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Ophthalmology

AN OBSERVATIONAL STUDY ON CLINICAL PROFILE AND RECOVERY OF ACQUIRED BINOCULAR DIPLOPIA

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ABSTRACT

BACKGROUND: There has been varied etiologies attributed to extraocular muscle palsies. The purpose of this study is to find the clinical pattern of involvement of EOM palsy , etiopathogenesis and its recovery.

METHODS: All cases with acquired binocular diplopia attending ophthalmology OPD at STANLEY MEDICAL COLLEGE were included in our study. .

RESULTS: A total of 82 patients were included In the study. we conclude that ,cranial nerve palsy is the most common cause of diplopia. Among them sixth cranial nerve palsy is common which accounts for 67.21%. It is unilateral in 88.80% and bilateral in 11.20%. we have found that diplopia due to comorbidities had good recovery. Thorough clinical examination and investigations should be done to manage treatable causes of diplopia.

CONCLUSION: Our analysis suggests that successful management of treatable underlying disease is the important factor for recovery of diplopia.

KEYWORDS : diplopia, binocular, cranial nerve palsy.

INTRODUCTION:

Patients experiencing binocular diplopia can have any etiology starting from central nervous system to extraocular muscles. Among them patients with acute onset of diplopia has to be attended immediately and the management should be appropriate. The most common etiology has been studied along with the most common muscle involved. This study has been carried out in a tertiary health care hospital in Tamilnadu. An anatomic and systematic approach to the clinical evaluvation of diplopia can lead to accurate diagnosis without extensive laboratory investigation.

MATERIALS AND METHODS:

All the patients attending ophthalmology OPD in Stanley medical college along with patients referred from other department from june 2017-2018 were included in the study.

INCLUSION CRITERIA:

patients with acquired binocular diplopia were included in the study.

EXCLUSION CRITERIA:

Congenital defects ,monocular diplopia were excluded from the study. Our patient's age, sex ,past medical history such as diabetes ,hypertension, ischemic heart disease ,vascular diseases were noted.

Thorough ocular examination which included diplopia charting, force duction test, prism bar test, hess charting, Maddox wing test, worth 4 dot test were done. Systemic examination which included central nervous system to rule out central causes, cardiovascular changes to rule out vascular causes, abdomen examination was done to rule out metastatic causes ,neck examination to rule out thyroid disorder and regional lymphadenopathy. After basic clinical examination etiologies were shortlisted and appropriate investigations were done. Thyroid profile ,anticholinesterase antibodies ,imaging like CT brain and orbit, MRI brain and orbit, MR venogram and angiogram were carried out and diagnosis was confirmed. treatment was given according to the etiology. Recovery of diplopia was evaluvated by following up from 1 to 6 months after the initial visit. A decrease in 6 prism diopter and/or complete diminution of diplopia is considered to be recovery.

RESULTS:

A total of 82 patients were included in the study. Out of which 46 were men and 36 were female.

Table 1:AGE WISE DISTRIBUTION OF DIPLOPIA:

AGE RANGE (YRS)	NO OF PATIENTS
1-15	3
15- 30	14
30- 45	13
45 -60	43
60 -75	6
75- 100	3

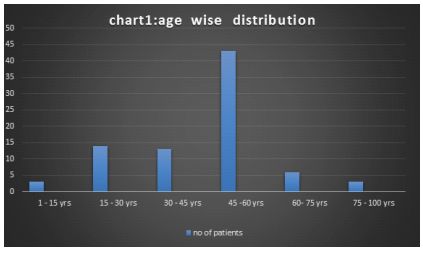


Table 3:DISTRIBUTION OF DIPLOPIA:

	MALE	FEMALE
VERTICAL	9	3
HORIZONTAL	32	22
OBLIQUE	1	-
MIXED	11	4

It is found that extraocular muscle palsy was common among middle aged people. Males were commonly affected. Etiologies are supranuclear ,cranial nerve palsy, neuromuscular junction disorders ,myopathic causes, orbital causes ,idiopathic.

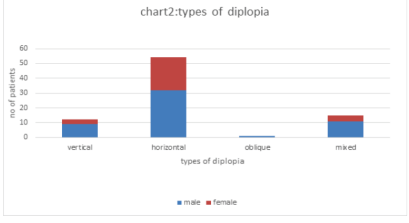
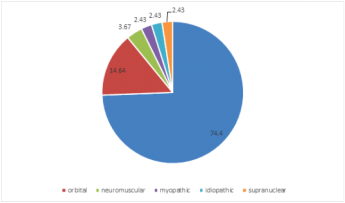


Table 2:CAUSES OF DIPLOPIA:

ETIOLOGY	NO OF PATIENTS	%
SUPRANUCLEAR	2	2.43
CRANIAL NERVE PALSY	61	74.40

NEUROMUSCULAR JUNCTION DISORDERS	3	3.67
MYOPATHIC	2	2.43
ORBITAL	12	14.64
IDIOPATHIC	2	2.43

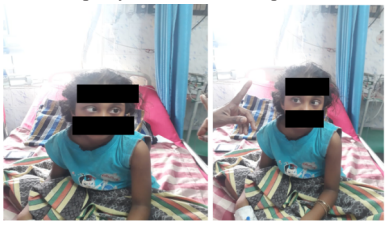


Out of 82patients, 2patients had diplopia due to supranuclear cause, 61patients suffered from cranial nerve palsy, 3patients suffered from NMJ disorders due to myasthenia gravis. 2 patients suffered from myopathic disorders, 12patients suffered from orbital disorders like peudotumour cerebri, orbital fractures ,thyroid eye disease ,2patients suffered from idiopathic causes. Hence ,from the above table we conclude that ,cranial nerve palsy is the most common cause of diplopia.

Table 4:DISTRIBUTION OF CRANIAL NERVE PALSY:

CRANIAL NERVE	MALE	FEMALE	AGE RANGE
THIRD	11	6	6- 68
FOURTH	1	-	23
SIXTH	23	18	2-56
MULTIPLE	1	1	46 -76

Among them sixth cranial nerve palsy is common which accounts for 67.21%. it is unilateral in 88.80% and bilateral in 11.20%. Fourth cranial nerve palsy is the least frequent cause



A CASE OF BILATERAL 6TH NERVE PALSY DUE TO MENINGITIS

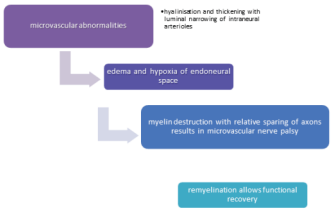
Most of our patients showed signs of recovery from 1- 6 months follow up. we have included 82 patients ,out of which 72 patients came for follow up. we looked for signs of recovery during follow up. we have found that diplopia due to diabetes , hypertension and atherosclerosis had good recovery. Similarly diplopia due to cavernous sinus thrombosis also had faster recovery. Other diplopia also showed signs of recovery when the disease pathology was treated . diplopia due to intracranial causes such as stroke ,space occupying lesions ,meningitis had slower recovery. 1 patient with pseudotumour did not recover since she was PLHA and there was difficulty in treating with steroids. 2 patients with space occupying lesion did not recover ,since they denied surgery for SOL. 2 patients due to myopathic causes also did not show recovery.

DISCUSSION:

According to our study, sixth cranial nerve palsy is the most common cause of acquired diplopia which accounts for 67.21% and it is bilateral in 11.20% . This is similar to study done by suman et al 59.65% and among them bilateral 6th nerve palsy is seen in 11.14%. Differentiating between idiopathic and vascular causes are challenging and is usually based on the presence of vascular risk factors.

In study done by James et al. males were affected more than the females ,which coincides with our study which was 59.05%.
. Bilateral multiple cranial nerve palsy can occur due to thyroid ophthalmopathy ,myasthenia gravis ,myopathic syndrome. Multiple cranial nerve involvement had slower recovery.

Patients with palsies due to vascular causes recovered irrespective of lesions. This is similar to the study done by clare et al 90.9% of 3rd nerve palsy recovered completely ,60% of all 4th nerve palsy recovered completely and 86% of 6th nerve palsy recovered completely. The reason behind good recovery is that there is focal ischaemia with demyelination and no axonal changes. Deficit is likely to be caused by conduction block rather than axonal damage which explains good recovery.



Supranuclear lesions rarely causes diplopia ,except for intern uclear ophthalmoplegia. Because supranuclear palsy are usually conjugate. A lesion in MLF results in internuclear ophthalmoplegia in which there is a disturbance in adduction ipsilateral to side of lesion. And nystagmus in contralateral abducting eye. If convergence is present ,it denotes posterior INO. If convergence is absent it refers to anterior INO. Bilateral INO is common in demyelinating disorders.

CRANIAL NERVE PALSIES:

Brainstem: Isolated lesions of the VI nerve nucleus will not give rise to an isolated VIth nerve palsy because paramedian pontine reticular formation fibers pass through the nucleus to the opposite IIIrd nerve nucleus. Thus, a nuclear lesion will give rise to an ipsilateral gaze palsy. In addition, fibers of the seventh cranial nerve wrap around the VIth nerve nucleus.

Subarachnoid space: As the VIth nerve passes through the subarachnoid space it lies adjacent to anterior inferior and posterior inferior cerebellar and basilar arteries and is therefore vulnerable to compression against the clivus. Typically palsies caused in this way will be associated with signs and symptoms of headache and/or a rise in ICP.

Petrous apex: The nerve passes adjacent to the mastoid sinus and is vulnerable to mastoiditis, leading to inflammation of the meninges, which can give rise to Gradenigo's syndrome. This condition results in a VIth nerve palsy with an associated reduction in hearing ipsilaterally, plus facial pain and paralysis, and photophobia. Similar symptoms can also occur secondary to petrous fractures or to nasopharyngeal tumours.

Cavernous sinus/Superior orbital fissure: The nerve runs in the sinus body adjacent to the internal carotid artery and oculo-sympathetic fibres responsible for pupil control, thus, lesions here might be associated with pupillary dysfunctions such as Horner's syndrome. In addition, III, IV, V1, and V2 involvement might also indicate a sinus lesion as all run toward the orbit in the sinus wall. Lesions in this area can arise as a result of vascular problems, inflammation, metastatic carcinomas and primary meningiomas.

Abducens nerve can be involved due to pathology of nerve itself or direct compression and transient dysfunction due to raised ICT. Diplopia is also increased on looking to the affected side and is partly caused by overaction if the medial rectus on the unaffected side as it tries to provide the extra innervation to the affected lateral rectus. These two muscles are synergists or yoke muscles as both attempt to move the eye over to the left or right. The condition is commonly unilateral but can also occur bilaterally. The pathophysiological mechanism of sixth nerve palsy with increased intracranial pressure has traditionally been said to be stretching of the nerve in its long intracranial course, or compression against the petrous ligament or the ridge of the petrous temporal bone.

Neuromuscular junction disorder: myasthenia gravis is an autoimmune disease in which antibodies are produced against acetylcholine receptors. This disorder is associated with variable diplopia and diurnal variation. Diagnosis is made by tensilon test , anticholine receptor antibodies titre, repetitive nerve stimulation test. Usually treated with pyridostigmine, neostigmine.

Myopathic:myopathic causes include muscular dystrophies and progressive myopathies. They usually present in childhood associated with other skeletal muscle abnormalities. Prognosis is usually poor.

Orbital: The VIth nerve's course is short and lesions in the orbit rarely give rise to isolated VIth nerve palsies, but more typically involve one or more of the other extraocular muscle group. Thyroid ophthalmopathy is a commonly encountered orbital cause of diplopia which is mostly corrected by appropriate pharmaological management. Other causes include orbital pseudotumor, orbital fractures with muscle entrapment

Idiopathic : patients were categorised to be idiopathic after all causes of diplopia has been excluded. All our patients were treated with occlusion therapy for diplopia.

CONCLUSION:

In our study, we conclude that,assessment of patient's history and systematic evaluvation makes the diagnosis of lesion easier. It also helps the neurologist arrive at intracranial lesion for earlier intervention as a life saving measure. Our analysis suggests that successful management of treatable underlying disease is the important factor for recovery of diplopia.

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