

Original Research Article

Unmasking the culprits of ocular motor nerve palsies

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ABSTRACT

Background: The objective of the study was to describe the clinical, demographic, and etiological profile of patients with symptoms of acquired ocular motor palsy presenting to tertiary care centre at Gadag.

Methods: 25 consecutive patients with symptoms of ocular motor nerve palsies visiting ophthalmology outpatient department (OPD) were investigated. All underwent complete ophthalmological examination. Imaging studies of the brain and laboratory tests were performed for all the patients.

Results: Out of 25 patients, sixth cranial nerve palsy was seen in 16 patients. Rest of the 9 patients had pupil sparing 3rd nerve palsy, of which 2 had partial ptosis. Overall, an etiological diagnosis was made in 22 cases. 21 patients had vascular cause. One patient aged 24 years had cavernous sinus haemangioma. Computed tomography (CT) scan failed to reveal any abnormality in 3 cases.

Conclusion: Ocular motor nerve palsy may be obvious or sub-clinical. Multisystemic approach is needed in these patients. Careful clinical examination and prompt investigations aids in early diagnosis and management.

Keywords: Nerve palsies, Vascular, Ischaemia

INTRODUCTION

An isolated ocular motor nerve palsy is defined as dysfunction of a single ocular motor nerve (oculomotor, trochlear, or abducens) with no associated or localizing neurologic signs or symptoms. Microvascular ischemia is the most common cause in patients ages 50 years or older.¹

Isolated cranial nerve (CN) palsies are frequently encountered by strabismologists. Management of these patients include a detailed examination including age, time of onset, duration of symptoms, comorbidities and past medical history. In older patients with microvascular risk factors, immediate neuroimaging has to be done after close analysis by the physician. But patients presenting with multiple cranioneuropathies need immediate workup.²

In a series of patients with acute isolated ocular motor nerve palsies, a substantial proportion of patients had other causes, including neoplasm, GCA, and brain stem

infarction. Brain magnetic resonance imaging (MRI) and laboratory workup have a role in the initial evaluation of older patients with isolated acute ocular motor nerve palsies regardless of whether vascular risk factors are present.³

Patients with acquired isolated ocular motor nerve palsies should be considered for early neuroimaging studies when they are younger than 50 years old, those who have a history of head trauma, have no history of vascular risk factors, or have poor pupillary reaction.⁴

The natural history and prognosis of oculomotor nerve palsy varies depending on the cause. The vascular causes have the better recovery rate and shorter recovery time, whereas the neoplastic causes require longer time to recover.⁵

Inflammation and space-occupying lesions were the most frequent causes of OMNP especially in CNP III. The

presence of additional CNPs increases the probability of an inflammatory or space-occupying cause.⁶

METHODS

Study type

This is a prospective observational study.

Study place

The study was carried out in the Department of Ophthalmology, Gadag Institute of Medical Sciences.

Study duration

The duration of the study was from June 2024 to December 2024.

Inclusion criteria

All patients presenting with symptoms of acute onset double vision and/or deviation of eye were included in the study.

Exclusion criteria

All patients with pre-existing squint were excluded from the study.

Procedure

A total of 25 patients presented with symptoms of ocular motor nerve palsies to ophthalmology OPD.

All patients underwent complete ophthalmological examination which included, distant vision and near vision testing using Snellens chart. Patients were asked to read letters of progressively smaller sizes from a distance of 6 meters. Near vision chart was held at a reading distance, ensuring that fine vision was intact. Pupillary light reaction was examined using a torchlight to assess direct and consensual pupillary responses. Anterior segment examination was done with the help of slit lamp biomicroscopy. Posterior segment examination was done with the help of indirect ophthalmoscopy using a 20D lens. Diplopia charting was done with help of red green goggles where in, the patient wore red-green goggles while looking at a light source to differentiate the images seen by each eye, helping to determine the type and pattern of diplopia. Ptosis evaluation was done wherever applicable. Specific measurements were taken, including palpebral fissure height, margin reflex distance (MRD-1 and MRD-2), and levator function test.

All patients underwent a routine baseline blood investigations including complete blood count (CBC), random blood sugar (RBS), blood pressure (BP) and glycated haemoglobin (HbA1c). Cross consultation with the department of otorhinolaryngology to rule out sinus-

related or nasopharyngeal pathologies that could impact the cranial nerves was taken. Consultation with the general medicine department ensured systemic conditions such as diabetes, hypertension, or infections were appropriately evaluated. Neurology consultation was sought to assess for possible central nervous system (CNS) pathologies, including stroke, multiple sclerosis, myasthenia gravis, or brainstem lesions. All patients underwent neuroimaging (MRI/CT). This comprehensive evaluation ensured a systematic approach to diagnosing and managing ocular motor nerve palsies, enabling appropriate intervention based on the underlying cause.

Statistical analysis

Data was entered in excel sheet. Data analysis was done using statistical package for the social sciences (SPSS) software. Results were calculated using percentages and frequencies.

RESULTS

The gender distribution graph showed that out of 25 patients, 60.0% male (15 patients) and 40.0% female (10 patients) were affected (Figure 1).

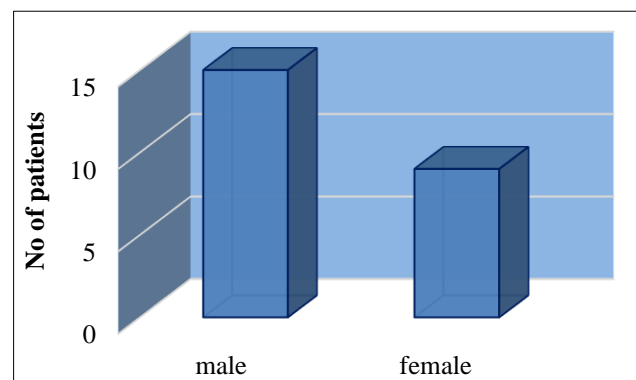


Figure 1: Gender distribution.

56% patients (n=14) found to have diabetes as risk factor, 28% (n=7) patients had hypertension and the remaining 16% (n=4) had both diabetes and hypertension (Figure 2).

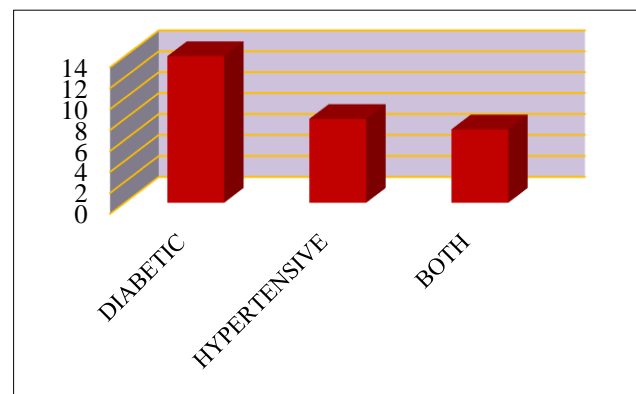


Figure 2: Risk factors.

Symptoms as reported by the patients at the time of presentation were as follows; deviation of eye (25 patients=100%), diplopia (25 patients=100%) visual impairment (13 patients=52%), ptosis (2 patients=0.8%). (Figure 3).

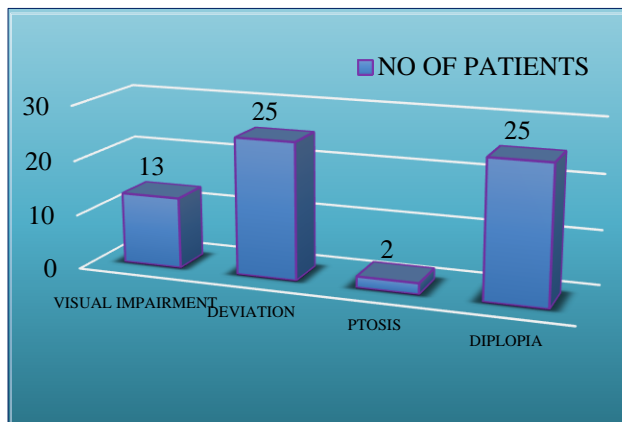


Figure 3: Patient presentation.

Sixth cranial nerve palsy was seen in 64% of patients (16 patients). Rest of the 36% of patients (9 patients) had pupil sparing 3rd nerve palsy, of which 2 patients had partial ptosis (Figure 4).

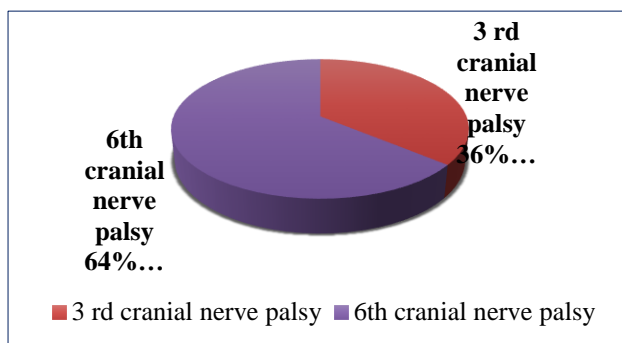


Figure 4: Type of nerve palsy.

An etiological diagnosis was made in 88.0% of cases (22 cases). 21 patients had vascular cause. 1 patient aged 24 years had cavernous sinus hemangioma. CT scan failed to reveal any abnormality in 3 case (12%) (Figure 5).

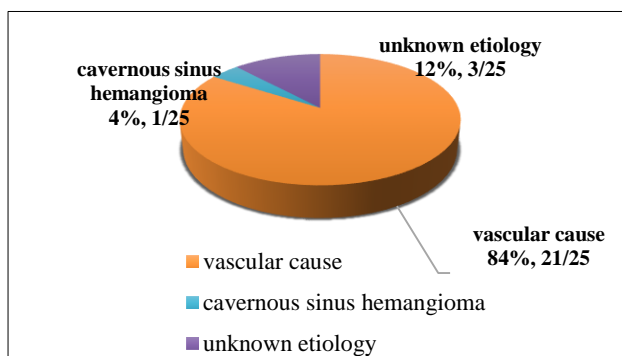


Figure 5: Neuroimaging findings.

DISCUSSION

According to Phuljele et al, ischemia is the most common etiology raising concerns causing ocular motor nerve palsies. Sixth nerve was most commonly involved in all age groups.⁷ Thamankar et al showed that although microvascular causes were the predominant cause for OMNPs, other causes like neoplasm, GCA, and brain stem infarction should be ruled out.⁸

Galtrey et al showed that risk factors for microvascular nerve palsies were age (93% occur in people over 50 years), hypertension (25%), diabetes (18%), or both hypertension and diabetes (7%).⁹

The patients with CN 3/4/6 palsies exhibited an increased risk of developing ischemic stroke. Therefore, isolated ocular motor nerves palsies appear to represent an unrecognized risk factor for ischemic stroke, and these require further confirmation and exploration.¹⁰ Clinical manifestations of ocular motor palsies may differ according to the type and the localization of the lesions involving the third, fourth, and sixth cranial nerves. Magnetic resonance imaging (MRI) has been confirmed to be the most important diagnostic tool in most cases.¹¹

A substantial proportion of young adult patients with ocular motor nerve palsies manifested pathologies other than presumed microvascular ischemia or idiopathic causes. Neuroimaging and laboratory tests have important roles in the evaluation of patients aged 20-50 years with acquired ocular motor nerve palsies.¹²

Limitations

Sample size and duration of study are not sufficient and may or may not be applicable to the population. Our study being an observational study, needed multisystemic approach. However, more number of cases with longer study duration will be required to study the long term consequences of the disease.

CONCLUSION

Ocular motor nerve palsy may be obvious or sub-clinical. Multisystemic approach is needed in these patients. Careful clinical examination and prompt investigations aids in early diagnosis and management. In this study, sixth nerve palsy was most common. While hypertension and diabetes were the leading cause in patients above 50 years, intracranial tumor was present in a young patient.

This makes imaging modalities play an important role in early diagnosis of such cases. Community screening campaigns for diabetes mellitus and hypertension is crucial in identifying undiagnosed diabetic and hypertensive individuals and hence delaying microvascular and macrovascular complications to a major extent.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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