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CURRENT PRESENTATIONS OF OCULAR MOTOR NERVES PALSIES

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Abstract

Background: Ocular motor nerve palsies, in addition to being of visual inconvenience, might additionally point to a grave systemic disease. Though the ocular condition needs conservative treatment mainly, the underlying systemic condition might require emergent and/or prolonged treatment measures.

Patients and Methods: The aim of the present study was to find the current pattern of ocular motor nerve palsies. We retrospectively reviewed the case records of ninety-nine patients who presented to us with ocular motor nerve palsies. In addition to performing the appropriate examination and routine investigations, the radiological studies and specific investigations were performed where ever indicated.

Results: We found the abducens nerve to be most frequently paralysed followed by oculomotor nerve and trochlear nerve. Next to idiopathic ocular motor nerve palsies, trauma and vascular causes formed a common cause for ocular motor nerve involvements. Multiple cranial nerves were involved in 32% subjects. Bilateral affection was seen in 15% subjects. The vascular abnormalities were the most frequently found positive finding on radiological scans.

Conclusions: Our findings were, by and large, similar to those reported by other authors. Unlike previous authors we found a higher incidence of vascular causes and thereby vascular abnormalities on radiological scans; and lower incidence of neoplasms in our patients of oculomotor nerve palsies. We discovered optic atrophy to be a very common clinical feature in these patients. A baseline knowledge of the current pattern of ocular motor nerve palsies not only would help us to make a probable diagnosis of the underlying disease condition but also would be helpful in prescribing the appropriate investigation modalities for these patients.

Keywords: Ocular motor nerve palsies, Trochlear nerve palsy, Oculomotor nerve palsy,

INTRODUCTION

Ocular motility disturbance can be caused by various causes like myogenic, neurogenic, inflammatory, endocrine or restrictive pathologies. Out of these causes, a neurogenic pathology, forms an important cause for ophthalmoplegias.¹ There are a few studies in literature which describe different patterns of ocular motor nerve involvement in terms of frequency, presentations, associated systemic conditions and radiological findings.¹⁻¹⁰ We conducted a retrospective study on 99 patients who presented to us with ocular motility disorders. The aim of this study was to identify the pattern of ocular motility disorder in our clinical set up.

MATERIALS AND METHODS

A retrospective study was conducted on 99 patients diagnosed to have ocular motility disturbance at Neuro-Ophthalmology Clinic of Guru Nanak Eye Centre, New Delhi between January 1999 to December 1999. History for presenting ocular symptoms like diplopia, ptosis, diminution of vision and proptosis; systemic complaints like fever, headache, convulsions, unconsciousness; duration of these complaints; systemic diseases like diabetes, hypertension, tuberculosis, etc.; or trauma was elicited. An ophthalmological examination for assessment of visual acuity, anterior segment and posterior segment status, pupil size and reactions was undertaken. The ocular motor nerve paralysis was detected by objective examination techniques like Hess charting and diplopia charting. The computed tomography scan or magnetic resonance imaging scan of head and orbit was also done wherever indicated.

The subjects were conservatively managed with medical measures like multivitamins (Tablet neurobion or syrup polybion) and/or systemic prednisolone. For diplopia, the patients were given occlusion or prismatic correction (with glass prisms). The subjects were reexamined at successive intervals of two week. The duration for partial or complete recovery of healthy ocular motility status was noted.

RESULTS

99 patients including 59 males and 40 females in the age range of 1 year to 81 years who presented to us with ocular motility disturbance were enrolled in this study. Ten patients belonged to the age group of 12 years or less while 46 patients were in the age group of 35 years or more. Though we did not find any predilection for right or left side, right eye was found to be more frequently involved in sixth nerve affections and left eye was found to be more commonly

involved in third and fourth and other nerve paralysis.

These patients presented with ocular complaints like diplopia, ptosis, diminution of vision and proptosis after a varying duration of their onset that is fifteen days to two months. Diplopia was the commonest complaint in patients who had fourth nerve, sixth nerve or other nerve palsies while ptosis was commonest in patients having third nerve paralysis. The systemic complaints with which they presented included fever, headache, convulsions and unconsciousness; among which headache followed by fever were the commonest ones.

The sixth nerve was the most frequently affected one (62%) and this was followed by third nerve involvement (57%) and fourth nerve affection (27%). Thirty two patients had multiple cranial nerve involvement. Out of these, 18 had a combination of third, fourth and sixth nerve affection; 6 had third and fourth nerve involvement; 5 had third and sixth nerve affection; 2 had sixth and seventh nerve paralysis; and one had concurrent third, fourth and seventh nerve involvement. We did not find a concurrent third and fourth nerve involvement. The visual acuity in these patients ranged from 6/6 to 6/60 with no notable pattern of distribution in groups of patients with different ocular motor nerve palsies. Optic atrophy (46%) was the most common fundus finding in all the three groups though papilledema and fundus edema were also found. The field changes were seen very infrequently by us (2 patients).

While idiopathic ocular motor nerve palsies (57.0%) formed the largest number in all the three nerves' involvement, trauma (20.1%) followed by diabetes (16.8%) were the next most common causes responsible for these palsies. Other systemic conditions associated were tuberculosis (8.7%), hypertension (8.0%), chronic suppurative otitis media (1.3%), herpes zoster ophthalmicus (2.0%), meningitis (2.0%), meningioma (2.0%), epilepsy (1.3%), tumors (2.0%) and hemifacial spasms (0.7%).

Bilateral involvement i.e. ocular motor nerve palsy in both eyes simultaneously, was seen in 15% patients and out of these five patients had all the three nerve affected, five subjects had only sixth nerve involvement; one patient had only fourth nerve involvement and four patients had involvement of third nerve only. Out of these patients, one patient had tumor, one had tuberculosis and in the rest the cause was undetermined.

Though the radiological studies either through comput-

erized tomographic scan or through magnetic resonance imaging scan were usually found normal, vascular abnormalities were the most commonly encountered positive finding. In almost all the patients these nerves took more than two months for appearance of any sign of recovery of their function.

DISCUSSION

While some authors have found that ocular motor nerve palsies are more common in subjects above 35 years of age,^{1,2} others have seen this disease condition more common between 18-74 years.³ In our study too, the mean age of the patients was about 35 years. Different studies have reported the males to be more often affected,^{1,3} a trend seen by us too. Unlike us, the previous workers have not noticed any side predilection.^{1,2,4,5}

The diagnosis for location and cause of lesion for appearance of motor nerve palsy can more certainly be made for patients having additional neurological symptoms.³ Diplopia is the most common presentation in trochlear palsy⁶ and this was similar to our finding.

The abducens nerve has been found to be the commonest to be involved, followed by oculomotor and trochlear nerve while multiple cranial nerve palsies were the least commonly found.^{2,3,7} The incidence of abducens nerve involvement has been found to lie between 29.13%¹ to 41.9%;² of oculomotor nerve varies between 24.91%¹ to 29%² and of trochlear involvement ranged from 7.2%⁴ to 17.2%.² We found the sixth nerve to be involved in 62% of our subjects and this was followed by third nerve involvement (57%) and fourth nerve affection (27%). Maruo and Kubota, however, state that oculomotor nerve palsy is the most frequent one;⁸ while Kobashi et al found trochlear nerve palsy to be the most commonly affected one.¹

Usually the largest group of patients with ocular motor nerve palsies have been found to be idiopathic^{2,3,4,5} and the incidence of idiopathic cases varies from 14-28%.^{2,3,4,5} Following this, vascular causes, trauma and tumors form the next common group.⁵ While abducens nerve has been found to be more commonly associated with tumors, trochlear nerve has been found to be paralysed in patients with a history of trauma.^{1,3,6} We made a similar observation. Though visual acuity in our patients varied from 6/6 to 6/60, we cannot relate the vision to motor nerve involvement alone as these patients had concurrent presence of refractive errors, and diseases like cataract, glaucoma, age related macular degeneration, etc. Previous workers have not described the fundus changes and field changes in their patients. We however, found the optic atrophy to be the commonest fundus finding.

The incidence of bilateral ocular motor nerve palsy has been found to be 8% by Rush and Younge² and 5% reported by Shrader and Schleringer.⁹ Like other studies,² among the patients with a bilateral involvement we found sixth nerve affection to be the commonest.

Kobashi et al however, found trochlear nerve palsy to be most commonly bilateral.¹

The incidence of multiple cranial nerve involvement which has been previously reported is about 11.9%.² The most frequently seen pattern of cranial nerve involvement in multiple affections is the palsy of all the three ocular motor nerves,^{1,2} which was what we also found.

We did not encounter any patient with a concurrent third and fourth nerve involvement a combination which other authors encountered.¹ Though other authors found tumors like infratentorial neoplasms, metastatic tumors and pituitary adenomas to be the most common cause for a multiple cranial nerve involvement,² we found idiopathic cases followed by those caused by diabetes to be the commonest. Almost 40% patients with multiple cranial nerve palsies remit partially or completely.² Richards et al recommend extensive

work up for the patients having combined palsies without obvious causes.³

We found that vascular abnormalities were the most frequently detected positive finding on the radiological scans of our patients. Previous workers have noted a decline in aneurysm related cases probably because of timely diagnosis due to better diagnostic techniques.^{2,4} Richards et al state that since younger patients are more likely to have tumors and sustain trauma diagnostic approach should be more aggressive in these.³

The patients with isolated palsies and those with vascular causes for involvement recovered at a higher rate,³ while prognosis was poor in patients having multiple cranial nerve palsies.² Prognosis was the best in vascular group, and better than 50% in all groups except tumors.^{1,2,3} The patients with palsies caused by aneurysms, trauma and undetermined causes were predictably less likely to recover^{1,2,3} though those with neoplasms had the worst prognosis.³ The highest spontaneous recovery rate was found to be that for abducens nerve (38%) followed by trochlear nerve (34%) while it was significantly low for oculomotor nerve.¹ The mean recovery time was 5.4 months while the range was from less than one month to 48 months. In our study, though the patients with ocular motor palsies due to vascular causes recovered almost all of them took more than two months for recovery. We found more quick recovery in patients having sixth nerve palsy followed by those having fourth or third nerve palsy while other authors noted somewhat different pattern.² Richards et al also studied the recurrence rate and found that the patients with vascular causes and those having palsies of idiopathic origin and in children recovered inspite of recurrences.³ We did not determine the recurrence rate of ocular motor nerve palsies in our patients.

Once the clinician comes across the ocular motor nerve palsy, it is not mandatory to perform the complete neuro-ophthalmologic evaluation and clinical judgement has to be used to reach the diagnosis if possible.³ In patients with ocular motor nerve paralysis, baseline measurement for the ocular motor nerve function should be done. Conservative management has been recommended for elderly patients who are relatively symptomless and have no systemic disease; and in those having diabetes or hypertension but without obvious neurological problem.³ However, a close watch should be made for any accompanying problem like aneurysm.³ While waiting for recovery, complete or partial occlusion of spectacle lenses is helpful.³ Later on some surgical procedure or prism therapy might ultimately be needed to restore binocularity if recovery is insufficient.³

REFERENCES

1. Kobashi R, Ohtsuki H, Hasebe S. Clinical studies of ocular motility disturbances. *Jpn J Ophthalmol.* 1996;40:502-510.
2. Rush JA, Younge BR. Paralysis of cranial nerves III, IV and VI. *Arch Ophthalmol.* 1981;99:76-79.
3. Richards BW, Jones FR, Younge BR. Causes and prognosis in 4278 cases of paralysis of the oculomotor, trochlear and abducens cranial nerves. *Am J Ophthalmol.* 1992; 113:489-496.
4. Rucker CW. The cause of paralysis of the third, fourth and sixth cranial nerves. *Am J Ophthalmol.* 1966;61:1293-98.
5. Rucker CW. Paralysis of the third, fourth, and sixth cranial nerves. *Am J Ophthalmol.* 1958;46:787-794.
6. Mansour AM and Reinecke RD. Central trochlear palsy. *Surv Ophthalmol.* 1986;30:279.
7. Senou K, Kiribuchi T, Maruo T. Incidence of congenital and acquired ophthalmoplegia. *Rinsaho Ganka (J Jpn clinical Ophthalmology).* 1983;37:817-205.
8. Maruo T & Kubota N. Statistical study of ophthalmoplegia. *Nihon Ganka Gakki Zasshi (Acta Soc Ophthalmol Jpn).* 1969;73:577-588.
9. Shrader EC, Schlezinger NS. Neuroophthalmologic evaluation of abducens nerve paralysis. *Arch Ophthalmol.* 1960;63:84-91.
10. Gabianelli EB, Klingele TG and Burde RM. Acute oculomotor nerve palsy in childhood. Is arteriography necessary? *J Clin Neuro-Ophthalmol.* 1989;9:33.