

A STUDY ON THE AETIOLOGY OF ABDUCENS NERVE PALSY AND ITS RECOVERY

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ABSTRACT

BACKGROUND

Abducens nerve may present in one of four ways- 1) An isolated partial or complete nerve palsies without any other neurologic signs and symptoms except those related to the palsy itself. 2) In association with symptoms other than those related to the palsy (pain, dysesthesia, paraesthesia), but without any signs of neurologic (or) systemic disease. 3) In association with other ocular motor nerve palsies, but without any other neurologic signs. 4) In association with neurologic signs other than the oculomotor nerve palsy.

MATERIALS AND METHODS

The present study was conducted in Ophthalmic OPD of Government Medical College and Hospital, Anantapur, Andhra Pradesh. 26 cases were examined by proper history taking, complete neurological examination by neurologist and ocular examination to include and exclude the cases properly and the study period was from February 2013 to January 2017. All patients having infranuclear neurologic lesion of VI cranial nerve who attended the ophthalmology OPD were included in the study after taking an informed consent.

RESULTS

Of them, 17.5% of the cases are due to undetermined causes, 3.5% of the cases are due to neoplasms, 7% of the cases are due to vascular pathologies (diabetes mellitus, hypertension, etc.), 3.5% of the cases are due to aneurysms, 48.9% of the cases are due to nonspecific neuritis, 19.6% of the cases are due to various other pathologies.

CONCLUSION

Of all the causes, nonspecific neuritis is the most common cause followed by undetermined causes and vascular pathologies (diabetes mellitus, hypertension, etc.).

KEYWORDS

Abducens Nerve, VI Nerve Palsy, Diabetes Mellitus, Hypertension.

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BACKGROUND

The abducent nerve (sixth cranial nerve) is a small, entirely motor nerve that supplies the lateral rectus of the eyeball. The factors causing disturbances in the nuclei and nerve paths of the VIth cranial nerve are extremely varied and their study opens up a large field not only of disease of the central nervous system, but also of the cardiovascular and other systems of the body as well as disturbances in the basal meninges, the chiasmal and orbital regions; it is a subject full of interest providing abundance of opportunity for diagnostic acumen. But, it must be remembered that, despite its diversity or rather because of it, a considerable number (probably some 15 to 20%) of cases always remains undiagnosed and must be classified as of uncertain aetiology despite the most careful investigation. There are many causes for abducens nerve palsy. In these cases, the VI

nerve has already left the nucleus, so the lesions affect only one side. There are various syndromes, which can occur depending on the site of lesion. They are due generally to inflammatory, ischaemic and infiltrative lesion. An isolated palsy of sixth nerve is never nuclear in origin.² Patients with VI cranial nerve palsy presents with the following symptoms-³ An abnormality of the VIth nerve is the most likely cause of strictly horizontal double vision. The patient presents with the following signs- Limitation of abduction, esotropia in primary position, horizontal diplopia, there is turning of face towards the affected side to avoid diplopia.

Aims of the Study

1. To study and determine the aetiology of infranuclear lesions of VIth cranial nerve palsy.
2. To study the recovery of patients from various causes of abducens nerve palsy.

Inclusion Criteria- All infranuclear neurogenic lesions of VIth cranial nerve.

Exclusion Criteria- Patients with supranuclear, nuclear, myogenic and neuromuscular afflictions and other cranial nerve palsies were excluded from the study by doing suitable examinations and investigations.

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MATERIALS AND METHODS

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RESULTS

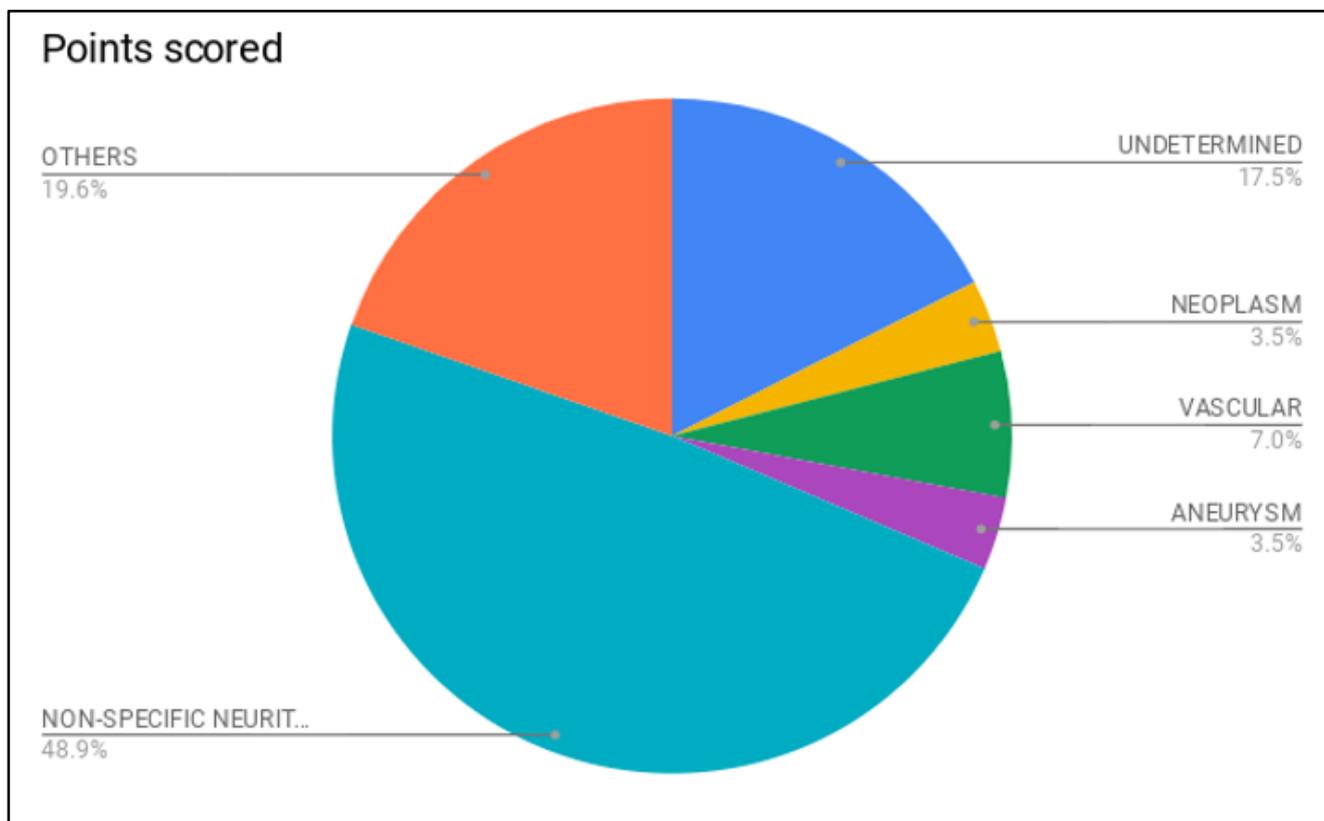


Figure 1. Pie Diagram Showing Incidence of Various Diseases Due to Various Causes in Present Study

| Causes | Rush and Younger et al ⁴ (1981) % | Richards, Younger et al ⁵ (1992) % | Menon et al ⁶ (1983) % | Present Series (2017) % |
|----------------------|--|---|-----------------------------------|-------------------------|
| Undetermined | 29.6 | 26.22 | 36.3 | 17.5 |
| Head trauma | 16.7 | 14.59 | 10.2 | - |
| Neoplasm | 14.6 | 21.53 | 12.5 | 3.5 |
| Vascular | 17.7 | 12.51 | 10.2 | 7.0 |
| Aneurysm | 3.6 | 3.02 | - | 3.5 |
| Nonspecific neuritis | - | - | 12.4 | 48.9 |
| Other | 17.4 | 21.74 | 18.18 | 19.6 |

Table Showing Incidence of Abducens Nerve Palsy Due to Various Causes in Present Study and Comparison with Other Studies

In the present study, 17.5% of the cases are due to undetermined causes, 3.5% of the cases are due to neoplasms, 7% of the cases are due to vascular pathologies (diabetes mellitus, hypertension, etc.), 3.5% of the cases are due to aneurysms, 48.9% of the cases are due to nonspecific neuritis, 19.6% of the cases are due to various other pathologies.

DISCUSSION

There are many causes of abducens nerve palsy.⁷ They are- 1) Acute and subacute ophthalmoplegia (infective encephalitis, organismal encephalitic conditions, acute CNS diseases), neuritic infections (polyradiculoneuritis, interstitial neuritis), toxic conditions (diphtheria, tetanus, botulism),

allergic conditions (sarcoidosis, recurrent multiple cranial nerve palsies), III. Intoxications from exogenous poisons (lead, carbon monoxide) metabolic conditions like (vitamin B1, B3, C deficiency states), vascular lesions (atherosclerosis, haemorrhage and thrombosis in midbrain), neoplasms and cysts, trauma affecting the midbrain; 2) Chronic and progressive ophthalmoplegia- Tables and general paralysis, multiple sclerosis, diffuse sclerosis, syringomyelia (syringobulbia), amyotrophic lateral sclerosis; 3) Episodic ophthalmoplegia- Ophthalmoplegic migraine, D. Aberrant nerve regeneration. Nuclear palsies are due to inflammatory, degenerative, toxic, vascular, neoplastic or traumatic processes. Undetermined causes and vascular pathologies are more in study of Rush and Younger et al.

Cases due to neoplastic causes are more in study of Richards and Younge et al. Nonspecific neuritis is more common in this present study. A study of 1961 diabetic patients by Watanabe K et al⁸ showed that the incidence of cranial palsies in diabetics was significantly higher than that in nondiabetic patients. Recovery depended on the aetiology. Recovery was faster in nonspecific neuritis group. Patients with uncontrolled diabetes and diabetes of more duration showed slow recovery. Patients with hypertension recovered faster than diabetics. Recovery was better and faster when the patient presented early. Recovery was good in patients who had nonspecific neuritis patients who presented early and in diabetic patients who are euglycaemic patients with VIth nerve palsy.

CONCLUSION

The abducens nerve palsy has multiple and varied aetiologies. Of 26 cases of VIth cranial nerve palsy, 12 cases showed full recovery. This group belonged to the nonspecific neuritis. Recovery depended on the aetiology. Recovery was faster in nonspecific neuritis group. Patients with uncontrolled diabetes and diabetes of more duration showed slow recovery. Patients with hypertension recovered faster than diabetics. Recovery was better and faster when the patient presented early. History, careful ophthalmic and neurological evaluation, basic investigations revealed the aetiology in most cases. CT and MRI are invaluable in the

diagnosis though financial constraints limit the use of these sophisticated investigations.

REFERENCES

- [1] Miller NR, Newman NJ. Walsh and Hoyt's clinical neuro ophthalmology. 5th edn. Baltimore: Williams & Wilkins 1998:p. 377.
- [2] Moster ML, Savino PJ, Sergott RC, et al. Isolated sixth nerve palsies in younger adults. Arch Ophthalmol 1984;102(9):1328-1330.
- [3] Dennis M, Bowen WT, Cho L. Mechanisms of clinical signs. E-Book. Australia: Elsevier 2012:267.
- [4] Rush JA, Younge BR. Paralysis of cranial nerves III, IV, and VI. Cause and prognosis in 1,000 cases. Arch Ophthalmology 1981;99(1):76-79.
- [5] Richards B, Jones FR, Younge BR. Causes and prognosis in 4,278 cases of paralysis of the oculomotor, trochlear, and abducens cranial nerves. Am J Ophthalmology 1992;113(5):489-496.
- [6] Menon V, Singh J, Prakash P. Aetiological patterns of ocular motor nerve palsies. Ind J Ophthalmol 1984;32(5):447-453.
- [7] Michael C. Brodsky pediatric neuro-ophthalmology. 3rd edn. New York: Springer 2016:p. 334.
- [8] Watanabe K, Hagura R, Akanuma Y. Characteristics of cranial nerve palsies in diabetic patients. Diabetes Res Clin Pract 1990;10(1):19-27.