

Original Article

# The Comparative Study on Oriental Medicine Treatments of Facial Paralysis Due to Mastoiditis and Bells Palsy

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## Abstract

**Objectives** : The purpose of this study is to compare the improvement of facial paralysis due to mastoiditis and bells palsy.

**Methods** : Fifteen patients with facial paralysis due to mastoiditis and Fifteen patients with bells palsy who visited the Daejeon Oriental Medical Hospital of Daejeon University were evaluated. Evaluation was carried out by Yanagihara's unweighted grading system.

**Results** : 1. According to bells palsy and facial paralysis due to mastoiditis, in grade comparison between two groups according to cure period, there is no difference between the averages of both groups.

2. According to bells palsy and facial paralysis due to mastoiditis, theraputic effects are similarly increased between two groups.

3. According to bells palsy and facial paralysis due to mastoiditis, In cure score change according to cure period, there is grade difference according to cure period.

**Conclusion** : With this result, when the same treatment is done to bells palsy and facial paralysis due to mastoiditis, there is the same theraputic significance.

**Key words** : Mastoiditis, Bells palsy, Facial paralysis

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## I. Introduction

Mastoiditis is the most common complication of middle ear disease as acute otitis media(AOM) or chronic otitis media. Because the mastoid is contiguous to the middle ear and eardrum, the otitis media is accompanied by the mastoiditis<sup>1)</sup>. Mastoiditis is caused by *Streptococcus pneumoniae*, that is same with AOM's<sup>2)</sup>.

Mastoiditis has been classified into two types, classic(acute) mastoiditis and latent(chronic) mastoiditis. Classic mastoiditis refers to acute disease following AOM. Recently, antibiotic treatment of AOM has decreased the incidence of acute mastoiditis, but chronic mastoiditis can lead to meningitis, facial paralysis, deafness, vertigo or dizziness as complications.

All bacterial infections that invade middle ear can cause facial paralysis. Clinically, in case of otitis media, mastoiditis, malignant outer ear inflammation and so on<sup>3)</sup>. The ratio of facial paralysis which is the complication of middle ear disease occupies 6-8% of all peripheral facial paralysis<sup>4)</sup>.

Idiopathic facial nerve palsy(Bells palsy), the most common form of facial paralysis, is acute disease by non-suppurative infection of facial nerve in the stylomastoid foramen<sup>5)</sup>. Bells palsy have unknown cause but viral infection is most potential. Exposure to coldness, anxiety, psychogenic shock can lead to Bells palsy<sup>6)</sup>.

In oriental medicine, mastoiditis is the Poison of ear root(acute suppurative mastoiditis), its symptoms are redness, pain and itching of post ear, escalating pain and heat, abscess formation and shedding pus resulting in sore on bone<sup>7)</sup>. For treatment, dissipating heat and detoxifying and sweat-inducing method were used in early phase. In case of latent phase, benefiting vital energy and nourishing blood were added to therapeutic method.

In the deficient condition of treatment, progress, prognosis and classification with bells palsy of facial paralysis due to mastoiditis, there is significance

in consequence of same oriental-medical treatment with each 15 cases of bells palsy(Group A) and facial paralysis due to mastoiditis(Group B), so report the outcome.

## II. Objects and methods of study

### 1. Object of study

This study is clinical analysis based on the result of oriental medicinal therapy carried out on 15 bells palsy(Group A) and 15 mastoiditis patients(Group B) diagnosed on X-ray in the Daejeon University Hehwa hospital, among facial paralysis patients treated by admission or outpatient over 4 weeks in the Acupuncture & moxibustion part of Oriental medical hospital, Daejeon University from January 2005 to September 2005.

### 2. Method of study

Medical examinations were done about sex and age distribution, occurrence period, occurrence cause, occurrence direction, accompanying symptoms and cure score change according to cure period. The criteria for the diagnosis of mastoiditis and other major ones are as follows.

#### 1) Diagnosis of mastoiditis

Patients are diagnosed by subjective symptoms, physical examinations and simple mastoid X-ray, and discriminated from similar diseases by Brain CT, Brain MRI.

#### 2) Classification of facial paralysis

Facial paralysis grade at the first medical examination and its cure score at level were evaluated by Yanagihara's unweighted grading system<sup>8)</sup>(Table 1).

Table 1. Yanagihara,s unweighted grading system

	scale of five rating
At rest	0 1 2 3 4
Wrinkle forehead	0 1 2 3 4
Blink	0 1 2 3 4
Closure of eye lightly	0 1 2 3 4
Closure of eye lightly	0 1 2 3 4
Closure if eye on involved side only	0 1 2 3 4
Wrinkle nose	0 1 2 3 4
Whistle	0 1 2 3 4
Grin	0 1 2 3 4
Depress lower lip	0 1 2 3 4

### 3. Treatment method

#### 1) Acupuncture method

Stainless steel disposable needles (0.25×30mm) manufactured by Zeus Korea Acupuncture Development Co. were used in this treatment. The depth of needle varies from 5 to 20 mm according to acupuncture point. Acupuncture treatment was operated two times a day. Retaining time was 25-30 minutes according to the condition of patient. Selection of points are Jichang(ST4), Hyeopgeo (ST6), Yangbaek(GB14), Sabaek(ST2), Chanjuk(BL2), Sajukkong(TE23), Sugu(GC26), Seungjang(CC24), Joksami(ST36), Haegye(ST41) and so on. They are on affected side.

#### 2) Drug treatment

Wugakseongma-tang, Leekikyenjung-san, Ssanghwa-tang, Bojungicki-tang, adapted from the Prescription book of Oriental medical hospital, Daejeon University, were used according to diagnosis and treatment based on overall analysis of symptoms and signs.

#### 3) Physical treatment

SSP, Infra-Red two times per day, Jelly pack on affected mastoid process for 20 minutes 2

times per day, eye washing using normal saline several times per day and Hot pack etc, were treated on affected face.

#### 4) Life style guidance

Patients were tutored in facial massage and everyday directions.

### 4. Assessment of cure score

The assessment of cure score is graded in 5 classes by Yanagihara's unweighted grading system<sup>9)</sup>. Yanagihara Score uses 5-point system which is composed of 4-normal, 3-slight parasis, 2-moderate, 1-severe, 0-total. The score of each part is added to final score and the final maximum score of scale is 40(Table 1).

### 5. Statistics

SPSS 12.0K was used to take statistics on experimental data, and chi-square test was done to confirm frequency analysis, cross analysis and interrelation grade between categorical variables. Non-parameter method was used to compare average according to group or cure period, with Mann Whitney and Kruskal-Wallis test, p-value was 0.05.

### III. Results

#### 1. Sexual distribution

Sexual distribution by each group as follows (Table 2).

#### 2. Age distribution

Age distribution by each group as follows (Table 3).

#### 3. Occurrence period distribution

Occurrence period distribution by each group as follows (Table 4).

#### 4. Occurrence cause distribution

Occurrence cause distribution by each group as follows (Table 5).

#### 5. Occurrence direction distribution

Occurrence direction distribution by each group as follows (Table 6).

#### 6. Accompanying symptoms distribution

Accompanying symptoms distribution by each group as follows (Table 7).

#### 7. Grade comparison according to cure period

Grade comparison according to cure period by each group as follows (Table 8).

#### 8. Cure score change according to cure period

Cure score change according to cure period by each group as follows (Table 9).

Table 2. Sexual distribution

		Sex		Total
		Male	Female	
Group A	Frequency (%)	8 (53.3%)	7 (46.7%)	15 (100.0%)
Group B	Frequency (%)	9 (60.0%)	6 (40.0%)	15 (100.0%)
Total	Frequency (%)	17 (56.7%)	13 (43.3%)	30 (100.0%)

Table 3. Age distribution

		Age					Total
		under 20's	30's	40's	50's	over 60's	
Group A	Frequency (%)	1 (6.7%)	2 (13.3%)	4 (26.7%)	5 (33.3%)	3 (20.0%)	15 (100.0%)
Group B	Frequency (%)	1 (6.7%)	1 (6.7%)	3 (20.0%)	3 (20.0%)	7 (46.7%)	15 (100.0%)
Total	Frequency (%)	2 (6.7%)	3 (10.0%)	7 (23.3%)	8 (26.7%)	10 (33.3%)	30 (100.0%)

Table 4. Occurrence period distribution

		Occurrence period				Total
		Spring	Summer	Autumn	Winter	
Group A	Frequency	3	3	7	2	15
	(%)	(20.0%)	(20.0%)	(46.7%)	(13.3%)	(100.0%)
Group B	Frequency	3	5	4	3	15
	(%)	(20.0%)	(33.3%)	(26.7%)	(20.0%)	(100.0%)
Total	Frequency	6	8	11	5	30
	(%)	(20.0%)	(26.7%)	(36.7%)	(16.7%)	(100.0%)

Table 5. Occurrence cause distribution

		Causes		Total
		Fatigue	Coldness	
Group A	Frequency	9	6	15
	(%)	(60.0%)	(40.0%)	(100.0%)
Group A	Frequency	9	6	15
	(%)	(60.0%)	(40.0%)	(100.0%)
Total	Frequency	18	12	30
	(%)	(60.0%)	(40.0%)	(100.0%)

Table 6. Occurrence direction distribution

		Direction		Total
		Left	Right	
Group A	Frequency	6	9	15
	(%)	(40.0%)	(60.0%)	(100.0%)
Group B	Frequency	9	6	15
	(%)	(60.0%)	(40.0%)	(100.0%)
Total	Frequency	15	15	30
	(%)	(50.0%)	(50.0%)	(100.0%)

Table 7. Accompanying symptoms distribution

		Symptoms					Total
		Pain	Tear	Taste	Hearing	Blister	
Group A	Frequency	15	14	4	0	0	15
	(%)	(100.0%)	(93.3%)	(26.7%)	(0.0%)	(0.0%)	(50.0%)
Group B	Frequency	13	13	3	1	1	15
	(%)	(86.7%)	(86.7%)	(20.0%)	(6.7%)	(6.7%)	(50.0%)
Total	Frequency	28	27	7	1	1	30
	(%)	(93.3%)	(90.0%)	(23.3%)	(3.3%)	(3.3%)	(100%)

Table 8. Grade comparison according to cure period

	Group A(n=15)	Group B(n=15)	p-value
Admission day	15.07±2.09	14.93±3.20	0.660
After 1 weeks	19.87±1.69	18.47±3.72	0.101
After 2 weeks	23.93±1.53	22.73±3.70	0.473
After 3 weeks	27.33±1.29	26.53±3.40	0.817
After 4 weeks	30.07±1.49	29.87±3.50	0.966

Table 9. Cure score change according to cure period

	Group A(n=15)	Group B(n=15)
Admission day	15.07±2.09	14.93±3.20
After 1 weeks	19.87±1.69	18.47±3.72
After 2 weeks	23.93±1.53	22.73±3.70
After 3 weeks	27.33±1.29	26.53±3.40
After 4 weeks	30.07±1.49	29.87±3.50
p-value	< 0.001	< 0.001

## IV. Discussion

Mastoiditis is an inflammation of the mastoid air cells in the temporal bone. Because the mastoid is contiguous to the middle ear and eardrum, most people with acute otitis media (AOM) or chronic middle ear inflammatory disease have mastoiditis<sup>10</sup>. Generally, major bacterias that cause mastoiditis are same to ones that cause otitis media and the treatment of mastoiditis is also same to that of AOM<sup>11</sup>.

Mastoiditis has been classified into two types, classic(acute) and latent(chronic). Classic mastoiditis refers to acute disease following AOM, its symptoms are fever, pain, swelling and redness of the skin behind the ear, some degree of hearing impairment etc. Latent mastoiditis refers to a more chronic disease, which can be subclinical.

Recently, antibiotic treatment of AOM has decreased the incidence of acute mastoiditis, but chronic mastoiditis can lead to meningitis, facial paralysis, deafness, vertigo or dizziness as complications<sup>12</sup>.

All bacterial infections that invade middle ear can cause facial paralysis. Clinically, in case of otitis media, mastoiditis, malignant outer ear inflammation and so on, compression to the dehiscence of facial nerve canal, the osteitis of surrounding bone, the compression of cholesteatoma mass and the invasion of abscess to facial nerve canal are major causes. Secondary nerve edema and destruction are also major ones<sup>13</sup>.

The ratio of facial paralysis which is the complication of middle ear disease occupies 6-8% of all peripheral facial paralysis<sup>14</sup>. In children, AOM mostly causes facial paralysis, but in adults, nerve compression caused by chronic cholesteatoma mass effect is the major cause of facial paralysis<sup>15</sup>. Facial paralysis caused by AOM is happened in first two weeks of post inflammation period, but prognosis is good because incomplete paralysis are more than complete paralysis. Facial paralysis due to chronic otitis media is caused by the invasion of osteitis or cholesteatoma to facial nerve canal, and it can be cured by the removal of them<sup>16</sup>. Facial paralysis is caused by chronic mastoiditis and similar to bells palsy.

Idiopathic facial nerve palsy(Bells palsy) which occupies most part of facial paralysis, is reported to occur in 20-30 people out of 100000. Man to woman ratio is equivalent. It can occur in all age. It occurs equivalently in right and left, mostly unilaterally. 30% is incomplete paralysis and 70% is complete paralysis. The ratio of bilateral paralysis is 0.3%. 9% has past history and 8% has family history<sup>17)</sup>.

There are many theories for the cause of bells palsy, including viral infection, paralysis due to ischemic vascular disease, vascular disorder by diabetes mellitus, multiple neuritis, autoimmunity, exposure to coldness, genetic inheritance and so on. Of all causes, viral infection is most potential<sup>18)</sup>.

The symptoms of Bells palsy are viral premonitory symptoms (60%), hypesthesia or paresthesia of glossopharyngeal or trigeminal nerve (80%), paresthesia and pain of face or neck (60%), dysgensia (57%), acoustic hyperesthesia (30%), hypolacrimation (17%), epiphora, tinnitus and so on<sup>18)</sup>.

Bells palsy is occurred in one or two days after post ear pain and recovered over 80% in some weeks to some months. If it is incomplete paralysis for one week after facial paralysis, prognosis is reportedly good. It shows non-progressive spontaneous cure and is cured in 4-6 months. The variety of sex, age, occurrence direction, affected period, and occurred time makes no difference to recovery<sup>19)</sup>.

In the view of oriental medicine, mastoiditis is the Poison of ear root(acute suppurative mastoiditis) and written in 《Hwangjenaegyong》, 《Chang-yanggyeongheomjeonseo》, 《Oegwajeongjong》, 《Oegwadaeseong》, 《Chang-yangdaejeon》 and so forth<sup>20)</sup>. In acute case, liver heat stagnation due to stagnation of liver Gi and heat toxins due to external affected wind and heat are causes. In chronic case, lack of Gi and blood, Eum deficiency of liver and kidney, latent toxin which is not yet cleared are causes<sup>21)</sup>. Symptoms are redness, pain and itching of post ear, escalating pain and heat, abscess formation and shedding pus resulting in

sore on bone. For treatment, dissipating heat and detoxifying and sweat-inducing method were used in early phase. In case of latent phase, benefiting vital energy and nourishing blood were added to therapeutic method.

Oriental medicinal therapy of bells palsy uses Wugakseongma-tang, Leekikyenjung-san, Ssanghwa-tang, Bojungicki-tang etc, with the aim of helping meridian energy through, expelling wind and clearing away cold, and regulating Gi and blood.

This study is clinical analysis based on the result of oriental medicinal therapy carried out on 15 bells palsy(Group A) and 15 mastoiditis patients(Group B) diagnosed on X-ray in the Daejeon University Hehwa hospital, among facial paralysis patients treated by admission or outpatient over 4 weeks in the Acupuncture & moxibustion part of Oriental medical hospital, Daejeon University from January 2005 to September 2005.

In sexual cross analysis classified by group, Group A has 8 men(53%) and 7 women, and Group B has 9 men(60.0%) and 6 women(40.0%). Based on chi-square examination to survey sexual difference, p-value is 0.713, therefore there is no difference due to sex between two groups.

In age cross analysis classified by group, Group A has most in fifties (33.3%), following forties (26.7%), over sixties (20.0%), thirties (13.3%), under twenties (6.7%). Group B has 7 patients in sixties (46.7%), 3 patients in forties and fifties (20.0%), and 1 patient in under twenties and thirty. Based on chi-square examination to survey age difference, p-value is 0.631, therefore there is no difference due to age between two groups.

In occurrence period cross analysis classified by group, Group A has the maximum patients of 7 in autumn(46.7%), Group B has those of 5 in summer(33.3%).

In occurrence cause cross analysis classified by group, both have 9 patients in overwork(60.0%) and 6 patients in wind-and-heat(40.0%)

In occurrence direction cross analysis classified by group, Group A has 9 patients in right(60.0%)

and 6 patients in left(40.0%), but Group B has 9 patients in left(60.0%) and 6 patients in right (40.0%). p-value was 0.273 based on chi-square examination, so there is no difference between two groups.

In accompanying symptoms analysis classified by group, Group A has pain, epiphora, dysgensia, acoustic hyperesthesia and vesicles respectively on 15, 14, 4, 0, 0 patients and Group B has them respectively on 13, 13, 3, 1, 1 patients.

In grade comparison between two groups according to cure period, Group A and Group B have respectively  $15.07 \pm 2.09$  and  $14.93 \pm 3.20$  (p-value 0.660), and after 4 weeks they have respectively  $30.07 \pm 1.49$  and  $29.87 \pm 3.50$  (p-value 0.966). So there is no difference between the averages of both groups.

On the basis of grade measured at hospitalization, the first week converted grades by each week are  $4.80 \pm 1.32$  and  $3.53 \pm 3.14$  (p-value 0.170) for Group A and Group B respectively, and the forth week converted grades are  $15.00 \pm 2.80$  and  $14.93 \pm 3.20$  (p-value 0.802) for Group A and Group B respectively. Therefore therapeutic effects are similarly increased between two groups.

In cure score change according to cure period, the average increased as time went by and p-value is under 0.001 on examination. So there is grade difference according to cure period.

With this result, when the same treatment is done to bells palsy and facial paralysis due to mastoiditis, there is the same therapeutic significance.

## V. Conclusions

1. According to bells palsy and facial paralysis due to mastoiditis, in grade comparison between two groups according to cure period, there is no difference between the averages of both groups.
2. According to bells palsy and facial paralysis

due to mastoiditis, therapeutic effects are similarly increased between two groups.

3. According to bells palsy and facial paralysis due to mastoiditis, In cure score change according to cure period, there is grade difference according to cure period.

With this result, when the same treatment is done to bells palsy and facial paralysis due to mastoiditis, there is the same therapeutic significance.

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