Outcome of Patients Presenting with Idiopathic Facial Nerve Paralysis (Bell's Palsy) in a Tertiary Centre – A Five Year Experience

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SUMMARY

This is a retrospective study. The objective of this study is to review the factors influencing the outcome of treatment for the patients presented with idiopathic facial nerve paralysis. The demographic data, clinical presentation and management of 84 patients with idiopathic facial nerve paralysis (Bell's palsy) were collected from the medical record office, reviewed and analyzed from 2000 to 2005. Thirty-four (72.3%) out of 47 patients who were treated with oral prednisolone alone, fully recovered from Bell's palsy meanwhile 36(97%) out of 37 patients who were treated with combination of oral prednisolone and acyclovir fully recovered. The difference was statistically significant. 42 (93.3%) out of 45 patients who presented within three days to our clinic, fully recovered while 28 (71.8%) out of 39 patients presented later then three days had full recovery from Bell's palsy. The difference was statistically significant. The outcome of full recovery is better with the patients treated with combined acyclovir and prednisolone compared with prednisolone alone. The patients who were treated after three days of clinical presentation, who were more than 50 years of age, who had concurrent chronic medical illness and facial nerve paralysis HB Grade IV to VI during initial presentation have reduced chance of full recovery of facial nerve paralysis.

KEY WORDS:
Bell's palsy, Idiopathic facial nerve paralysis, Outcome

INTRODUCTION

Sir Charles Bell was the first to describe unilateral facial nerve dysfunction in 1830[1]. The incidence is estimated 20 to 30 per 100,000[2]. Bell's palsy also known as idiopathic facial nerve paralysis results in facial motor dysfunction with different severity. The definite etiologic agents are not confirmed but theories on viral etiology have been proposed and are still under investigations[3,4]. Clinical presentations are based on the amount of neural injury. Many grading schemes have been proposed to quantify the extent of facial weakness however, none is universal. Facial Nerve Disorders Committee of the American Academy of Otolaryngology has endorsed the House-Brackmann grading scale (HBGS) as a standard method of describing facial nerve dysfunction in 1984[5]. The treatment of Bell's palsy includes medical treatment which combines steroid with acyclovir and surgical intervention to decompress the facial nerve. The majority of patients recover, but a significant minority, up to 16 percent, demonstrates moderate or severe sequelae[6].

In this study, we evaluate a group of patients with idiopathic facial nerve paralysis. Our aim was to review the factors influencing outcome of treatment for the patients presented with idiopathic facial nerve paralysis.

MATERIALS AND METHODS

This is a retrospective review of 84 patients' records with idiopathic facial nerve paralysis (Bell's palsy) who had attended Otorhinolaryngology (ORL) clinic at our centre from 2000 to 2005. The demographic data, clinical presentation and management of these patients were collected from the medical record office and reviewed.

The severity of idiopathic facial nerve paralysis is graded based on House-Brackmann Grading Scale (HBGS)[7] (Table I). This grading system is formally adopted as the universal standard reporting facial nerve dysfunction after recommendation by Facial Nerve Disorders Committee of the American Academy of Otolaryngology-Head and Neck Surgery in 1984[5].

The factors are analyzed statistically for their role in affecting the outcome of treatment of idiopathic facial nerve paralysis by using a chi-square test of significance and odd ratio in general loglinear analysis to estimate the likelihood of association.

RESULTS

Eighty-four patients were diagnosed to have idiopathic facial nerve paralysis (Bell's palsy) at our centre from 2000 to 2005. The average age at diagnosis was 35 years with a range from three years to 77 years. Forty-six (54.8%) patients were male and 38 (45.2%) patients were female. Forty-one (48.7%) patients had right sided facial nerve paralysis and 43(51.2%) patients had left sided facial nerve paralysis. Thirty-five out of 84 patients were of Malay ethnicity, 16 patients were of Chinese decent and 30 patients were of Indian decent. All of them presented with different degree of sudden onset of unilateral facial weakness. Other symptoms included epiphora (30%), hyperacusis (20.2%), postauricular pain

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(11.9%) and ageusia (7.2%). The patients presented to Otorhinolaryngology clinic (ORL) within one to 60 days with the average of five days from the day they noticed the first symptom. Forty-five (53.6%) patients presented within the first three days from the first noticed symptom. Thirteen (15.5%) out of the 84 patients had associated chronic medical illness. Eight of them had diabetes mellitus, seven patients had hypertension and one had ischemic heart disease (Table II).

All the patients were graded based on House-Brackmann Grading Scale 7 during initial presentation at the ORL clinic. Sixteen (19%) patients had HB Grade II, 43 (51.2%) patients Grade III, 22 (26.2%) patients Grade IV, two (2.4%) patients Grade V and one (1.2%) patient Grade VI facial nerve paralysis when they first seen at ORL clinic (Figure I). All the patients were diagnosed to have idiopathic facial nerve paralysis (Bell's palsy) after excluding the possible causes of facial nerve paralysis clinically.

Forty-seven (56%) of the 84 patients were treated with steroid alone meanwhile 37(44%) of the 84 patients were treated with a combination of steroid and acyclovir. The dosage for acyclovir was 2000mg/day in divided doses for five days and prednisolone was 1mg/kg for first seven days and then tapering down within the next two weeks (Figure II).

After six to twelve months follow-up, 70 (83.3%) patients fully recovered, 13 (15.4%) patients partial recovered and one (1.2%) patient did not response to treatment. In the group that totally recovered, 16 patients were from HB Grade II, 34 patients were from HB Grade III, 19 patients were from HB Grade IV and one patient was from HB Grade V (Table III).

Thirty-four (72.3%) out of 47 patients who were treated with oral prednisolone alone fully recovered from Bell's palsy meanwhile 36 (97%) out of 37 patients who were treated with combination of oral prednisolone and acyclovir fully recovered after six to twelve months follow-up. The difference was statistically significant with p value of 0.002 (Pearson Chi-square test).

Fifty-nine (85.5%) out of 69 patients who were below 50 years of age recovered fully from Bell's palsy after six to twelve months follow-up. On the other hand, 11 (73.3%) out of 15 patients who were above 50 years old fully recovered from Bell's palsy after six to twelve months follow-up. The likelihood of full recovery from Bell's palsy decreased with increasing age with the odd ratio of 0.5. However, the difference was not statistically significant (P>0.05).

Thirty-nine (84.8%) out of 46 male patients and 31 (81.6%) out of 38 female patients fully recovered from Bell's palsy accordingly. The difference was not statistically significant with p value more than 0.05.

There was no correlation between the laterality of facial nerve palsy with total recovery of facial nerve palsy.

Forty-two (93.3%) out of 45 patients who presented within three days to the clinic fully recovered while 28 (71.8%) out of 39 patients presented later then three days had fully recovered from Bell's palsy. The difference was statistically significant with p value of 0.008.

Eight (61.5%) out of 13 patients with associated chronic medical illness e.g. Diabetes mellitus, hypertension fully recovered. On the other hand, 60 (84.5%) out of 71 patients without any significant co morbid diseases fully recovered. There was likelihood of reduced chance of full recovery when associated with chronic medical illness with odd ratio of 0.3. However, the difference was not statistically significant.

Fifty (85%) out of 59 patients with HB Grade II and III facial nerve paralysis fully recovered while 20 (80%) out of 25 patients with HB Grade IV to VI fully recovered. Patients with HB Grade II and III facial nerve paralysis had a better chance of full recovery compared to patients with HB Grade IV and VI with the odd ratio of 1.4. However, the difference was not statistically significant.

DISCUSSION

Bell's palsy is an idiopathic neuropathy affecting the facial nerve. The most readily apparent symptom of Bell's palsy is hemifacial paresis or paralysis. Patients afflicted with idiopathic facial nerve palsy have variable recovery dependent on the degree of motor dysfunction. The literature clearly shows that virtually all patients with clinically incomplete paralysis that remains incomplete have excellent recovery of facial function independent of the treatment[8]. Bell's palsy can be treated medically or surgically. However up to now, there still has been major disagreement with regard to the treatment.

The age and sex distribution in this study were comparable with the study done by Sittel C *et al*[9] in 2000. The ethnic grouping is not representative of the national ethnic population distribution most likely due to certain majority of the ethnic groups who are residing near the hospital. All the patients in our study noted sudden onset of hemifacial weakness as first symptom or sign which alarmed them and brought them to seek for medical help. Other symptoms like postauricular pain, epiphora, hyperacusis and ageusia were much less reported by the patients in our study compared with the study done by Adour KK10 in 1974. The reason for this maybe due to the fact that patients did not volunteer to inform or the primary caretakers did not record them.

After six to 12 months follow-up, 70 (83.3%) patients had full recovery of facial nerve paralysis. On the other hand, 13 (15.4%) patients regained partial recovery and one (1.2%) patient with HB Grade V facial nerve paralysis did not recover at all during the twelve months period of follow-up. Literature review quoted the percentage of full recovery of idiopathic facial nerve paralysis was between 70% to 95% depending on the grading system and treatment given by different caretakers. Peitersen[11] showed 71% of patients regained normal function of facial muscles after an idiopathic paresis meanwhile Hato N *et al*[12] showed 92.5% of patients had full recovery of facial nerve paralysis in their study. In our study, 83.3% of patients with different grading of facial nerve paralysis regained normal function of facial nerve.

Table I: House-Brackmann Grading Scale (HBGS)[7]

Grade I	Normal symmetrical function in all areas.
Grade II	Slight weakness noticeable only on close inspection. Complete eye closure with minimal effort. Slight asymmetry of smile with maximal effort. Synkinesis barely noticeable, contracture or spasm absent.
Grade III	Obvious weakness but not disfiguring. May not be able to lift eyebrow. Complete eye closure and strong but asymmetrical mouth movement with maximal effort. Obvious but not disfiguring synkinesis, mass movement or spasm.
Grade IV	Obvious disfiguring weakness. Inability to lift brow. Incomplete eye closure and asymmetry of mouth with maximal effort. Severe synkinesis, mass movement and spasm.
Grade V	Motion barely perceptible. Incomplete eye closure, slight movement of corner of mouth. Synkinesis, contracture, spasm usually absent.
Grade VI	No movement, loss of tone. No synkinesis, contracture or spasm.

Table II: Patients' Demographic and Clinical Data

Variables	No. (%)
Number of patients	84
Age at first visit in clinic (mean) in years	35(range 3-77)
Male / female	46(54.8)/38(45.2)
Side of palsy (left/right)	43(51.2)/41(48.8)
Race (Malay/Chinese/Indian/other)	35/16/30/3
Symptoms	
Facial weakness	84(100)
Epiphora	25 (30)
Hyperacusis 17(20.2)	
Postauricular pain	10(11.9)
Ageusia 6 (7.2)	
First consultation after symptoms	
Third day or earlier	45(53.6)
Fourth day or later	39(46.4)
Associated medical illness	13(15.5)
Diabetes mellitus	8(61.5)
Hypertension	7(53.8)
Ischemic heart disease	1 (7.7)

Table III: Outcome of treatment after 12 months of follow-up by comparison between initial grading with outcome grading in the number of patients.

	Outcome Grade (No)			
Initial Grade(NO)	Grade I	Grade II	Grade V	Total
Grade II	16	0	0	16
Grade III	34	9	0	43
Grade IV	19	3	0	22
Grade V	1	0	1	2
Grade VI	0	1	0	1
Total	70	13	1	84

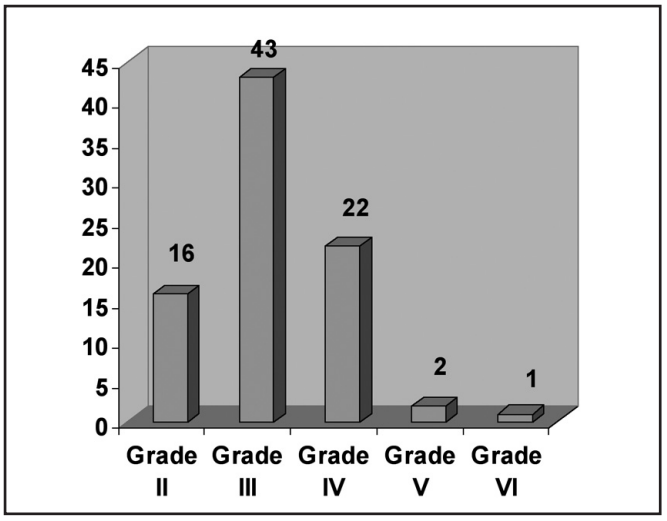

Fig. 1: Severity of Facial Nerve Paralysis Based on HBGS Initial Presentation

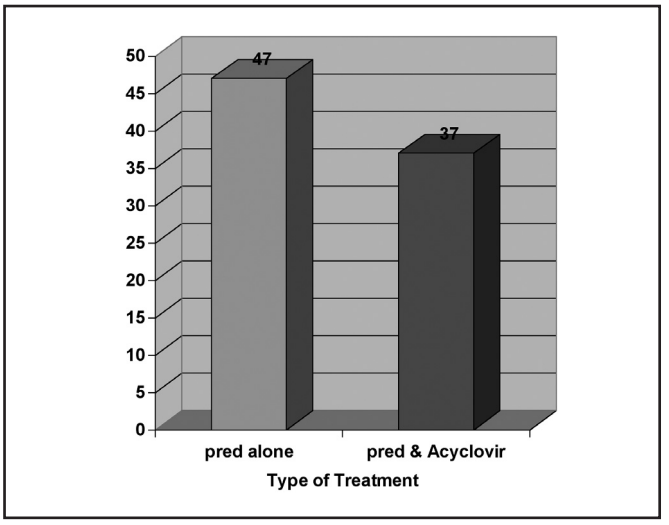

Fig. 2: Treatment of Facial Nerve Paralysis

Thirty-four (72.3%) out of 47 patients had full recovery of facial nerve paralysis who were treated with oral prednisolone alone meanwhile 36(97%) out of 37 patients who were treated with combined oral prednisolone and acyclovir had fully recovered. The difference was statistically significant with *p* value of 0.002 (Pearson Chi-square test). Meanwhile, the patients who were treated early within the first three days of the initial symptoms had higher rate of fully recovery regardless of the treatment regime. The difference compared with late treatment after third day was statistically significant.

The difference in the outcome of treatment with prednisolone alone or prednisolone with acyclovir was also noted in the study done by Hato N *et al*.[12]. His study showed 88.6% of total recovery with oral prednisolone alone and 95.7% with oral prednisolone and acyclovir which was significant statistically. Adour *et al*[13] also demonstrated the efficacy of treatment with acyclovir and prednisolone compared with prednisolone alone.

Herpes virus has been implicated as a causative pathogen for Bell's palsy in recent molecular biological investigations[14]. Herpes simplex virus genomes were detected in the facial nerve fluids on 79% of patients with Bell's palsy in 1996[15]. Furuta Y *et al*[16] detected serological and PCR studies positive of varicella zoster virus in 8 to 29% of diagnosed with Bell's palsy patients without any vesicles. Conversely, Varicella Zoster virus reactivation was detected in 29% of Bell's palsy patients as zoster sine herpes[16]. Bell's palsy is a neuropathy without significant cause. Herpes virus may appear as a subtle cause for the paralysis, therefore treatment with acyclovir is advisable. Acyclovir is a nucleotide analogue that interferes with herpes virus DNA polymerase and inhibits DNA replication. It is advised to start acyclovir treatment as soon as possible after diagnosis as it is less effective later after onset because acyclovir affects only replicating viruses and is unable to destroy viruses that have already replicated[17].

Prednisolone is an anti inflammation agent. It terminates and reduces the inflammation process which caused the swelling of the facial nerve in its narrow bony canal which subsequently causes compression to the nerve and impaired the nerve function. A meta-analysis of corticosteroid treatment of idiopathic facial nerve paralysis done by Ramsey M J *et al*[8] in 2000 concluded that better outcomes for individual with complete idiopathic facial nerve paralysis who was treated with steroids. Patients with complete idiopathic facial nerve paralysis should be treated with minimum of 400mg prednisolone or an equivalent dose of corticosteroid started within seven days of the onset of facial weakness. Corticosteroid treatment improved the incidence of complete facial complete facial recovery by 17%. All patients should be treated initially and as close to the onset as possible regardless of the severity of the palsy.

We also noted there was a likelihood of poorer chance of complete recovery of facial nerve with increased age more than 50 years, concurrent association with chronic medical illness like diabetes mellitus, hypertension and facial nerve palsy with HB grade IV to VI during initial presentation. However, the differences were not significant statistically. Adour KK *et al*[10] concluded the similar findings as in our study with the patients with medical conditions e.g. Diabetes, hypertension and age greater than 60 years, association with greater severity of idiopathic facial nerve paralysis and with poor outcome of this disease.

In our study, we also concluded that there was no correlation with total recovery of facial nerve palsy with gender and laterality.

CONCLUSION

Bell's palsy is a common problem affecting the facial nerve. The outcome of complete recovery is better with the patients treated with combined acyclovir and prednisolone compared to prednisolone alone. The patients treated after three days of clinical presentation, age more than 50 years of age, concurrent chronic medical illness and facial nerve paralysis HB Grade IV to VI during initial presentation have reduced chance of full recovery of facial nerve paralysis.

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