

STUDY ON PREVALENCE AND ETIOLOGY OF PERIPHERAL FACIAL NERVE PARALYSIS IN A TERTIARY CARE CENTER

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Abstract

Background: The pathways of the facial nerve are variable, and knowledge of the key infratemporal and extratemporal landmarks is essential for accurate physical diagnosis and safe and effective surgical intervention. Present study was aimed to study prevalence and etiology of peripheral facial nerve paralysis in a tertiary care center. **Material and Methods:** Present study was single-center, cross sectional study, conducted in patients of age 3-80 years, either gender had peripheral facial nerve paralysis or lower motor neuron facial weakness/asymmetry. **Results:** In present study, out of 40 patients 65% were male and 35% were female. Majority were from 20-64 years age group (80 %). Majority patients presented with deviation of mouth to contralateral side of facial palsy (52.5%) followed by hard of hearing on same side (20 %), ear discharge (17.5 %) and post-surgery (15 %). Common findings noted were patients had a normal tympanic membrane (52.5 %), granulation in EAC (12.5 %), edematous EAC (10 %), TM perforation (7.5 %) and purulent ear discharge (5 %). Majority presented with House Brackmann grading of 3/6 (27.5 %). In present study 60% of the patients tested positive for Schirmer test. Most common etiology noted in present study was Bell's Palsy (25%), COM (15 %) Malignant otitis externa (12.5 %), trauma (10 %) & post viral infections (7.5 %). In our study acoustic reflex was absent in 92.5 % of patients, 92.5 % of the patients had reduced taste sensation and it was found intact in only 7.5 % patients. In present study, common imaging modality was CT brain (40 %) followed by MRI Brain (37.5 %) & USG neck for confirming parotiditis (2.5%). 20% patients have been diagnosed clinically and required no imaging facilities. **Conclusion:** In peripheral facial nerve palsy has male preponderance with most common etiology being Bell's palsy.

INTRODUCTION

Face is the interpreter of emotions, mirror of soul, powerhouse of senses and way for communication. Facial nerve is the seventh cranial nerve which serves vital functions of lacrimation, salivation, taste, hearing and facial expression.^[1] A list of etiologies commonly Bell's palsy, followed by temporal bone fracture, iatrogenic trauma, herpes

zoster oticus, otitis media (OM), cerebellopontine (CP) angle or infratemporal neoplasm (facial nerve Schwannoma), result in facial nerve paralysis.^[2,3]

It necessitates urgent measures to understand the cause and nature of nerve injury and undertake immediate steps for restoration and rehabilitation of facial symmetry. The nerve testing depends on determining the scale of distal axonal degeneration (electrodiagnosis), function of branches of the

nerve (topodiagnosis) and radiologic guidance in indicated cases.^[4]

The pathways of the facial nerve are variable, and knowledge of the key infratemporal and extratemporal landmarks is essential for accurate physical diagnosis and safe and effective surgical intervention.^[5] Present study was aimed to study prevalence and etiology of peripheral facial nerve paralysis in a tertiary care center.

MATERIAL AND METHODS

Present study was single-center, cross sectional study, conducted in Department of ENT with department of General Medicine & Neurology, at PSG Institute Of Medical Sciences & Research, Coimbatore, India. Study duration was of 18 months (January 2020 – June 2021). Study approval was obtained from institutional ethical committee.

Inclusion criteria

- Patients of age 3-80 years, either gender had peripheral facial nerve paralysis or lower

motor neuron facial weakness/asymmetry, willing to participate in present study.

Exclusion criteria

- Infants
- Toddler up to age of 3 years
- Adults above 80 years.

Study was explained to patients in local language & written consent was taken for participation & study. After obtaining the patient information and filling it systematically, careful history was recorded regarding commencement, causation, duration and progression. Physical examination done, functions of facial nerve & ENT (Schirmer's test, acoustic reflex, subjective taste sensation tests, routine laboratory investigations and audiological evaluation) were evaluated.

Patients underwent comprehensive radiology evaluation by High-Resolution Computed Tomography (HRCT) brain and Magnetic Resonance Imaging (MRI) of brain if indicated. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULT

In present study, out of 40 patients 65% were male and 35% were female. Majority were from 20-64 years age group (80 %).

Table 1: General characteristics

Characteristics	No. of patients	Percentage
Age groups (in years)		
3-12	2	5%
13-19	3	8%
20-64	32	80%
65-80	3	8%
Gender		
Male	26	65%
Female	14	35%

Majority patients presented with deviation of mouth to contralateral side of facial palsy (52.5%) followed by hard of hearing on same side (20 %), ear discharge (17.5 %) and post-surgery (15 %). Majority presented between 3-6 days after the onset of symptoms. Common comorbidities were diabetes (42.5 %) & systemic hypertension (17.5 %).

Table 2: Clinical features

Clinical features	No. of patients	Percentage
Symptoms		
Deviation of mouth to contralateral side of facial palsy	21	52.5%
Hard of hearing	8	20%
Ear discharge	7	17.5%
Post surgery	6	15%
Ear pain	5	12.5%
Ipsilateral ear ringing sensation	5	12.5%
Trauma & ear bleeding	5	12.5%
Facial asymmetry	4	10%
Vertigo	3	7.5%
Skin lesions over face	2	5%
Comorbidities		
Diabetes	17	42.5%
Hypertension	7	17.5%
Coronary Artery Disease	1	2.5%
Cerebrovascular accident	1	2.5%

Post covid	1	2.5%
HIV , TB	2	5%
No comorbidities	11	27.5%

Common findings noted were patients had a normal tympanic membrane (52.5 %), granulation in EAC (12.5 %), edematous EAC (10 %), TM perforation (7.5 %) and purulent ear discharge (5 %). Majority presented with House Brackmann grading of 3/6 (27.5 %) followed by 4/6 (17.5 %), 6/6 (15 %) & 5/6 (10 %). 60% of the patients tested positive for Schirmer test at the time of presentation.

Table 3: Clinical Findings

Clinical Findings	No. of patients	Percentage
Ear clinical finding		
Normal	21	52.5%
Granulation in EAC	5	12.5%
Edematous eac	4	10%
TM perforation	3	7.5%
Hemotympanum	3	7.5%
Purulent discharge	2	5%
Reddish hue behind tm	2	5%
House brackman grading on day of presentation		
2/6	4	10 %
3/6	12	30 %
4/6	11	27.5 %
5/6	6	15 %
6/6	7	17.5 %
Schirmer test		
Positive	24	60 %
Negative	16	40 %

Most common etiology noted in present study was Bell's Palsy (25%), COM (15 %) Malignant otitis externa (12.5 %), trauma (10 %) & post viral infections (7.5 %).

Table 4: Etiology

Etiology	No. Of patients	Percentage
Bell's palsy	10	25%
COM	6	15%
Malignant otitis externa	5	12.5%
Trauma	4	10%
Post viral infections	3	7.5%
Glomus	3	7.5%
Atypical meningioma	1	2.5%
Acoustic neuroma	1	2.5%
Iatrogenic	2	5 %

In our study acoustic reflex was absent on 92.5 % of patients and preserved in only 7.5 % patients.

Table 5: Acoustic Reflex

Acoustic reflex	No. of patients	Percentage
Present	3	7.5%
Absent	37	92.5%

92.5% of the patients had reduced taste sensation and it was found intact in only 7.5% patients.

Table 6: Taste sensation

Taste sensation	No. of patients	Percentage
Intact	3	7.5%
Decreased	37	92.5%

In present study, common imaging modality was CT brain (40 %) followed by MRI Brain (37.5 %) & USG neck for confirming parotiditis (2.5%). 20% patients have been diagnosed clinically and required no imaging facilities.

Table 7: Imaging modalities

Imaging	No. Of patients	Percentage
MRI brain	15	37.5%

CT brain	16	40%
USG neck	1	2.5%
No imaging	8	20%

DISCUSSION

Over past two decades, many developments have been made. Newer technologies like radiology, electrodiagnostic study and emergence of intraoperative monitoring have been helpful.^[5,6] Complex course within the bony canal, congenital dehiscence, fine branching, interconnections, segmental blood supply, all these factors show significantly, heading towards causation and final result of insult to nerve.^[7] About 90% of lower motor neuron facial nerve disorders- inflammatory, traumatic or neoplastic, happens along its intratemporal course.

Venugopal *et al.*,^[5] found that trauma (41.7%) contributed to the major proportion of cases. It may be Iatrogenic (20%) or Non-Iatrogenic (21.7%). A large number of road traffic accidents constituted 21.7% cases of facial palsy were accounted for trauma (fracture of temporal bone) and Bell's palsy. Incidence of facial palsy secondary to Chronic otitis media is 67% of which one case was tuberculous otitis media. Cholesteatoma was the most common infective cause. Majority reported with House Brackmann grade III palsy (30%), followed by grade IV palsy (25%). Topodiagnostic tests showed Bell's palsy involving suprageniculate region (44.4%). Iatrogenic trauma was common in infrastapedial region. Temporal bone fractures had suprageniculate lesion. Similar findings were reported in present study.

Bharathi M *et al.*,^[8] studied 101 patients, of which 25.7% were in third decade of age; 55.4% were males, and both right and left sides of the face are involved equally. Most patients (50.5%) had a history of post aural pain at presentation. Topodiagnostic tests showed majority of Bell's palsy patients had geniculate or suprageniculate lesions (67.3%) in the study. 20.8% had lesion above the nerve to stapedius, and 11.9% had lesion below the nerve to stapedius. 50.4% of patients had a House-Brackmann (HB) facial nerve grade IV while they presented to study.

In our study most of the patients with facial nerve palsy at the time of presentation was found to have 3/6. Topodiagnostic tests among our study population showed 60% positive Schirmer's tests, absent acoustic reflex in 92.5 % patients, compromised taste sensation in 92.5% patients.

Manish Munjal *et al.*,^[9] studied 500 cases of head injury. 48 patients of facial palsy were taken. Taste sensation was decreased in 67% (21 cases); acoustic reflex was absent in 86.8% (33 cases) and Schirmer's test showed decreased lacrimation in 29.1% (14 cases).

At the end the study we found that, peripheral facial nerve palsy was associated with male preponderance, majority had deviation of mouth to contralateral side of facial palsy, presented after 3-6 days of onset of symptoms, majority had House Brackmann grade 3/6, common etiology being Bell's palsy. In present study, the site of lesion was localized with the help of topodiagnostic tests and imaging modalities (MRI/CT/USG).

Topodiagnostic tests are less reliable and limited correlation with precise site of nerve damage. Limitations of present study were no follow up or recovery of the patients & electrophysiologic tests for prognostication were not used.

CONCLUSION

In patients of peripheral facial nerve palsy, we noted preponderance of male patients (65%) and females (35%). The most common presenting complaint was deviation of mouth to contralateral side of facial palsy (52.5%). Among our study population 42.5% were found to be associated with diabetes mellitus. We found 30% of the study population presented with House Brackmann grade of 3/6. The most common cause of peripheral facial nerve palsy was found to be Bell's palsy (25%). Topodiagnostic tests among our study population showed 60% positive Schirmer's tests, absent acoustic reflex in 92.5% , compromised taste sensation in 92.5%. In our study we have considered MRI brain in 37.5% patients, CT brain in 40% of the patients for localization of the pathology.

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