

A Clinical Study of Multiple Cranial Nerve Palsies

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ABSTRACT

Aim: The aim of study was to examine the seats and causes of multiple cranial neuropathies 50 patients who attended at tertiary care Hospital, Karimnagar.

Materials and Methods: The study was a cross sectional study includes with multiple cranial nerve palsies. The study was conducted in Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar between September 2016 to December 2018. Data were collected on age, sex, type of cranial nerve palsy, history of diseases such as diabetes mellitus, hypertension and cardiovascular disease.

Results: Total 50 patients with multiple cranial neuropathy met the inclusion criteria, out of which 31(62%) were males and 19(38%) were females. Vascular disease was responsible for 20 (40%) of the 50 cases. Out of 20 cases of vascular disease, acute stroke was responsible for 16 cases, Ischemic polyneuropathy was responsible for 3 cases, CSVT is responsible for one case.

Conclusion: In our study showed that vascular causes constitutes most common cause of cranial neuropathy. Mean age of presentation of vascular disease was 50.5 years, in which male patients are affected in 65% of cases and female patients are affected in 35%.

Keywords: Multiple Cranial nerve, neuropathy, vascular disease

INTRODUCTION

The Cranial nerve palsies can be congenital or the result of traumatic or vascular disorders (hypertension, diabetes mellitus (DM), stroke, aneurysms). They can also be due to infections, migraine headaches, tumors or elevated intracranial pressure. The age of the patient as well as clinical findings suggests the type of diagnostic tests required to determine the probable etiology.^[1]

The 12 pairs of cranial nerves innervate most structures

of the head and neck. Their afferent and efferent connections traverse the meninges, subarachnoid space, bony structures of the cranium, and superficial soft tissues. Disruption of these nerves can occur at any site along their course, so that a large number of pathologic processes initially are manifested by cranial-nerve dysfunction.^[2]

Evaluating the patient with multiple cranial neuropathies presents a unique challenge for the diagnostician. The differential diagnosis is broad and includes many life-

threatening processes. A knowledge of the anatomy of the cranial nerves and their involvement in pathologic processes is therefore one of the corner stones of neurologic diagnosis. Just as with any other neurologic presentation, the first step in the evaluation requires correct localization. The purpose of study was to examine the seats and causes of multiple cranial neuropathies 50 patients who attended at tertiary care Hospital, Karimnagar.

MATERIALS AND METHODS

Study Design

The study was a cross sectional study conducted at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar between September 2016 to December 2018. Patients who required admission are admitted under Neurology Department.

Some of the patients with clear cut evidence of intracranial tumors had been referred to Neurosurgical Department and Pediatric patients were sent to the pediatric Department for further management under our guidance.

Study samplings: Total 50 patients with multiple cranial nerve palsies including in this study.

Inclusion Criteria

Patients with simultaneous or serial involvement of 2 or more different cranial nerves were included in the study.

Exclusion Criteria

- Patients with myasthenia gravis, motor neuron disease were excluded neither post papilledema optic atrophy, nor chiasmal damage was tallied as second-nerve involvement.
- Detailed history was taken with special emphasis on duration, mode of onset of illness, progression, any relevant past medical, surgical history was taken. Any constitutional symptoms were noted.
- Complete systemic and neurological examination was done with special emphasis on cranial nerve examination.

Diagnosis were based on extensive inpatient evaluation using routine blood investigations like CBP, ESR, Blood urea, serum creatinine, serum electrolytes in all patients.

CSF analysis was done in the required patients for cell count, biochemical analysis for sugars, proteins, ADA levels, gram stain and culture sensitivity were done. CSF cytology for malignant cells has been done on clinical basis.

Either CT or MRI brain images were done in patients on clinical basis. Contrast Imaging was done to patients if clinically indicated. MRA or CT angiography, MRS, MRI spine with or without contrast, USG abdomen, Chest X-ray, X-Ray or CT paranasal sinuses were done in some patients as clinically indicated.

Electrophysiological studies, biopsies, throat swab, CSF oligoclonal bands, SSS tests, blood culture were done in some cases as clinically indicated. Repeated investigations were done to patients as required. Probable diagnoses were favored over no diagnosis.

Ethical Approval

The study was reviewed and approved by Institute Ethics Committee, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar.

RESULTS

Multiple cranial nerve palsies are uncommon but not rare. Total 50 patients with multiple cranial neuropathy met the inclusion criteria, out of which 31(62%) were males and 19(38%) were females.

Table 3 : Modes of committing suicide

Age group in years	Male	Female	Total
0-10	0	2	2
11-20	2	3	5
21-30	7	4	11
31-40	3	1	4
41-50	5	2	7
51-60	4	7	11
61-70	8	0	8
71-80	2	0	2

Mean age of the patients was 42.65% years, ranging from 9 years to 74 years.

Table 2: Etiological classification of subgroup

Etiology	No.of patients
Vascular Disease	20
infection	10
Tumors	07
GBS plus Variants	04
Demyelination	03
Truama	03
Cavernous sinus syndrome	05
Miscellaneous	01

Vascular disease was responsible for 20 (40%) of the 50 cases. Out of 20 cases of vascular disease, acute stroke was responsible for 16 cases, Ischemic polyneuropathy was responsible for 3 cases, CSVT is responsible for one case. Youngest being 44 and oldest being 59.7 years.

Of the 16 cases of acute stroke, ischemic stroke is responsible for 14 cases and Hemorrhagic. Among 16 patients 5 patients have diabetes mellitus 9 patients have hypertension, 2 patients have both DM and HTN.

Among Ischemic polyneuropathy subgroup all 3 patients have DM and HTN. All three patients are male average age being is 69.3 years.

Table 3: Common Combinations of cranial nerves involved

Combinations of cranial nerves involved	No.of patients
II, VI	08
V, IX, X	06
V, VII, VIII	06
IX,X,VII	05
II,III,IV	04
VI,VII	03
IX,X	02
V,VI,VII	02
V,VII	02
II,VI,V	02

Table 3 shows the most common combinations of involved cranial nerves as a whole were IX , X cranial nerves(6+5+2=13), followed by III, VI cranial nerves (8cases), V, IX, X CNs (6cases), V, VII, VIII (6 cases), and IX, X, VII (5 cases) cranial nerves.

Table 4: Localization of Multiple Cranial Nerves Involved

Localization	No.of patients
Brain Stem	19
Sub arachnoid Space	07
Cavernous Sinus	07
Sellar Tumors	04
Nerve	05
CP angle	02
Intra Orbital	03
Petrous Apex	02
Unknown	03

In this study, vascular causes constitute most common cause of cranial neuropathy. As whole IX and Xth Cranial nerves are the most commonly involved combination. In some patients IX, X CN's are involved in combination with V CN and in some patients in combination with VIIth

CN. VIIth CN was implicated in GBS as well as in CP angle tumors. IIIrd CN was most commonly damaged in cavernous sinus syndrome, ischemic neuropathy and Tuberculous meningitis and Trauma. II and IV CN were involved most commonly in trauma. Vth CN was most commonly involved by vascular causes and cavernous sinus syndrome. No patient had involvement of all the cranial nerves.

DISCUSSION

In this present study, cranial nerves were more frequently associated with tuberculous meningitis (constituted about 4 out of 5 cases meningitis) than acute bacterial meningitis (case of Pneumococcal meningitis. The cranial nerve palsies was the most important neurological predictor factor to differentiate ICP with raised ICP with or without hydrocephalus with VI nerve palsy.

Multiple cranial nerve involvement, which is indicative of basilar meningitis, has been previously reported in patients with Streptococcus pneumonia Meningitis.^[4,5]

Out of 20 cases of vascular disease, 14 cases resulted from ischemic Stroke involving Brainstem, involving mainly lateral medulla and lateral pons. 2 cases resulted from Hemorrhagic stroke.

3 cases resulted from Ischemic cranial neuropathy 1 Case resulted from CSVT. Out of 14 cases of ischemic stroke 2 are resulted from vertebralartery Dissection.

Vascular disease being the most frequent cause in our study, in which Brainstem infarcts being the most common, the 2nd common cause is infections, followed by tumours. Whereas, in Keane's study group it was the tumours that was most common cause of multiple cranial palsy, followed by vascular disease, trauma, infections and GBS & MFS.^[6]

In our study, we had a patient, who presented with multiple cranial nerve palsies and hemiparesis, MRI Brain showed multiple T1 Hyper intense, T2, FLAIR hypo intensity lesions, and homogenously enhancing lesions on contrast.

As T1 hyper intense lesions differential diagnoses are few, and with multiple lesions involving brainstem and, B/l hemispheres, we suspected malignant melanoma metastases. On careful examination we found, cervical lymphadenopathy. We did biopsy, which confirmed malignant melanoma metastasis. We lost the follow up of that patient.

In this study showed that 4th and 2nd, 3rd cranial nerves are involved in all 3 cases, 6th cranial nerve in 2 cases. Most common combination being 2, 3, 4 cranial nerves. In follow up 3, 4, 6 cranial nerves recovered, but residual visual loss persisted.

CONCLUSION

Till now, literature on cranial neuropathy of multiple etiologies is very limited. Our study concluded that the majority of cases were vascular disease (40% cases), in which male patients are affected in 65% of cases and female patients are affected in 35%. Although many of the causes have specific therapies, the evaluation often leads to a dead end requiring individual clinical discretion to decide on the best possible empiric therapy.

CONFLICT OF INTEREST :

The authors declared no conflict of interest.

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