

# Vertigo: A Precursor Of Stroke: Role Of An Otolaryngologist.

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**ABSTRACT:** Vertigo is usually of benign nature but can be a precursor of a very fatal outcome. Many patients with multiple vascular risk factors and seemingly benign isolated episodes of vertigo have occasionally been seen to develop an ischaemic event (stroke) by various researchers. As the bulk of vertigo patients (nearly 80%) are treated by otolaryngologists, some of these patients with constitutive risk factors could be at actual risk of stroke, so early identification of such patients becomes necessary. This is a retrospective study of 92 stroke patients admitted in SHMS hospital, Srinagar (2009 - 2011) who were reviewed and enquired for any history of true vertigo episodes prior to or at onset of stroke. Study included 64 male patients and 28 female patients with about 65% of the patients falling in the age group of 51-70 years. History of transient ischaemic attacks were reported in 9 patients while vertigo (single and multiple episodes) was seen in 24 patients prior to stroke in this study. Vertigo should be regarded a precursor of stroke in patients with multiple vascular risk factors and they should be evaluated for vertebralbasilar insufficiency by MRI/MRA at an earliest so that preventive measures can be adopted in time.

## INTRODUCTION:

Vertigo is the illusion of movement of the body or the environment<sup>1</sup>. Although commonly classified into peripheral and central vertigo, there are diseases with possible central and peripheral involvement (infectious, auto immune, vascular and metabolic diseases etc.) where the lesion's topography is not easy to determine<sup>2</sup>. Although vertigo is usually benign<sup>3</sup> resulting from inner disorders, a team from Chicago has concluded that vertigo is the most common symptom of vertebralbasilar insufficiency<sup>4</sup>. Episodes of vertigo frequently occur in these patients. The onset of vertigo is abrupt and lasts a few minutes. It may occur in isolation or with other symptoms of vertebralbasilar insufficiency<sup>5</sup>. When other signs and symptoms are present, the diagnosis is obvious where as when vertigo occurs in isolation it is difficult to differentiate from other more benign disorders involving inner ear. There is a transient decrease in cerebral blood flow which remains an important factor in episodic vertiginous syndrome whether neuronal defects are occurring or not. Neuronal degeneration is an irreversible process so improvement suggests a vascular cause<sup>6,7</sup>.

The advent of MRI and MRA have clarified location and vascular basis for vertigo and used in combination, they establish the location and the pathology of the lesion indicating vascular, inflammatory or neoplastic sources of the symptoms<sup>8,9</sup>. John J Welsh et al (2000) studied the relationship of isolated vertigo episodes to vascular disease of the vertebralbasilar arterial system by MRI and angiography in 89 individuals complaining of vertigo of suspected vascular origin. Approximately 52% of the cohort demonstrated abnormal configuration or evidence of diminished flow within the vertebralbasilar arterial system<sup>10</sup>. The role of otolaryngologist lies in early recognition of such patients who may actually be at increased risk of stroke so that preventive measures can be instituted at an early stage in the course of disease and possible disability and suffering reduced.

**Aims & objectives:** The main aim of the present study is to emphasize upon otolaryngologists that vertigo should be regarded a precursor of stroke in patients with positive risk factors for vascular disease and to advocate use of MRI/MRA of vertebralbasilar arterial system in such patients so that appropriate measures can be adopted in time.

**Material and methods** : This is a retrospective study carried out on stroke patients admitted in SMHS hospital, Srinagar, J & K. The hospital is associated to government medical college Srinagar and is the main referral institution of peripheral hospitals of Kashmir valley. The sample comprises of 92 stroke patients admitted in this hospital (2009-2011). Clinical data from the patients included detailed history and examination (including neurological and vestibular examination) and routine investigations and radiological evaluation (including CT, MRI, MRA, transcranial Doppler). The patients were enquired about various risk factors for stroke and any history of vertigo in past or at the onset of stroke.

## **INCLUSION AND EXCLUSION CRITERIA:**

Only patients with true vertigo with a sense of rotation of self or the surroundings have been recorded as having had vertigo and patients with dizziness or syncopal attacks have not been recorded as having had vertigo episodes

**Observation and results:** Majority of patients were males. Male: female ratio was 2.28. (70%) (Table 1) Majority

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of patients were seen in 51-70 years of age group. Mean age of patients in present study is 64 years (Table-2) Prevalence of vertigo episodes is significantly higher than transient ischaemic attacks which signify the importance of vertigo as a precursor of stroke. (Table 3) 40% of patients had vertigo prior to or at onset of stroke and 26% had vertigo prior to onset of stroke (Table-4)

Figure 1 and 2 shows pictures of MRA and MRI of one of the patient

#### **Discussion:**

Vertebrobasilar ischaemia presents with variable features of cerebellar, pontine, medullary, mesencephalic, and occipital lobe dysfunction<sup>11</sup>. The common presentation with vertigo may be due to the fact that vascular supply to the vestibulocochlear organ being an end artery may be more susceptible to vertebrobasilar insufficiency<sup>12</sup>. Acute ischaemic stroke in the distribution of AICA (Anterior inferior cerebellar artery) is known to be associated with vertigo<sup>13, 14, 15, 16</sup>. Adams (1943) was the first to completely describe the syndromes associated to AICA occlusion. He alluded to the difficulty of assigning the time of onset to the symptoms of vertigo and hearing loss in the patients of stroke, suggesting that the issue of transient ischaemic attacks consisting of vertigo could have been frequently overlooked. Grad and Baloh (1989) reviewed 84 patients with vertigo of presumed cerebrovascular origin. There was an increasingly high incidence of isolated episodes of vertigo lasting minutes and in some patients these episodes preceded other symptoms of vertebrobasilar insufficiency or infarction by months. In this study, 92 patients were studied out of which 37 patients had experienced vertigo episodes prior to or at onset of stroke. 24 patients had experienced vertigo episodes more than 3 days prior to final event out of which 15 patients had experienced multiple episodes of vertigo. Vascular risk factors like hypertension was present in 83 patients, 43 patients were chronic smokers, 24 patients had cardiac disease and 14 patients had diabetes mellitus in this study. About 80% of patients were more than 50 yrs of age. According to Oleszewski et al (2006) strong vascular risk factors are age, hypertension, cigarette smoking, diabetes mellitus and hyperlipidemia. Hyung Lee et al (2002) prospectively identified 12 consecutive patients of stroke out of which 4 patients had vertigo with or without auditory manifestations from day 1 to 2 months before infarction. Amarenco et al (1993) documented 9 patients of AICA infarcts out of which prodromata in the form of vertigo were present in 5 patients. The results of our study are comparable to above studies. Seeing the magnitude of association between the occurrence of episodes of vertigo prior to or at the onset of stroke, it cannot be expected merely out of chance but because of a common etiology, vertigo being an earlier event in the pathogenesis of stroke in presence of other risk factors. Had the same been considered in 24 (26%) patients of this study (with history of vertigo prior to stroke) with vascular risk factors being present in almost all, this major tragedy could have been averted in some (if not all) by timely administration of drugs and risk factor modification after screening by imaging studies like MRI, MRA and transcranial Doppler.

#### **CONCLUSION:**

Vertigo is usually of benign nature but patients of vertigo with vascular risk factors should be evaluated for vertebrobasilar insufficiency by MRI, MRA, carotid Doppler (transcranial) and risk factors for vascular disease modified by drugs (hypolipidemic, antihypertensives, aspirin); behavioral changes (regular exercise, stop smoking) and dietary modification. These patients may be at risk of a future stroke and by timely intervention and wise referral fatal outcome and disability can be reduced in a significant number of patients.

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**Table 1: Sex distribution of patients in present study (n=92)**

Males	Females
64(70%)	28(30%)

**Table 2: Age distribution of patients in present study (n=92)**

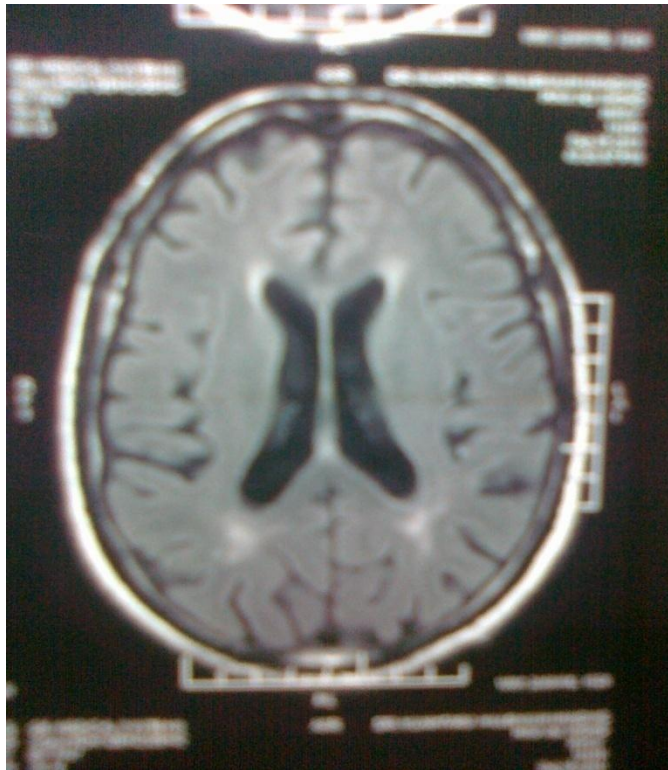
Age group	No. of patients
31-50 yrs	11(12%)
51-70 yrs	59(64%)
71-90 yrs	22(24%)

**Table 3: Prevalence of transient ischaemic attacks and vertigo in patients in present study (n=92)**

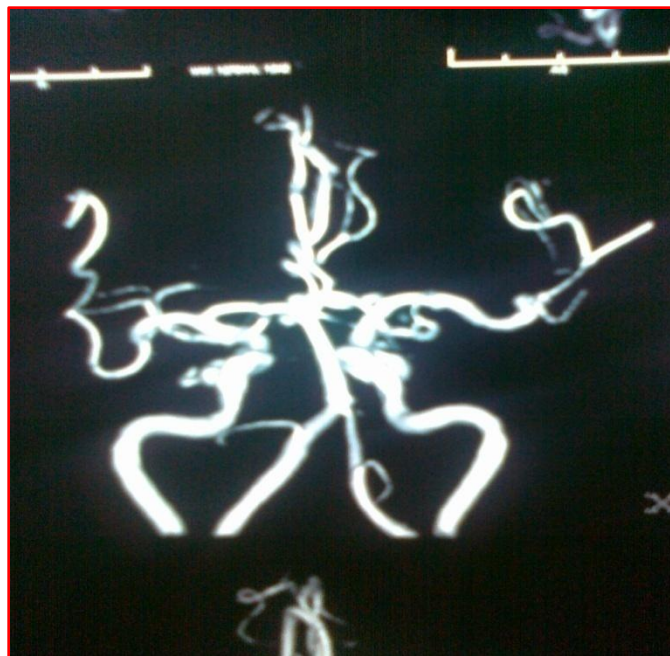
Symptoms	No. of patients
Transient ischaemic attacks	9(10%)
Vertigo episodes prior to stroke	24(26%)

**Table 4: Vertigo prevalence in relation to stroke in present study (n=92)**

	No. of patients
Vertigo prior to or at onset of stroke	37(40%)
Vertigo prior to onset of stroke	24(26%)
Multiple vertigo episodes prior to onset of stroke	15(16%)
Single vertigo episode prior to onset of stroke	9(10%)



**Figure-1:** Patient of vertigo with Ischemic changes in brain on MRI



**Figure- 2:** MRA of same patient showing intracranial small vessel disease