

Original Article

A clinical and etiological study of ophthalmoplegia at a tertiary care hospital in South India

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Abstract:

Background: Appropriate management of ophthalmoplegia demands good anatomy knowledge of cranial nerves involved i.e., III, IV and VI. Where these nerves originate and where they end, clinical features associated with paralysis of each nerve all this knowledge help in proper management of cases.

Objective: To study clinical and etiological factors associated with the ophthalmoplegia

Methods: Prospective, Hospital based observational study was carried out among 50 cases of ophthalmoplegia. Detailed history was recorded. Thorough clinical examination including examination of both the eyes was carried out in terms of laterality, pupils affected or not, Central nervous system involvement, cranial nerves III, IV and VI etc. Papilledema, blood pressure, fasting blood sugar were investigated for each case.

Results: Most common age group affected was >50 years in 50%. Males were slightly more affected than females. Majority (72%) cases were bilateral. Only nine cases had affected pupils. In ten cases, central nervous system was affected. Hypertension was seen in 32% and diabetes in 44%. 14% had history of trauma. Inflammation, tumor and vascular affection was seen in three cases each. Four cases had viral infection. Among all factors, diabetes was significantly associated with III cranial nerve involvement ($p < 0.05$). Hypertension was significantly associated with IV cranial nerve involvement ($p < 0.05$). But no factor was significantly associated with VI cranial nerve involvement ($p > 0.05$).

Conclusion: We conclude that ophthalmoplegia mainly affects elderly and males. It is usually bilateral and sometimes pupils and CNS are affected. Hypertensives and diabetics are at an increased risk of ophthalmoplegia.

Key words: Ophthalmoplegia, cranial nerve, morbidity, papilledema

Introduction:

Ophthalmoplegia is the paralysis or weakness of the eye muscles. It can affect one or more of the six muscles that hold the eye in place and control its movement. ¹

It has been estimated that the prevalence of ophthalmoplegia is around 0.32%. Among those with the ophthalmoplegia, most common lesion is due to the involvement of cranial nerve VI in 53.11% of the cases followed by cranial nerve III in 36.36% of the cases and 2.8% in cases of palsy due to cranial nerve IV. Older age more than 45 years, prolonged diabetes are important risk factors of ophthalmoplegia. Other factors like having retinopathy or those also having nephropathy at an increased risk of developing ophthalmoplegia. There is paralysis of not only extraocular muscles but also weakness of the intraocular muscles. These muscles are supplied by the cranial nerves III, IV and VI. Ophthalmoplegia can be either congenital or acquired. It can be partial or complete. It may be internal or external. In some cases, pupils are involved whereas in some cases the pupils are spared. Some patients may have pain and some may not have. It can be isolated or in some few cases it may be multiple where there is more involvement of the neurological damage. ² Appropriate management of ophthalmoplegia demands good anatomy knowledge of cranial nerves involved i.e., III, IV and VI. Where these

nerves originate and where they end, the clinical features associated with paralysis of each nerve all this knowledge help in proper management of the cases. ³⁻⁵

Pupil sparing palsies are due to medical reasons like diabetes, hypertension & collagen vascular diseases. Pupil involving palsies are due to surgical space occupying lesions such as vascular aneurysms. Benign Ophthalmoplegias are due to post viral demyelination and have a good chance of recovery. So is the case with diabetic ophthalmoplegias due to the micro vascular ischemia. ⁶

They can be a sign of serious underlying pathology such as intracranial aneurysms. Total or near ophthalmoplegia associated with pain is mainly due to lesion in superior orbital fissure, other orbital lesions, cavernous sinus lesion, Para nasal sinuses lesions, orbital apex lesion. ^{7,8}

This study was carried out to study the clinical and etiological factors associated with the ophthalmoplegia.

Methods:

Prospective, Hospital based observational study was carried out over a period of two years in the department of Ophthalmology at Malla Reddy Institute of Medical Sciences & Hospital among 50 confirmed cases of ophthalmoplegia.

Institutional Ethics Committee permission was obtained after submitting the protocol first to the Scientific Committee and then to the Ethics Committee. Written informed consent was obtained from the study participants.

Patients with acquired Ophthalmoplegias with a recent onset (within 2-3 weeks), age group 5 – 70 years of either gender, ophthalmoplegias associated with general neurological signs and symptoms and acceptance of patients to undergo investigations whenever needed were included in the present study. Patients with congenital Ophthalmoplegia, ophthalmoplegia due to myogenic, myasthenia and restrictive causes, patients who are terminally ill and unconscious, ophthalmoplegias secondary to neurosurgical causes and only Internal Ophthalmoplegia cases were excluded from the present study.

Detailed history pertaining to age, sex, known case of diabetes, history of trauma etc. was recorded in the pre-designed, pre-tested, semi-structured study questionnaire. Thorough clinical examination including examination of both the eyes of the included cases was carried out. Laterality was noted as unilateral or bilateral. Pupils were examined to see if they affected due to ophthalmoplegia. Central nervous system involvement was examined. Ophthalmoscopic examination was carried out to study the presence of papilledema. Blood pressure was measured as per standard guidelines. Those who are not the known cases of diabetes, fasting blood sugar was done to find out the presence of diabetes as per standard guidelines. Examination of the cranial nerves III, IV and VI was carried out as per standard guidelines.

The data was entered in the Microsoft Excel worksheet and analysed using proportions. For comparison of proportions, chi square test or Fischer exact test was applied as appropriate to calculate the p value. If it is less than 0.05, it was taken as statistically significant.

Results:

Table 1: Distribution of cases as per demographic and clinical characteristics

Characteristics		Number	Percentage
Age (years)	10-30	11	22
	31-50	14	28
	> 50	25	50
Sex	Male	28	56
	Female	22	44
Laterality	Bilateral	14	28
	Unilateral	36	72
Pupil affected	Yes	9	18
CNS Affected	Yes	10	20
Papilledema	Yes	4	8
Hypertension	Yes	16	32
Diabetes	Yes	22	44
Trauma	Yes	7	14
Inflammation	Yes	3	6
Tumor	Yes	3	6
Viral infection	Yes	4	8
Vascular	Yes	3	6

Most common age group affected was above the 50 years in 50% of the cases. Males were slightly more affected than females. Majority (72%) cases were bilateral. Only nine cases had affected pupils. In ten cases, the central nervous system was affected. Hypertension was seen in 32% and diabetes in 44% of the cases. 14% had history of trauma. Inflammation, tumor and vascular affection was seen in three cases each. Four cases had viral infection. (Table 1)

Table 2: Association between risk factors and III cranial nerve involvement

Risk factors	III cranial nerve involvement		p
	Yes (N=20)	No (N=30)	
Hypertension	10(50%)	6(20%)	0.05506
Diabetes	13(65%)	9(30%)	0.03142
Trauma	2(10%)	5(16.7%)	0.8029
Viral infection	1(5%)	3(10%)	0.9153
Vascular	5(25%)	3(10%)	0.3079
	IV cranial nerve involvement		
	Yes (N=13)	No (N=37)	
Hypertension	1(7.7%)	15(40.5%)	0.01078
Diabetes	4(30.8%)	18(48.6%)	0.4281
Trauma	2(15.4%)	5(13.5%)	0.7662
Viral infection	0	4(10.8%)	--
Vascular	1(7.7%)	7(18.9%)	0.6100
	VI cranial nerve involvement		
	Yes (N=12)	No (N=38)	
Hypertension	1(8.3%)	15(39.5%)	0.09672
Diabetes	2(16.7%)	20(52.6%)	0.06367
Trauma	2(16.7%)	5(13.2%)	0.8636
Viral infection	3(25%)	1(2.6%)	0.06509
Vascular	1(8.3%)	7(18.4%)	0.7044

Among all the factors, diabetes was found to be significantly associated with the III cranial nerve involvement ($p < 0.05$). Hypertension was found to be significantly associated with the IV cranial nerve involvement ($p < 0.05$). But no factor was significantly associated with the VI cranial nerve involvement ($p > 0.05$). (Table 2)

Discussion:

Most common age group affected was >50 years in 50%. Males were slightly more affected than females. Majority (72%) cases were bilateral. Only nine cases had affected pupils. In ten cases, central nervous system was affected. Hypertension was seen in 32% and diabetes in 44%. 14% had history of trauma. Inflammation, tumor and vascular affection was seen in three cases each. Four cases had viral infection. Among all factors, diabetes was significantly associated with III cranial nerve involvement ($p < 0.05$). Hypertension was significantly associated with IV cranial nerve involvement ($p < 0.05$). But no factor was significantly associated with VI cranial nerve involvement ($p > 0.05$).

Curone M et al⁹ reviewed cases of ophthalmoplegia associated with pain in retrospective manner taking cases from last 20 years. With given criteria, in last 20 years, they were able to find 23 such cases. Among them benign form of the disease was seen in 52% of the cases. 48% of the cases were found to be symptomatic. The authors concluded that there is a need for specific nosography for benign forms of the cases.

Agrawal PK et al¹⁰ studied 62 cases of ophthalmoplegia. The mean age was 31.9 years but in the present study 50% of the cases above the age of 50 years. They found that the males were twice affected compared to that of females. We also found that 56% of the males were affected compared to 44% of the females. The author noted that some cases had pain associated with their presentation. They also observed that in the 83.9% of the cases isolated ocular nerve was affected. They noted that the most commonly affected nerve was VI cranial nerve in 45.2% of the cases. Whereas we found that cranial nerve III was most commonly affected in the present study in 40% of the cases.

Behera RK et al¹¹ studied etiology of ophthalmoplegia in Southern Odisha among 50 cases. They noted that most of the cases were in the age group of 61-70 years and males were affected more compared to that of the females. We also observed that almost half of the cases were in the age group of more than 50 years and males were more than females. Unilaterality was seen in 98% of the cases in the author study compared to 72% in the present study.

The author found that in 40% of the cases the abducens nerve was affected. In 54% of the cases from their study, mydriasis was not seen. They concluded that vascular lesion was the most common cause of ophthalmoplegia in their study.

Dinesh P et al¹² studied 35 cases of oculomotor nerve paralysis. They found that in almost 75% of the cases the injury was seen in isolated oculomotor nerve. Remaining cases were multiple. The most common cause was found out to be microvascular ischemia in 40% of the cases. Among them 31.4% of the cases recovered. He concluded that isolated nerve lesion was the most common cause with microangiopathy as the most common etiology.

Conclusion:

We conclude that ophthalmoplegia mainly affects elderly and males. It is usually bilateral and sometimes pupils and CNS are affected. Hypertensives and diabetics are at an increased risk of ophthalmoplegia.

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