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Original Research Article

Incidence and management of Bell's palsy in peripheral facial paralysis cases

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ABSTRACT

Background: The underlying pathophysiology observed in cases of Bell's palsy is vascular distension, inflammation and oedema with ischaemia of the facial nerve. Various causes have been proposed including viral, inflammatory, autoimmune and vascular. The aim of this study was to evaluate the incidence and clinical presentation of Bell's palsy among North Indian patients.
Methods: A randomized prospective observational study was carried out in the department of otorhinolaryngology and head neck surgery, CHC, Chenani, Udhampur, on 60 patients, who presented with facial nerve palsy over a period of one year from August 2019 to July 2020. Patients were evaluated using the House-Brackman scale (HBS) and studied in relation to incidence, associated symptoms, percentage of recovery and effect of treatment on the rate of recurrence.
Results: Of the 60 patients of facial nerve palsy, 44 patients were diagnosed of Bell's palsy. 16 (37.5%) patients were grade II, 9 (14.6%) were grade III, 11 (31.3%) were grade IV, 7 (14.6%) were grade V and 1 (2.0%) patient was grade VI at onset. 21 (47.73%) patients had postauricular pain and 7 (15.90%) had hearing changes (phonophobia) during the attack. 35 (79.54%) patients recovered normal, while 9 (20.46%) patients did not return to normal life till the end of the follow up period. Out of the total 84.09% patients recovered, recurrence was also very low at 4.54%.
Conclusions: A significant number of patients recovered fully from the condition; however, eye protection remains crucial in preventing long-term eye complications.

Keywords: Antiviral drugs, Bell's palsy, Corticosteroids

INTRODUCTION

The most commonly known cause of acute onset unilateral peripheral facial weakness is Bell's palsy. Bell's palsy, also called idiopathic facial paralysis, is an isolated, unilateral, lower motor neurone facial weakness. Reported annual incidence varies in different parts of the world varies between 11 to 40 per 100 000 people.[1] The incidence of Bell's palsy is 20-30 cases for 100,000 in India and almost accounts for 70% of all cases of unilateral peripheral facial palsy.[2,3]

Historically, facial nerve paralysis has been known since ancient times by the Egyptians, Greeks or Romans.[4] Avicenna was the first to record the differences between central and peripheral facial paralysis. However, the name of Sir Charles Bell, who published his findings in 1821, is usually associated with this condition.[5]

The underlying pathophysiology observed in postmortem cases of Bell's palsy is vascular distension, inflammation and oedema with ischaemia of the facial nerve. Various causes have been proposed including viral, inflammatory,

autoimmune and vascular.[6] Despite advances in neuroimaging, the diagnosis of Bell's palsy is mainly clinical.[7] Most patients recover completely, but about 15-30% are reported to be left with different degrees of sequelae and patients do not look for treatment as the condition is painless and frequently limited or of short duration.[8-10] Complications of Bell's palsy include ocular problems, motor synkinesis (involuntary movement of muscles occurring at the same time as deliberate movement, like involuntary mouth movement during voluntary eye closure), crocodile tears (tears when eating due to misdirection of regenerating gustatory fibres), contracture of facial muscles and reduction or loss of taste sensation. The severity of symptoms of Bell's palsy varies from mild weakness to severe paralysis.

The palsy is known to recurs in 7% of patients, with equal incidence of ipsilateral and contralateral recurrence. There are insufficient data on whether treatment affects the rate of recurrence. Not many studies are there on the epidemiology and management of Bell's palsy in India. Therefore, the aim of this study was to evaluate the clinical aspects of Bell's palsy among North Indian patients and use the House-Brackman grading system, for facial nerve grading system.[11] Primary objective of the study was to study the incidence and clinical presentation of Bell's palsy among study population. And the secondary objectives were to determine incidence of ipsilateral and contralateral recurrence, the grade of the attack at onset, identity associated symptoms, to identify the percentage of recovery and effect of treatment on the rate of recurrence.

METHODS

A randomized prospective observational study was carried out in the department of otorhinolaryngology and head neck surgery, CHC, Chenani, Udhampur, on 60 patients, who presented with facial nerve palsy over a period of one year from August 2019 to July 2020.

Patients were evaluated using the Hous-Brackman scale during presentation and during recovery in addition to questionnaire and studied in relation to incidence and clinical presentation of Bell's palsy, grade of the attack at onset, associated symptoms, percentage of recovery and effect of treatment on the rate of recurrence (Table 1).

Inclusion criteria

Patients attending the OPD of department of otorhinolaryngology and head neck surgery, CHC, Chenani, Udhampur and presenting with the symptoms of facial nerve palsy were included.

Exclusion criteria

Known traumatic, inflammatory and neoplastic pathology of the facial nerve in its intra- or extracranial course bilateral facial paralysis concurrent disease of the central or peripheral nervous system were excluded.

Table 1: HBS and Yanagihara grading system (Y-system) to grade severity of facial nerve palsy by assessing motility of forehead, eye, nose and mouth as 1-6.[12]

Grades	HBS	Y-system
Normal, symmetrical function in all areas	I	40
Slight weakness on close inspection, complete eye closure with minimal effort, slight asymmetry of smile with maximal eVort, slight synkinesis, absent contracture or spasm	II	32-38
Obvious weakness but not disfiguring, unable to lift eyebrow, complete and strong eye closure, asymmetrical mouth movement with maximal eVort, obvious but not disWguring synkinesis, mass movement or spasm	III	24-30
Obvious disfiguring weakness, inability to lift brow, incomplete eye closure, and asymmetry of mouth with maximal eVort, severe synkinesis, mass movement, spasms	IV	16-22
Motion barely perceptible, incomplete eye closure, slight movement corner mouth, synkinesis, contracture, spasm usually absent	V	8-4
No movement, loss of tone, no synkinesis, contracture, spasm	VI	0-6

Based on prior studies who had observed Bell's palsy in 60-70% of patients with peripheral facial nerve paralysis and considering the power of study at 80%, margin of error: 5%, minimum sample size came out to be: 48, which was taken as 60 for the betterment of the study.[3] The data were analysed using MS excel 2010 software.

Ethical clearance was duly obtained from the institutional ethical committee.

Clinical features of Bell's palsy were weakness or paralysis of the upper and lower facial muscles of the affected side; drooping of ipsilateral eyelids, inability to close the eye completely; dry eye due to inability to close eyes completely, excessive tearing of the eye (epiphora), drooping of the corner of the mouth; ipsilateral impaired/loss of taste sensation; difficulty with eating due to ipsilateral muscle weakness causing food to be trapped on the affected side of the mouth; dribbling of saliva; altered sensation on the affected side of the face; pain in or behind the ear; increased sensitivity to sound

(hyperacusis) on affected side if stapedius muscle was involved.

RESULTS

Of the 60 patients of facial nerve palsy studied during the period, 44 patients were diagnosed of Bell's palsy. Of these 44 patients, 16 (37.5%) patients were grade II at onset, 9 (14.6%) patients were grade III at onset, 11 (31.3%) patients were grade IV at onset, 7 (14.6%) patients were grade V at onset and 1 (2.0%) patient was grade VI at onset (Figure 1).

Table 2: Associated symptoms with Bell's palsy.

Associated symptoms	Frequency	Percentage
Post-auricular pain	21	47.73
No post-auricular pain	23	52.27
Total	44	100
Phonophobia	7	15.90
No phonophobia	37	84.10
Total	44	100

Table 3: Recovery among Bell's palsy patients with postauricular pain.

Recovery	Frequency	Percentage
Complete recovery	19	90.48
Incomplete recovery	2	9.52
Total	21	100

Table 4: Recovery among Bell's palsy patients.

Recovery	Frequency	Percentage
Complete recovery	35	79.54
Incomplete recovery	9	20.46
Total	44	100

Of the 44 patients with Bell's palsy, 21 (47.73%) patients had postauricular pain before and during the attack and 23 (52.27%) patients did not complain of postauricular pain before or during the attack. Of the 44 patients with Bell's palsy, 7 (15.90%) had hearing changes (phonophobia) during the attack, while 37 (84.10%) did not complain of hearing changes (Table 2).

Table 5: Effect of treatment on the rate of recovery and recurrence.

Grades	Initial no. of patients	Recovery after follow up	Recurrence within the follow up period
		N (%)	N (%)
Within grade II	16	14 (87.50)*	1(6.25)
Within grade III	9	7 (77.78)*	0 (0)
Within grade IV	11	9 (81.82)*	1 (9.09)
Within grade V	7	6 (85.71)*	0 (0)
Within grade VI	1	1 (100)*	0 (0)
Total	44	37 (84.09)*	2 (4.54)

*p value <0.001, therefore the data findings are significant.

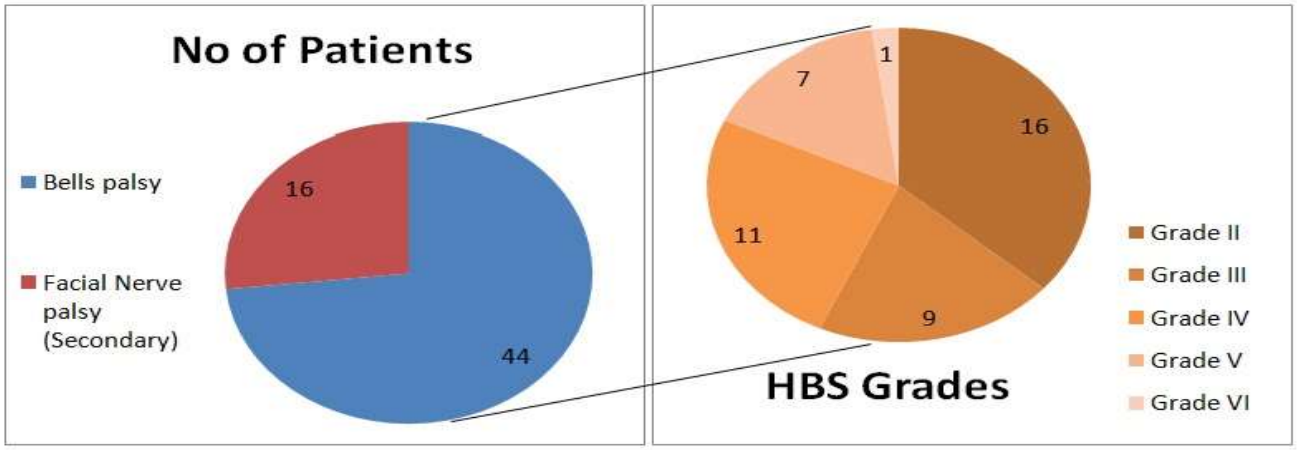

Figure 1: Patients diagnosed of Bell's palsy.

Of the 44 patients with Bell's palsy, 35 (79.54%) patients recovered normal, while 9 (20.46%) patients did not return to normal life till the end of the follow up period. Out of the total 84.09% patients recovered, recurrence was also very low at 4.54% (Table 3-5).

The frequency of recovery depended on the individual patient and the severity of their symptoms. If there was no improvement after a period of 3 months, the patient was referred.

DISCUSSION

Bell's palsy is the most common cause of acute unilateral facial paralysis, accounting for approximately 60-75% of such cases. Bilateral facial paralysis can also occur, whose occurrence rate was less than 1%. Bell's palsy can also be recurrent in 4-14% of affected individuals. The condition was more characteristic for winter season, largely because lower temperatures were associated with an overall higher risk.

Either gender was affected equally and may occur at any age, but the condition was generally more common in adults, with the median age being 40 years. A somewhat higher prevalence rate was found in people older than 65 years of age. The incidence was lowest under 10 years of age and highest in people over the age of 70. Left and right sides were affected equally.[10] Pregnancy can increase the risk threefold and in pregnant women Bell's palsy most commonly appeared in the third trimester. Preeclampsia (disorder of pregnancy manifesting with high blood pressure and proteins in the urine) was also shown to increase the risk. Diabetes and prediabetes were conditions frequently associated with Bell's palsy. The risk of being affected by this condition was 29% higher in diabetic patients than in healthy individuals. Impaired glucose tolerance and insulin resistance were also significantly more common in patients with Bell's palsy, thus an early stage of diabetes can occasionally be detected upon the onset of this condition. Patients with hypothyroidism and other autoimmune processes of the thyroid gland also represented a susceptible group.

There was an increased risk of corneal complications due to the inability to close the eye on the affected side, thus, eye protection was crucial. Eye drops such as hypromellose drops, should be applied for lubrication during the day and ointment at night. In severe cases, the eye may have to be taped or partially sutured shut. It was known that inflammation and oedema of the facial nerve were responsible for the symptoms arising out of Bell's palsy; therefore, oral corticosteroids (prednisolone) as anti-inflammatory and other antiviral drugs were generally considered treatments. The maximum benefit was seen when steroids were commenced within 72 hours of the onset of symptoms.

In a randomised controlled trial the recovery rate at nine months with prednisolone was 94%. It was 81.6% in patients who did not receive prednisolone.[13] Another randomized controlled trial found that at nine months of diagnosis, facial function had recovered in 94.4% of patients who took prednisolone alone, 85.4% of those who took aciclovir alone and 92.7% of those who received both. Similarly in our study, there was complete recovery in 90.48% patients from postauricular pain.

There were indications that the facial nerve was subclinically involved in 6% of the patients with diabetes.[14] Facial nerve affection, however, was less frequent than limb nerve affection. In a series of 126 patients with Bell's palsy chemical or overt diabetes was found in 39% of the cases. In this study, impairment of taste was found in 83% of the patients without diabetes as compared to only 14% in diabetic patients. These findings suggested that the lesion in diabetic facial nerve palsy was distal to the chorda tympany but proximal to it and more severe in non-diabetic patients with Bell's palsy that some cases of Bell's palsy with normal taste may in fact represent diabetic mononeuropathy.[15] In another study the rate of diabetes was 10% among 38 outpatients with Bell's palsy.

It was not easy to apply the HBS on our patients and difficult to distinguish between grade IV and grade V onset. However, patients who presented with a clear grade II and III at onset accounted for 36.36% and 20.45% of the cases, respectively, while patients who presented with a grade IV onset accounted for 25.00% of the cases. Pietersen using his grading scale (Pietersen grading scale), found that 12% of his patients were grade II (slight paralysis) on presentation and 13% were grade III (moderate paralysis on presentation) and only 4% were grade IV and V (moderately severe and severe).[9]

In a randomised controlled trial the recovery rate at nine months with prednisolone was 94%. It was 81.6% in patients who did not receive prednisolone.[14] However, in the current study, of the 44 patients with Bell's palsy, 35 (79.54%) patients recovered normal, while 9 (20.46%) patients did not return to normal life till the end of the follow up period. This may be due to the delay in administration of corticosteroids. It was seen that the maximum benefit, in case of such conditions, was seen when steroids were commenced within 72 hours of the onset of symptoms. There was no optimum regimen, but in adults 50-60 mg prednisolone daily for 10 days had been commonly used.[9]

A randomised controlled trial found that at nine months of diagnosis, facial function had recovered in 94.4% of patients who took prednisolone alone, 85.4% of those who took aciclovir alone and 92.7% of those who received both. There were no serious adverse effects in any group. The study concluded that early treatment with prednisolone alone increased the likelihood of complete recovery and there was no additional benefit of treatment with aciclovir alone or combining with prednisolone.[14] However, a systematic review also found that treatment with prednisolone reduced the chances of incomplete recovery but using an antiviral drug had an additional benefit.[16]

Most of our patients complained of postauricular pain before and during the attack of Bell's palsy. In his study, Pietersen found 52% of his patients suffering from postauricular pain and concluded that patients with postauricular pains have a significantly worse prognosis than those without pains.[9] Katusic et al studied the different prognostic factors and found pains other than that of the ear which had a significant relationship with incomplete recovery.[10]

Around 15.9% of our patients suffered from phonophobia during the attack, while 31.8% of our patients had increased tearing during the attack (due to loss of function of musculus oribcularis oculi). Similar observation was reported by Pietersen mounting up to 67% of his patients.[9] Following treatment, 79.54% of the Bell's palsy patients in this study regained normal function during the follow up period. Patients with grades II and III showed 87.50% and 77.78% recovery during the follow up period of 3-9 months. Patients with grade IV at onset showed 81.82% recovery and patients with grade V showed 85.71%, while 100% patients with grade VI paralysis showed complete recovery during the study period. The percentage of complete recovery did not decrease with increased severity of the attack at onset, which could possibly due to the small sample size taken.

Engstrom et al concluded that patients with a high degree of nerve degeneration at both the initial examination and the first follow up have a poorer prognosis.[17] Gordana et al found that an incomplete paralysis at the onset can have complete recovery at the end, while when there was complete paralysis at the onset, the end result after the follow up period was disappointing, showing a degree of permanent paralysis.[18] A Cochrane review in 2015 found that antivirals combined with corticosteroids improved rates of incomplete recovery compared with corticosteroids alone, but this was not significant and the evidence was low quality. There was moderate-quality evidence that the combination reduced long-term sequelae such as excessive tear production and synkinesis. The outcome for patients who received corticosteroids alone was significantly better than for those who received antivirals alone. Antiviral drugs alone had no benefit over placebo. None of the treatments had significant differences in adverse effects, but the evidence was again of low quality.[19]

At the same time, physical therapies including tailored facial exercises, acupuncture to affected muscles, massage, thermotherapy and electrical stimulation had been used to hasten recovery. However, there was no evidence for any significant benefit. A Cochrane review concluded from poor-quality evidence that tailored facial exercises can help improve facial function, mainly for moderate paralysis and chronic cases. Early facial exercise may reduce recovery time, long-term paralysis and number of chronic cases.[20]

CONCLUSION

We failed to demonstrate any relation between recoveries with increased severity of the attack at onset, however a significant number of patients recovered fully from the condition. In the present study, we found the sample size to be small, with a limited period of follow up, therefore, we need a large population-based study, with a larger follow up time period to analyze the real consequence of such studies. However, eye protection remains crucial in preventing long-term eye complications from Bell's palsy and for that matter, from peripheral facial palsy. And, there may be some benefit in adding antiviral drugs to prednisolone in the treatment procedures.

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