

Clinical and Etiological Study of Ocular Motor Nerve Palsies in a Tertiary Care Hospital

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Abstract

Purpose: The purpose of the study was to provide clinically relevant information regarding the diagnosis, etiology, and work-up of ocular motor nerve palsies (OMNPs).

Materials and Methods: Thirty consecutive patients with OMNPs were investigated. All the patients were evaluated through a multidisciplinary approach comprising collaboration between the departments of ophthalmology, neurology, otorhinolaryngology, and internal medicine. Computerized tomography (CT) scan imaging of the brain and complementary laboratory tests were done for all the patients.

Results: Isolated OMNPs were seen in the majority of the patients with the third and the sixth cranial nerve being affected in 53.3% (19) and 32.3% (10), respectively. One case of combined OMNP (third+sixth+fourth cranial nerves) was reported. The majority of eyes (62.5%) with third cranial nerve palsy had pupil sparing presentation. Complete ptosis and full mydriasis were mostly seen in isolated cases of the third cranial nerve palsy. Overall, an etiological diagnosis was made in 93.3% of cases. The common causes were vascular conditions (46.7%), otorhinolaryngologic diseases (6.7%), and trauma (20%). CT scan failed to reveal any abnormality in 53.4% of cases.

Conclusion: Our study stresses the importance of a multidisciplinary collaborative approach in the evaluation of patients with ocular motor nerve palsy, especially where sophisticated, complementary investigations are impossible.

Key words: Computerized tomography, Etiology, Ocular motor nerve palsy, Ptosis, Pupil

BACKGROUND

Ocular motor nerve palsies (OMNPs) are commonly encountered in clinical practice and usually give us an insight into the underlying local, regional, or general diseases. They may be unilateral or bilateral, isolated, or combined type of involvement, and may be obvious or subclinical. To find out the etiology, it is important to carry out a careful clinical examination with supportive complementary investigations. This approach is known as "anamnesis."^[1] To increase the chance of identifying the causes of OMNPs, a close collaboration between different specialties, that is, a multidisciplinary approach has been

recommended. This short paper presents the result of the clinical and etiological aspects of OMNPs after using such a collaborative approach.

MATERIALS AND METHODS

Thirty consecutive patients with OMNP were enrolled and examined at the Department of Ophthalmology, K.R. Hospital, MMCRI, Mysuru, from August 2017 to May 2018.

An arrangement about the protocol was made with the department of otorhinolaryngology, internal medicine, and neurology for their collaboration. They were especially asked to perform the investigation needed free of charge. In case of difference of opinion, a meeting was held among the ophthalmologists and other investigators to arrive at a consensus.

Each patient underwent a complete ophthalmologic evaluation as a part of the detailed anamnesis. The anamnesis

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also focused on risk factors in past and/or current ocular and general medical history and current or past medications. The thorough ocular examination included the following. Visual acuity was measured using conventional methods. Tests for ocular motility and ocular deviation were done in all nine directions of gaze and evidence of strabismus was assessed with cover-uncover test. The upper lids were evaluated for ptosis by measuring the distance between the upper and lower margins using a transparent graduated rule. Ptosis was further classified into mild (4–8 mm), moderate (2–4 mm), and complete (<2 mm). Pupillary light reflexes were checked and documented. The red-green glass was used to investigate the diplopia. Furthermore, patients underwent neurological, cardiovascular, endocrinologist, and otorhinolaryngologic examinations and computerized tomography (CT) scan imaging study. Cases of congenital OMNPs were not included in the study. Issues regarding the site of the lesion were out of the scope of this study and were, therefore, not included.

RESULTS

The frequency distribution of different forms of OMNPs in our study was as follows [Table 1]. Isolated OMNPs were seen in the majority of the patients with the third and the sixth cranial nerve being affected in 53.3% (19) and 32.3% (10), respectively. One case of combined OMNP was reported.

Symptoms, as reported by the patients at presentation, were as follows: Ptosis in 20 patients (66.7%) and ocular deviation in 8 patients (26.7%).

Clinical examination did not reveal any case of visual impairment.

Out of 19 eyes with the 3rd cranial nerve palsies, 6 cases (31.57%) have pupil involvement, that is, presented with mydriasis while the remainder (68.42%) were pupil sparing. Furthermore, it was observed that pupil involvement was found to be more frequently associated with isolated 3rd nerve palsy cases [Table 2]. Ptosis was observed in all cases of the third nerve palsy [Figure 1].

Table 1: The frequency distribution of different forms of OMNPs

Cranial nerve palsy	3 rd nerve	6 th nerve	Combined (3 rd +6 th +4 th nerve)	Total
No. of patients	19	10	1	30

Table 2: Clinical presentation of the third nerve palsy cases

Patients with	Isolated 3 rd nerve (n=19)	Combined (n=1)	Total	Percentage
Pupil involvement	6	1	7	35
Ptosis	19	1	20	66.7

Overall, an etiological diagnosis could be made in 28 patients (93.4%). The common causes were vascular in 18 patients (60%), craniofacial trauma in 70 patients (23.4%), and otorhinolaryngologic diseases in 2 patients (6.7%). One patient had Herpes Zoster ophthalmicus (HZO) [Table 3].

CT scan failed to reveal any abnormality in 53.4% of cases.

DISCUSSION

The etiology of OMNPs remains categorized as idiopathic in more than 7% of cases.^[2,3] Due to the marked progress in the field of imaging studies, our chances of arriving at an etiological diagnosis have improved significantly.^[4] Our protocol based on a tight multidisciplinary collaboration has allowed us to determine the cause of OMNP in most cases even in the absence of advanced imaging techniques such as magnetic resonance imaging.

As per several previous reports,^[5,6] isolated cases of OMNP were more frequent in our study.

Paralysis of the sixth cranial nerve is recognized as the most common type, in most of the series^[3,7] throughout the literature, even though in some series,^[5,6] the third cranial nerve was the most affected. The latter being the case in our study. The low frequency of the fourth cranial nerve involvement can be explained due to the fact that congenital cases were excluded. Indeed, palsy of the fourth cranial nerve is mostly found to be congenital according to many sources.^[8-10]

Ptosis in connection with the 3rd CN palsy was the most common presentation which was of varying degrees. All patients with mild ptosis were not aware of the abnormality. Moreover, in such cases, ptosis was not very obvious even on clinical examination until it was objectively measured. Should any doubt arise, we suggest that objective measurement be done to confirm the presence or absence of ptosis in cases of the 3rd CN palsy.

We also encountered a patient diagnosed with HZO who presented to us with symptoms of the third nerve palsy.

Head trauma-related OMNPs were not excluded from this series of patients which has substantially contributed to the proportion of causes found. The limitation of a

Table 3: Causes of OMNPs

Causes	3 rd (n=19)	6 th (n=10)	Combined (n=1)	Total	Percentage
Diabetes	14	4		18	60.0
Trauma	4	2	1	7	23.4
ENT		2		2	6.7
Herpes zoster ophthalmicus	1			1	3.2
Unknown		2		2	6.7



Figure 1: Third nerve palsy with ptosis

small sample size in our study can be considered to be counterbalanced by the advantage provided by our strict protocol of a multidisciplinary approach.

It is well known that the resolution power and, subsequently, the probability of disclosing lesions are lower with CT scan than with MRI. This can help explain the fact that CT scan imaging failed to reveal any anomaly in 53.4% of the cases in our study. In addition, most cases were due to vascular and inflammatory causes, which are known to be hardly recognizable on CT scan images. This furthermore sheds light on the necessity for a multidisciplinary approach in all neuro-ophthalmology cases, especially in a developing country like ours where access to MRIs is still limited.

CONCLUSION

Our study stresses the importance of a multidisciplinary collaborative approach in the evaluation of patients with

ocular motor nerve palsy, especially where sophisticated, complementary investigations are impossible.

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