grade stenosis of the intra or extracranial arteries. In developing countries, imaging facilities are not available in most of the small districts and towns, where early diagnosis of ischemic stroke can lead to early patient referral to centers with fibrinolytic therapy facilities and decrease in stroke injuries. Hence, present study aims to assess clinical characteristics among patients of cerebrovascular accidents and complications of carotid angiographic technique. **Material and Methods:** In the present study 35 patients above twenty years of age were taken up. These patients had presented with neurological manifestations of sudden or gradual onset. All of them were subjected to percutaneous carotid angiography. These patients were evaluated on the clinical proformas attached to this study. **Results:** 34.5 % cases were in seventh decade and 8.5% in fourth decade of life. 57.1 % patients presented with a sudden onset of neurological manifestations, within 24 hours the stroke was completed. While rest of the patients had neurological manifestations of gradual onset. 50.1 % patients gave history of loss of consciousness at the onset of neurological manifestations. The major neurological deficit was hemiplegia happened to be in 85.71% cases. Hemiplegia with cortical sensory loss was found in 10.4 % cases . While 8.5 % patients developed hemiplegia with diminishment of vision. Expressive aphasia was observed in 28% patients. **Conclusion:** In the present study, maximum cases were in seventh decade and minimum in fourth decade of life. Hemiplegia happened to be the major neurological deficit in the present study. There were no major complications following carotid angiography, it is observed that this technique is non hazardous.

**Keywords:** Angiography; Cerebrovascular accident; Hemiplegia; Stroke

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#### INTRODUCTION

Cerebrovascular accident (CVA) includes any vascular injury that diminishes brain and its derivatives blood flow, and causes various degrees of neurologic dysfunction and disability.<sup>1,2</sup> Evaluation of the hemodynamic status of the brain may identify an increased risk of stroke in patients with occlusion or high-grade stenosis of the intra or extracranial arteries. Such stenoses or occlusions, as well as those of alternative collateral pathways, can be readily detected with cerebral angiography.<sup>3</sup> Rapid advance in medical technology has resulted in the availability of numerous tests and treatment strategies in the management of acute stroke. The increasingly evidence-based context of clinical medicine necessitates that clinicians use only appropriate tools to facilitate the diagnostic process and patient management.<sup>4</sup> On the other hand, in developing countries, imaging

facilities are not available in most of the small districts and towns, where early diagnosis of ischemic stroke can lead to early patient referral to centers with fibrinolytic therapy facilities and decrease in stroke injuries.<sup>5</sup> Hence, present study aims to assess clinical characteristics among patients of cerebrovascular accidents and complications of carotid angiographic technique.

#### MATERIAL AND METHODS

In the present study 35 patients above twenty years of age were taken up. There were twenty four males and eleven females. Mean age of the patients was 49.4 years. These patients had presented with neurological manifestations of sudden or gradual onset. All of them were subjected to percutaneous carotid angiography. The help of other investigations was also taken. These patients were

evaluated on the clinical proformas attached to this study. Cerebral angiography is the demonstration of cerebral vessels in X-ray films by injecting a contrast media in the common carotid artery. After the need for carotid angiography has been established clinically, the patient should be asked to submit a written consent. The sensitivity to the contrast media should be done by administering one drop of the dye in the patient's conjunctival sac of one eye. Both eyes are examined after a period of 30-45 minutes for evidence of redness. It is important not to read the eye in less than 30 minutes. If the eye does not become red, then the test is negative. If it becomes red, the test is positive and the dye is contraindicated. This is very rare. If the procedure is to be done under local anaesthesia, the patient's confidence is essential. It is wise to tell him what will happen during the procedure of injection e.g. pain at the site of injection, heaviness in the head and supraorbital region. He should also be told to keep himself to the sounds like "ready", "shoot, etc. At least twelve X-ray films of 10" x 12" duly arranged and numbered are required. The patient is placed in supine position. The head is extended and placed over a very thin pad of foam. An inflator rubber bag is placed under the patients shoulder, this bag can be elevated at will and the desired extension of the neck can be obtained. Excessive extension of the neck should be avoided as it may lead to poor feeling of the carotid pulsations. The knees are put in a flexed position and a strap is tied over them. Both the hands are also tied by straps. This prevents unnecessary movements of the body. For the insertion of the needle, the skin is first prepared by local antiseptics. Taking all antiseptic precautions, the local anaesthesia (Procaine, Xylocaine) is infiltrated in the intradermal area and later on in the deeper

structures making sure that none goes in the blood stream. The artery is palpated and the area is massaged to keep the spread the local anaesthesia. The artery is then palpated and fixed with the second and third fingers of the left hand. With one finger the sternomastoid is displaced laterally. The Jugular vein should also be displaced laterally so that the anterior part of the artery is uncovered. A small incision is then given to the area where the pulsations are felt best. The incision should not be deep and should not damage the artery. The needle is then inserted gradually. While inserting the needle, one must not forget that the artery is surrounded by many important structures like superior margin of the thyroid cartilage. At this level, the bifurcation of the common carotid artery usually takes place. Therefore, to inject the common carotid artery the puncture should be made as low as possible. By doing this any obstruction at the level of internal carotid artery can be made out. The region of the bifurcation of the internal carotid artery is, the most common site for atheromatous plaques. In our series of patients the contrast media used is conray 280. When the procedure is completed, firm pressure should be applied for 10-15 minutes. The patient should be watched for any complication for next 2-4 hours.

**RESULTS**

Thirty five cases between age groups of twenty years and seventy years have been included. All of them were subjected to percutaneous carotid angiography. Maximum cases were in seventh decade (34.5 % ) and minimum in fourth decade of life (8.5%).

57.1 % patients

**Table 1: Clinical findings among patients of cerebrovascular accidents who underwent carotid angiography**

Clinical parameters		n=35	Percentage	
<b>Gender</b>	Males	24	68.50%	
	Females	11	31.50%	
<b>Mode of onset of neurological manifestations</b>	Sudden	20	57.1%	
	Gradual	15	42.9%	
<b>Incidence of unconsciousness &amp; hemiplegia at onset of neurological manifestations</b>	Unconsciousness	18	51.40%	
	Hemiplegia	30	85.71%	
<b>Incidence of patients complaints</b>	Unconsciousness (n=18)	Sudden	10	28.6%
		Gradual	8	22.8%
	Hemiplegia (n=30)	Sudden	17	48.37%
		Gradual	13	37.14%
	Headache	5	14.23%	
	Vomitings	5	14.23%	
	Syncope	4	11.5%	
	Convulsions	3	8.57%	
	Visual disturbances	3	8.57%	
	Aphasia	10	28%	
	Involuntary movements	2	5.71%	
	Recurrent attacks of weakness	3	8.57%	
<b>Incidence of hypertension in patients</b>		11	31.42%	
<b>Incidence of diabetes in patients</b>		4	11.4%	

**Table 2: Complications of carotid angiography in present study**

Complications		Number	Percentage	
Minor	Cervical hematoma	Small	7	20%
		Large	2	5.71%
		Temporary visual disturbances	Nil	Nil
	Hemodynamic changes	1	2.85%	
	Convulsions	Nil	Nil	
Major	Hemiplegia	Nil	Nil	
	Death	Nil	Nil	

presented with a sudden onset of neurological manifestations, within 24 hours the stroke was completed. While rest of the patients had neurological manifestations of gradual onset. 50.1 % patients gave history of loss of consciousness at the onset of neurological manifestations. All patients had regained full consciousness at the time of angiography. Hemiplegia happened to be the major neurological deficit in the present study (85.71%). Hemiplegia with cortical sensory loss was found in 10.4 % cases . While 8.5 % patients developed hemiplegia with diminishment of vision. Expressive aphasia was observed in 28% patients (table 1). There were no major complications following carotid angiography (table 2), it is observed that this technique is non hazardous.

**DISCUSSION**

A large number of risk factors contribute to cerebrovascular accidents risk, including age, blood pressure, smoking and diabetes. The neurological consequences depend on the region of the brain affected. Localization is usually possible using a knowledge of cerebral arterial anatomy and localization of different functions with the brain.<sup>6</sup> In the present study, maximum cases were in seventh decade (34.5 % ) and minimum in fourth decade of life (8.5%). 57.1 % patients presented with a sudden onset of neurological manifestations, within 24 hours the stroke was completed. While rest of the patients had neurological manifestations of gradual onset. 50.1 % patients gave history of loss of consciousness at the onset of neurological manifestations. All patients had regained full consciousness at the time of angiography. Hemiplegia happened to be the major neurological deficit in the present study (85.71%). Hemiplegia with cortical sensory loss was found in 10.4 % cases . While 8.5 % patients developed hemiplegia with diminishment of vision. Expressive aphasia was observed in 28% patients. There were no major complications following carotid angiography. In a study carried out by Altemus LR et al,<sup>7</sup> 14 examples of arteriographically visualized divisional occlusion were analyzed, and a good correlation is demonstrated between the roentgenologic and clinical findings. Ojaghihaghghi S et al<sup>5</sup> carried a study to investigate parameters for predicting long-term outcome in patients with hemorrhagic and ischemic stroke and to test a system that might practicably be used routinely to aid management and

predict outcomes of individual stroke patients. A descriptive hospital-based study of the neurological symptoms and signs of 503 patients with ischemic stroke, including severe headache, seizure, eye movement disorder, pupil size, Glasgow Coma Scale (GCS), agitation were analyzed in this study and dilated pupils, agitation, acute onset headache, lower GCS score, seizure, and eye gaze impairment had significantly higher prevalence in hemorrhagic stroke patients (P<0.001). However, the rate of gradual progressive headache is significantly higher in ischemic stroke patients (P<0.001). Although this result provides reliable indicators for discrimination of stroke types, imaging studies are still the gold standard modality for diagnosis. Heiserman JE et al<sup>8</sup> examined the incidence of neurologic complications associated with modern cerebral angiography and assessed patient characteristics associated with an increased risk of complications. One thousand consecutive cerebral angiographic procedures were evaluated prospectively. Patients were evaluated during and at the completion of angiography. There were a total of 10 neurologic complications within 24 hours of angiography, 5 of which were persistent. Onset of 5 of the deficits occurred during angiography, the other 5 (3 persistent) were delayed. All complications occurred in patients being evaluated for stroke/transient ischemic attack or (in one case) asymptomatic bruit. Cerebral angiography was associated with a 1% overall incidence of neurologic deficit and a 0.5% incidence of persistent deficit. All complications occurred in patients presenting with a history of stroke/transient ischemic accident or carotid bruit, which may reflect the difficulty of performing angiography in this population at risk for atherosclerotic changes. Earnest F et al<sup>9</sup> studied complications of cerebral angiography and reported the incidence of all complications was 8.5%, and the incidence of all neurologic complications was 2.6%. The overall incidence of permanent neurologic deficit was 0.33%. The incidence of permanent neurologic deficit in patients referred for evaluation of symptomatic cerebrovascular disease was 0.63%. Older age, increased serum creatinine concentration, and the use of more than one catheter all were significantly associated with serious neurologic complications. Immediate diagnosis and treatment may dramatically diminish the rate of neurological impairment in patients after CVA, and differentiating the type of stroke plays a crucial role in patient management and treatment.<sup>10</sup> Early

diagnosis is important in stroke patients to prevent permanent defects. Although, the need for diagnostic imaging in distinguishing stroke types is an undeniable fact, in units without imaging facilities, clinical findings can be helpful in distinguishing types of stroke.<sup>11</sup>

## CONCLUSION

In the present study, maximum cases were in seventh decade and minimum in fourth decade of life. 57.1 % patients presented with a sudden onset of neurological manifestations, within 24 hours the stroke was completed. Hemiplegia happened to be the major neurological deficit in the present study. Expressive aphasia was observed in 28% patients. There were no major complications following carotid angiography, it is observed that this technique is non hazardous.

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