Original Research Article

Clinical study on etiology and management of lower motor neuron type palsy of facial nerve at a tertiary care hospital, Ballari, Karnataka

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Abstract

Background: Facial Nerve Paralysis is a common clinical condition encountered by otorhinolaryngologist. Of all the cranial nerves, the facial nerve is most susceptible to injury. The nerve travels a complex course through the temporal bone in proximity to various structures which are frequently the site of disease. Much of the nerve's susceptibility to paralysis can be attributed to these anatomical factors. Patients who suffer from facial paralysis experience not only functional consequences, but also the psychological impact of a change in self image and impaired communication ability. Facial nerve paralysis occurs due to diverse etiology and affects persons of all age group. Most causes of paralysis lie within the temporal bone. Evaluation of these cases includes complete head and neck examination with special emphasis on otological workup. While many cases are managed conservatively a small but significant number will require surgical intervention. **Methods:** A descriptive study was conducted among 50 patients at Department of ENT, Vijaynagar Institute of Medical Sciences (VIMS), Ballari from September 2014 to February 2015, patients with lower motor neuron facial nerve palsy presenting to the hospital were included in the study. Patients were investigated and treated as per the cause and their facial nerve function after treatment was assessed. **Results:** Out of total 50 patients, LMN facial palsy was found more common in male than in female ratio 1.5:1 and more in the adult age group 20-40 years. Bell's palsy was more in 20-40 years age group with male to female ratio of 0.75:1. Familial and recurrent Bells palsy is a rare feature. 76% patients with Bells palsy had complete recovery with steroids while 77% of patients with trauma had complete recovery. 50% of cases with surgical trauma had complete recovery. All patients of CSOM with facial palsy had complete recovery. **Conclusion:** Most cases of Bell's palsy can be managed conservatively. Cases due to iatrogenic trauma and accidental injury require careful evaluation and early intervention in certain cases.

Key Words: Facial Paralysis, Chronic Suppurative Otitis Media, Bell's Palsy

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INTRODUCTION

Face serves to recognize an individual. The expression on the face conveys lot of messages regarding the person's mood and his thoughts. The role of facial nerve to mirror the human character and expression was first described by Bell in 1821.[1] Facial Nerve Paralysis is a common clinical condition encountered by otorhinolaryngologist. Of all the cranial nerves, the facial nerve is most susceptible to injury. The nerve travels a complex course through the temporal bone in proximity to various structures which are frequently the site of disease. Much of the nerve's susceptibility to paralysis can be attributed to these anatomical factors. Patients who suffer from facial paralysis experience not only functional consequences, but also the psychological impact of a change in self image and impaired communication ability.[1] Causes of Facial Nerve paralysis are numerous

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which can be congenital, trauma, neurological, infection, metabolic, neoplastic, toxic, autoimmune, iatrogenic and idiopathic. More than 40 different causes of facial paralysis are known, classified as idiopathic, traumatic, infections, neoplastic and metabolic. Of the various causes, 75% are usually due to Bell's palsy or secondary to trauma.[2] In facial paralysis history and physical examination provide more information than do lab tests. Diagnostic tests add information to what is already known, influence the choice of therapy and can improve clinical outcome.[3] Management of facial nerve dysfunction is individualized and may include observation, administration of pharmacological agents, surgical interventions, physical therapy and psychological counseling.[4] Surgical management of facial nerve disorders continues to be as controversial as it was in the days of Cawthorne and Ketter.[5] Hence the degree of recovery also varies as per the modality of treatment used. In this context, it seems essential to know the complete management of facial nerve paralysis in our practice to help patients with this disorder to fare well and improve our skill and knowledge in managing future cases. Hence the present study was aimed to study the various etiological factors causing lower motor neuron facial paralysis and to know the effect of different methods of treatment on the course of the disease and its outcome

MATERIALS AND METHODS

A clinical based prospective study was under taken among 50 patients of facial palsy in ENT department of Vijaynagar Institute of Medical Science Ballari, Karantaka. The study was conducted for a period of one and half years from September 2014 to February 2015. Among the patients attending ENT, Medicine, Surgery, Ophthalmology and Neurology department. In each of these cases, a detailed clinical history was elicited and physical examination was carried out as per the proforma of the study. Investigations like routine blood, urine examination, X ray studies were done in the hospital. In some relevant cases, further investigations were done like, CT scan and other specific tests were done depending on individual basis. After investigation the patient were treated medically or surgically as indicated. After informing the patient and obtaining prior written consent, the patient was subjected to surgery as and when indicated and conforming to well recognized and established modalities of treatment. Post treatment the assessment of deformity and degree of improvement will be assessed. Whatever the modality of treatment, the patients were followed up for a minimum period of three months when the improvement was again assessed

Inclusion criteria:

1. Patients of all the age groups and both the sexes presenting with lower motor neuron type facial palsy.
2. Cases of post-operative Facial paralysis and after road traffic accident.
3. Patients presenting with recurrent episodes of Facial palsy.
4. Chronic cases of Facial palsy.

Exclusion criteria:

1. Those patients who do not give consent are excluded from the study.
2. Those patients who do not come for regular follow up (lost to follow up).
3. All those cases after clinical examination and/or investigation diagnosed as upper motor neuron type facial palsy.

Data was entered in MS Excel sheet and were analyzed in the form of percentage and proportions whenever necessary

RESULTS

It was seen from Table 1 that the total 50 cases were included in our study as study subjects, among them 80% of patients were less than 40yrs of age and youngest patient being 4 yrs and eldest being 63 years. Out of 50 study subjects more than half were females (54%), with deviation of angle of mouth and inability to close the eyes as predominant clinical presentation followed by ear ache (42 %) and ear discharge (16%). It was observed from Table 2 that the most common causes of lower motor neuron type of facial nerve paralysis, among the 50 study subjects 40% were due to Bell's palsy, upto 30% were due to accidental truma leading to temporal bone fracture. As Table 3 shows that the patients with Bell's palsy more than 60% belonged to less than 30 years age group. Most common symptom in patients with Bell's palsy was pain in the ear 15(71%) followed by viral prodrome 08(38%). All the patients with Bell's palsy were treated with prednisolone (1 mg/kg/day for 7 days initially) and methyl cobalamine. Other supportive measures were used which includes physiotherapy and psychological support. At the end of 2nd week, 4 patients had complete recovery and 3 patients showed signs of recovery. At the end of 6 weeks, 16 patients (76%) had complete recovery of facial function and remaining 5 patients (23%) had partial recovery. In our study, 13(26%) were due to accidental trauma, longitudinal fracture of temporal bone (69.3%) was more common which showed complete recovery on conservative managment followed by transvers fracture (23.3%), almost all were male patients except one female, 8 cases showed immediate signs of paralysis and 5 cases developed delayed paralysis.Associated ear bleeding was seen in all cases of longitudinal fracture. CSF otorrhoea

was seen in one case. Sensorineural hearing loss of severe degree was seen in 2 cases of transeverse fracture and 2 cases of longitudinal fracture (As shown in Table 4 and 5).

Table 1: Clinical presentation and causes of LMN type of facial nerve paralysis

Variable	No of cases (n=50)	Percentage
Age group (in yrs)		
0-10 yrs	03	7.3
11-20 yrs	11	22.1
21-30 yrs	18	35.5
31-40 yrs	08	15.9
41-50 yrs	05	10.1
51- 60 yrs	04	8.0
Above 60 yrs	01	2.0
Gender		
Male	23	46.0
Female	27	54.0
Signs and Symptoms		
Deviation of angle of mouth	50	100
Inability to close the eyes	50	100
Ear ache	21	42.0
Decreased hearing	08	16.0
Ear discharge	04	8.0
Vesicles	03	6.0

Table 2: Common causes of LMN type facial nerve paralysis

Causes	Frequency (n=50)	Percentage
Bell's palsy	21	42.0
Accidental trauma	13	26.0
CSOM	04	8.0
Iatrogenic injuries	06	12.0
ASOM	03	6.0
Herpes Zoster	03	6.0

Table 3: Clinical profile and out come of facial nerve paralysis due to Bell's palsy

Variable	No. of cases	Percentage
Age group (in yrs)		
0-10 yrs	01	4.7
11-20 yrs	05	23.8
21-30 yrs	07	33.3
31-40 yrs	04	19.0
41-50 yrs	02	9.5
51 and above	02	9.5
Gender		
Female	08	38.1
Male	13	61.9
Signs and Symptoms		
Pain in the ear	15	71.4
Viral fever	08	38.1
Hyperacusis	03	14.2
Decreased hearing	02	9.5
Recurrent palsy	02	9.5
Alteration in taste	01	4.7
Disease Outcome		
Complete recovery	16	76.2
Partial recovery	05	23.8
No recovery	00	00

Table 4: Facial paralysis due to accidental trauma

Variable	No. of Cases	Percentage	Grade of facial paralysis
Type of injury			
Longitudinal fracture of temporal bone	09	69.3	IV/V
Transverse fracture of temporal bone	03	23.2	IV
Extratemporal injury	01	7.5	IV
Gender			
Male	12	92.3	--
Female	01	7.7	--
Presentation of facial paralysis			
Immediate	08	61.5	--
Delayed	05	38.5	--

Table 5: Type of management and outcome of facial paralysis due to accidental injury

Type of injury	No. of cases	Type of management	Complete recovery	Partial recovery	No recovery
Longitudinal fracture of temporal bone	09	Conservative	08	01	---
Transverse fracture of temporal bone	03	Conservative	02	--	01
Extratemporal injury	01	---	---	---	01

DISCUSSION

Facial nerve is the seventh cranial nerve and is the nerve of facial expression. Due to the long and complicated course of the nerve through the temporal bone it is prone to damage from various causes. Among the various causes idiopathic facial nerve palsy or Bell's palsy is the most common cause. Bell's palsy is more common in adult males and so is traumatic facial palsy. Trauma is the other common cause. Diagnosis of facial nerve disorders can usually be made by a good clinical history, clinical examination supplemented by radiological investigations. Electrophysiological tests are important in prognosis and can give a idea about the optimal time for surgery. Among the 50 cases of facial palsy seen in our study the most common cause of facial palsy seen was Bell's palsy with 21 cases (42%). The second most common cause was trauma with 19 cases (38%). Other causes were paralysis secondary to CSOM 4 cases (8%), paralysis secondary to ASOM 3 cases (6%). Only three cases (6%) of facial palsy due to Herpes zoster was seen and similar results were found in a study by Mark.M *et al*.[6]

Bell's palsy -

Facial nerve paralysis due to Bell's palsy is the commonest cause in our study, 21 cases (42%). The majority of Bell's palsy patients in the present study was in the age group of 20-40 years (52.34%). The youngest was 10 years old and the oldest was 6 3years. Both Shambaugh[4] and May (1962)[7] in their studies also quote a peak incidence of Bell's palsy between 21 and 40 years of age although they say Bell's palsy can occur at any age .The sex incidence of Bell's palsy in the present series has a ratio of 0.75:1. In two separate series by Adour *et al*[8] and by Pietersen[9] the sex ratio was shown to be 1:1. The relative discrepancy in the ratio of our study is probably due to the large number of patients in the other studies (446 in Adour *et al* study and 1000 patients in Pietersens study) compared to our study. In a study of 446 patients of Bell's palsy by Adour *et al*[8], the most common symptom was pain (62%) This was also seen in the present study. Hyperacussis was more common than in our study, while viral prodrome was less common. No familial predisposition was seen in our study although it was seen in less than 10% of cases in their study. Recurrent palsy was also seen in less than 10% cases in both our study and the study by Adour *et al*[8]. Loss of taste was less common in our study compared to the study by Adour *et al* (57%). Out of 21 cases of Bell's palsy, the majority of cases of, that is 16 cases (76%) had complete recovery with medical line of treatment with steroids and physiotherapy at the end of 3 months. Remaining 5 cases had partial recovery (23%). Adour *et al*[8] in his study of 247 patients who were treated with medical line of treatment, showed that there was complete recovery in 90% of patients and 10% had incomplete recovery. Pietersen studied the natural history of Bell's palsy in 1000 patients over a period of 15 years. In his study, 84% showed complete recovery and only 4% out of the remaining 16% had poor recovery.[9]

Head injury-

Among the head injury patients, all the cases were due to road traffic accidents, which is the most common cause of traumatic facial palsy and 8 out of the 13 cases had immediate onset facial palsy and the remaining had late onset facial palsy. 12 out of the 13 patients gave a history of ear bleed and examination revealed blood clots within the ear canal. One patient gave no history of ear bleed. Hemotympanum was seen in 3 cases. 1 case had CSF otorrhoea. In a study done by Cannon and Jabrsdoefer[10] involving 90 patients of temporal bone fracture common physical findings were hemotympanum - 46 ears, ear bleed in 27 ears, CSF otorrhoea in 13 ears. All patients

with immediate onset facial palsy were advised a CT scan of the temporal bone. Out of this 12 patients had evidence of fracture, 9 were cases of longitudinal fracture (69.23%), 3 patients had transverse fracture (23.07%) and one was a case extratemporal facial nerve injury (7.69%). Hemanth Chopra[11] in his study of 48 cases of facial paralysis found that the incidence of longitudinal fracture was 51% and transverse fracture was 19%. This is comparable with our results of study.

Facial Paralysis due to CSOM -

In the present study, there were 4 cases (8%) of facial palsy due to CSOM. All the 4 cases had cholesteatoma. All cases were treated with modified radical mastoidectomy and decompression of the nerve was done. All patients had complete recovery of the nerve function after surgery. In a study by Aluntas[12], involving 1188 patients with CSOM, 20 patients had facial paralysis. Of these 20 cases, 14(70%) had Cholesteatoma. In a study by Savic and Djemic[13], involving 64 patients of facial paralysis due to CSOM, all underwent modified radical mastoidectomy with facial nerve exploration. 70% patients had complete recovery of facial function.

Herpes zoster -

In our study, 3 patients out of 50 (6%) had features of herpes zoster with facial palsy All three patients had vesicles around the ear and the angle of the jaw. The external auditory canal also had vesicles. They also complained of severe pain over the affected areas. These patients were treated medically with acyclovir, analgesics, steroids, methyl cobalamine and physiotherapy. One patient had complete recovery with treatment by 8 weeks, remaining two had partial recovery. In a study by Mark may and kelin[14], incidence of herpes zoster was 7%, similar to our study.

CONCLUSION

In the present study consisting of lower motor neuron facial nerve paralysis, the most common age group was found to be 20-40 yrs and clinical presentation was deviation in angle of mouth associated with unable of closure of eyes. Bell's palsy and trauma were found to be commonest eitiological factors, which show upto 90 percent recovery with adequate conservative and surgical management.

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