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Prognosis of patients with peripheral facial palsy

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Abstract:

[Purpose] We analyzed the evaluation of facial motor paralysis em-ploying Yanagihara's 40-point method for patients diagnosed with Bell's palsy, aiming to obtain some prognostic findings.

[Subjects and Methods] The subjects were 33 patients diagnosed with Bell's palsy referred to us by the otorhinolaryngology outpatient clinic of our hospital. The onset age, timing of initiation of re- habilitation after onset, accessory symptoms, and facial motor para- lysis were investigated. Facial motor paralysis was evaluated at the time of the first rehabilitation session and every 1-2 weeks thereafter. The scores were divided into upper and lower facial muscle groups.

[Results] On the basis of outcome, patients were divided into 3 groups: the most favorable group, the favorable group, and the poor group. In the comparison of the 3 groups, the score of the first evaluation and the mean weekly score change were significantly greater in patients with favorable outcomes. In the comparison between the upper and lower facial muscles, the score for the upper facial muscles was signifi- cantly higher from the early phase, and the muscles recovered from paralysis more rapidly.

[Conclusion] We evaluated facial motor para- lysis of patients with peripheral facial palsy employing Yanagihara's method as a prognostic index, and obtained some prognostic findings.

Key words:

Peripheral facial palsy, prognosis, Yanagihara's method

Introduction

Peripheral facial palsy occurs due to various causes, and Bell's palsy, which most frequently develops, is generally considered to be caused by the recurrence of herpes simplex virus infection[1-2]. Regardless of the cause, activities are not limited by functional disorders defined by the ICF based on the characteristics of this disease, but participation is restricted by changes in the facial complexion, for which physical therapy is requested from an early phase to improve the functional disorder in many cases. In this study, we analyzed the evaluation of facial motor paralysis employing Yanagihara's 40-point method[3] for patients diagnosed with Bell's palsy, and obtained some prognostic findings.

Yanagihara's method is the evaluation method proposed by Mr.Yanagihara for facial nerve palsy. This evaluation consists of 10 items

divided into the facial motor function, respectively, 4 to almost normal, 2 partial paralysis, paralysis zero attitude, rate of three stages. The evaluation scale has a maximum score of 40 points.

Subjects and Methods

The subjects were 33 patients (14 males and 19 females, mean age: 55.7 16.4 years (23-89 years)) who were referred to our rehabilitation department between January 2003 and December 2008 for peripheral

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facial palsy associated with Bell's palsy diagnosed by the otorhino-laryngology department of our hospital, and could be followed for more than 1 month. Patients in whom the cause of palsy was Hunt's syndrome, intracranial or extratemporal tumor, and trauma were excluded from the study. The present study was conducted according to the principles of the Declaration of Helsinki and approved by the ethics committees of Saiseikai Kyotofu Hospital. Facial motor paralysis was evaluated employing Yanagih ara's method at the initial rehabilitation and every 1-2 weeks thereafter, and the scores of the initial evaluation, one month, and the final evaluation were adopted for analysis. The scores were divided into upper (frontalis and orbicularis oculi muscles) and lower (risorius, orbicularis oris, and depressor anguli oris muscles) facial muscle groups, and differences in recovery from paralysis were investigated. Regarding accessory symptoms, gustatory, salivary and lacrimal secretion disorders, hyperacusis, and hearing loss were investigated by interview. In physical therapy, neuromuscular reeducation, self-training of paralyzed muscles, and instruction in daily living activities were performed, and low-frequency electrotherapy was additionally performed for patients with complete paralysis[4-5]. For statistical analysis, nonparametric analysis (Wilcoxon signed-rank sum, Mann-Whitney, and Kruskal-Wallis tests and Spearman's rank correlation coefficient) were performed, with a signifycance level of 5%.

Results

The facial palsy patients were divided into groups, the most favorable, favorable, and poor groups, based on the time required to recover and the recovery level. Patients in the most favorable group achieved complete recovery within 6 weeks (16 patients, mean age: 52.5 17.7 years), those in the favorable group took more than 6 weeks to achieve complete recovery (10 patients, mean age: 55.7 13.9 years), and those in the poor group did not achieve complete recovery even after 6 weeks (7 patients, mean age: 62.9 16.7 years). Regarding the relationship between the onset age and outcome, no significant difference was noted among the 3 groups (Table 1). The total scores (maximum: 40 points) of Yanagi hara's method at the initial evaluation were 15.0 5.4, 8.5 2.3, and 7.8 2.6 points in the most favorable, favorable, and poor groups, respectively, and significant differences between the most favorable and favorable groups and between the most favorable and poor groups ($p<0.01$) were found (Table 2). At about one month, the scores were 31.8 4.0,19.2 4.7,and 12.3 2.0 points, respectively, and significant differences were found between each of the groups (poor vs. favorable group: $p<0.05$, favorable vs. most favorable and poor vs. most favorable group: $p<0.001$) (Table 2). The mean weekly score changes at one month were 7.0 1.8, 4.2 1.6, and 1.9 0.9 in the most favorable, favorable, and poor groups, respectively, and significant differences were found between each of the groups (poor vs. favorable and favorable vs. most favorable group: $p<0.01$, poor vs. most favorable group: $p<0.001$) (Table 2).

The scores were divided into upper and lower facial muscle groups (maximum score: 12 points in each group), and score differences were analyzed. The scores were 5.3 2.1 and 2.1 1.9 for the upper and lower

Table 1. Time required for recovery and outcomes

	Number of patients	Mean age (years)
Complete recovery within 6 weeks (most favorable group)	16	52.5±17.7
Complete recovery after 6 weeks (favorable group)	10	55.7±13.9
Incomplete recovery even after 6 weeks (poor group)	7	62.9±16.7
Total	33	55.7±16.4

facial muscle groups at the initial evaluation, and 8.9 2.5 and 6.3 3.0 at one month, respectively. The scores were significantly higher in the upper facial muscle group at both the initial evaluation and one month, showing that the upper facial muscles recovered more rapidly than the lower facial muscles ($p<0.001$) (Table 3).

The patients were divided into those aged 50 years or older and those younger than 50 years for comparison. The score was higher in the younger group at the initial, one month, and final time points, showing that younger patients tend to recover more rapidly than those aged 50 years or older, but the difference was not significant (Table 4).

Accessory symptoms were noted in 10 of the 33 patients. The main symptoms were gustatory disorder and hyperacusis. Salivary and lacrimal secretion disorders and otalgia were also noted, but no significant association with the outcome was found for any of the accessory symptoms.

Discussion

The prognosis of Bell's palsy-associated peripheral facial palsy is relatively favorable. About 50% of patients completely recover within 6 weeks, and about 80% recover within 6 months at our hospital[6]. Peitersen reported that 71% of 2,570 patients with Bell's palsy recovered to a normal state[7].

Using Yanagihara's method for the evaluation of peripheral facial palsy-associated facial motor paralysis, the outcome of facial motor paralysis may be predicted from the initial score and mean weekly score change. When the initial score is 10 points (cut-off value) or lower, the prognosis is poor when the mean weekly change is only about 2 points, and tends to be favorable when the mean weekly change is about 4 points. In contrast, the prognosis is the most favorable when the initial score is high and the mean weekly change is as high as about 7 points, and rehabilitation can be predicted to be completed within about one month (Fig. 1). In a preceding study reported by Yamamoto, the lowest score was noted within

Table 2. Association between the mean score of each period and outcome

	Most favorable group	favorable group	poor group
Initial evaluation	15.0±5.4	8.5±2.3**	7.8±2.6**
At one month	31.8±4.0	19.2±4.7***	12.3±2.0***, †
Weekly score change	7.0±1.8	4.2±1.6**	1.9±0.9***, ††

Significant difference from most favorable group are denoted**, ***, for $p<0.01$ and $p<0.001$, respectively. Significant difference from favorable group are denoted†, ††, for $p<0.05$ and$p<0.01$ respectively.

Table 3. Comparison of the upper and lower facial muscle scores

	Upperfacialmuscles	Lower facialmuscles
Initial evaluation	5.3±2.1	2.1±1.9***
At one month	8.9±2.5	6.3±3.0***

Significant difference from Upperfacialmuscles are denoted***, for $p<0.001$.

Table 4. Relationship between the age and score at each time point.

	49 years or younger	50years orolder
Initialscore	13.8±5.1	10.2±5.1
One－monthscore	26.3±9.2	22.4±8.8
Finalscore	34.4±2.6	30.5±9.0

The score was higher in the young group at all time points, but no significant difference from the old group was found.

10 days after onset, and cases with a score lower than 8 based on Yanagihara's40-point method tended to show a poor outcome[8]. Hamano et al. reported that the outcome was poor in 64% when the lowest score after the onset was 6 or lower based on Yanagihara's 40-point method, and 98% when the score improved by 0 points at 2 weeks after the initiation of physical therapy[9].

Regarding the differences between the upper and lower facial muscles, the score was significantly higher in the upper facial muscle group at both the initial and one-month time points, showing that the recovery from paralysis was more rapid in the upper facial muscles. The upper facial muscles may be more strongly influenced by associated reactions promoting recovery. Since the motor points of the upper facial muscles are located closer to the lesion, nerves may recover more rapidly in the first month. Similar findings were reported by Watanabe et al. They reported that the score at 3 weeks after onset was higher in muscles around the eye than in those around the mouth, because muscles around the mouth move cooperatively, and muscles
on the paralyzed side do not readily move when muscles on the nonparalyzed side move dominantly[10].

Regarding the association between onset age and prognosis, we expected a more rapid recovery and higher evaluation score in younger patients, but no significant differences were noted, although the score tended to be higher and the outcome tended to be more favorable for the younger patients, a result which may have been due to the small number of cases and the high rate (about 80%) of favorable outcomes. Hamano et al. reported that the odds ratio at an age of 40 years or older was significantly larger (3.2 times) than that at younger than 40 years for delayed recovery from paralysis[8]. The recovery from paralysis has also been reported as poor in middle-aged and elderly groups compared to young groups by many other investigators[11-13], and age-related susceptibility to nerve injury and a reduced recovery ability were pointed out as the causes[14].

No significant accessory symptom-associated delay in recovery was noted. Many accessory symptoms are those of the intermediate nerve system, such as gustatory disorder and hyperacusis, and anatomically, the lesion is relatively distant, which may have led to early recovery even in cases with these accessory

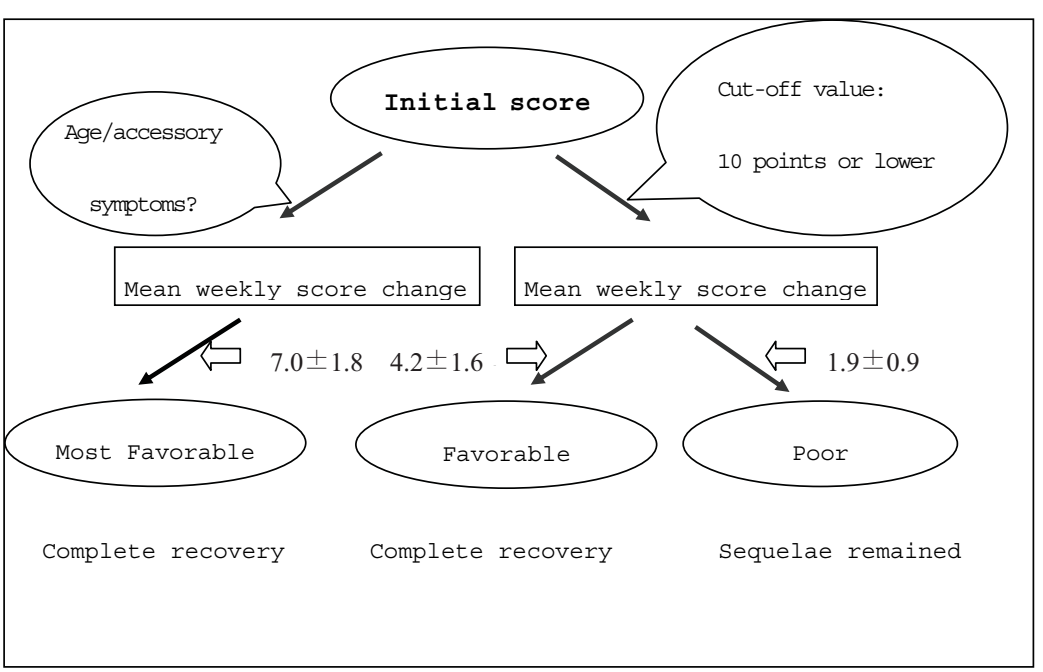

Fig. 1. Comparison of the scores between the upper and lower facial muscles

symptoms. In contrast, in cases with accessory symptoms of the vestibulocochlear nerve system, such as hearing loss and vertigo, the anatomical location of the lesion is proximal, and it has been reported to increase the risk of a prolonged recovery[9-15]. Otalgia is a symptom of facial neuritis and its presence indicates that nerve tissue inflammation is severe, suggesting that recovery from paralysis will be delayed. Since the location of the lesion and severity of inflammation can be anatomically predicted from accessory symptoms to some extent, this information is useful for predicting the recovery, and it may be necessary to include these in the evaluation items determined by interview.

In conclusion, in making a prognosis for patients with peripheral facial nerve palsy, the initial evaluation score and the mean weekly score change are important factors. Furthermore, in the comparison between the upper facial muscles and the lower facial muscles, the score was always higher in the upper facial muscles, showing that the upper facial muscles tend to recover rapidly from paralysis.

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