Effect of Mime Therapy and Conventional Therapy on Bell's Palsy Patients

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Abstract: "Effect of Mime Therapy and Conventional Therapy on Bell's Palsy Patients". <u>Background</u>: There are many different known physiotherapy treatment used in the management of Bell's palsy, Mime therapy being a relatively novel approach among them. However, there is dearth of evidence about the effectiveness of mime therapy in Bell's palsy patients. Hence, there is a need for this experimental comparative study to find the effectiveness of mime therapy in the management of Bell's palsy. <u>Objective</u>: To compare the effects of mime therapy and conventional therapy in improving with facial function and symmetry of bell's palsy patients. <u>Methodology</u>: Experimental design with a sample size of 30 which is randomly allocated into 2 groups with 15 samples in each groups: experimental group, which received mime therapy and the control group, which received conventional therapy were given 45 minutes / day for 5 sessions in a week for 3 weeks. The outcome measures taken were sunny brook facial grading system for checking the facial symmetry and House Brackmann facial grading system for measuring the severity of paresis. <u>Results</u>: Both group showed a significant improvement 1.9333 in experimental group and 1.5333 in control group, (U=72.0, P=0.109, P<0.05). In SBFGS between experimental group and control group shows that average improvement in experimental group was 32.5333 and in control group is 25.2667 (T=1.983, P= 0.015, P<0.05). <u>Conclusion</u>: The findings suggested that mime therapy and conventional treatment are equally effective. These results must be confirmed by further studies with larger sample size and longer follow - up.

Keywords: Facial paralysis, Physiotherapy, Facial Asymmetry, Sunnybrook facial grading system, House brackmann facial grading system

1. Introduction

Bell's palsy has been primarily considered a cosmetic inconvenience with associated functional problems. Restoring function and expression to the highest-level possible results in improved health, self - esteem, self acceptance, acceptance by others, and quality of life. Individuals with facial paralysis and distorted facial expressions and movements secondary to a facial neuromotor disorder experience substantial physical, psychological, and social disability. Bell's palsy is the sudden onset of paralysis of facial muscles on one side of the face due to inflammation of the facial nerve within the facial canal ^{(1).} Symptoms that peak at about 2 weeks from onset include facial asymmetry, inability to close the eye, tearing and drooling. The incidence is about 32/100, 000 in a year or about 1/60 people in life time. Bell's palsy has a peak incidence between the ages of 15 - 45 years and men and women are equally affected as well as in the various races also approximately equal (2). Current treatments for bell's palsy are drug therapy, decompression surgery & physiotherapy. Drug therapy includes corticosteroids (oral prednisone) reduce the duration of paralysis and risk of permanent impairment and anti - viral medications, such as acyclovir or valacyclovir, shorten the course or improve outcome in bell's palsy are no longer part of the routine management of idiopathic facial palsy (3) and occasionally advocate, the decompression surgery (4).

There are variety of physiotherapy interventions have been used to treat bell's palsy ^{(5, 6, 7, 13),} randomised controlled trials have found no evidence in favour of one intervention over another. Mime therapy being a relatively novel approach among them and it is emphasing on stimulation of facial emotional expression and functional movements ^{(9).} The aims of the treatment are to promote symmetry of the face at rest and during movement, enabling the patient to control synkinesis or mass movements, resulting in better handling of the handicap. Mime therapy also addresses psychosocial aspects of facial nerve paresis, as well as the patient's quality of life. Patients can perform these exercises easily daily at home, assisted by a homework manual. However, there is paucity of evidence about the effects of mime therapy in bell's palsy patients.

The purpose of this experimental study was to compare the effects of mime therapy and conventional therapy on facial function, facial symmetry, and paresis in patients with Bell's palsy. Our main hypothesis was that mime therapy may have significant effect in Bell's palsy patients.

2. Materials and Methods

2.1 Participants

Participants were patients with complete or partial paralysis of the facial muscles of expression of the whole of one side of the face with sudden onset, are referred from the medicine and neurology wards to the outpatient department of physiotherapy in K. S. Hegde Hospital, Deralakatte, Karthikeya Physiotherapy centre, B C road, Mangalore. A total of 30 patients with both males and females, between the age group of 15 - 45 years diagnosed with Bell's palsy were recruited for this study by purposive sampling method. These patients were randomly allotted by lottery method as 15 patients for each group, experimental group received

mime therapy and control group received conventional therapy both for 3 weeks. Exclusion criteria were as follows (1) Patient with history of recent head injury, Neurological disorders, (2) Patient with history of Metal/Dental implants, (3) Patient with history of diabetic neuropathy, (4) Patient with history of immunodeficiency syndromes, (5) Viral infections like herpes simplex, (6) Tumours, congenital defects, open wounds, (7) Recurrent facial paralysis (9) Noticeable asymmetry of the face before the illness which may affect the evaluation. Informed consent was obtained from each patient before participation in the study. The study was approved by the Central Ethical committee of Nitte University, Mangalore.

Outcome Measures:

The outcome measures (8, 13) are the House - Brackmann Facial Grading System (HB - FGS), developed in 1985, is one of the most widely used and accepted scales. It divides the patient's impairments into six categories, ranging from normal function (grade I) to complete paralysis (grade VI), and has been shown to have excellent interrater reliability. However, the responsiveness of the HB - FGS is low in that it does not reflect changes resulting from treatment or changes that occur over time. Because synkinesis is not scored separately in the HB - FGS, changes in synkinesis following treatment cannot be measured. When comparing the both facial grading system, the SB - FGS was simpler and quicker to administer and resulted in a wider response range compared with the HB - FGS. Sunnybrook Facial Grading System developed in Canada in 1996 by Ross and colleagues. It is composed of 13 items and measures 3 components of facial asymmetry like resting asymmetry (Rest, ranging from 0 to 4), facial symmetry in voluntary movement (Move, ranging from 5 to 25), and synkinesis (ranging from 0 to 15). This facial grading system ranging from - 15 (complete paralysis) to 100 (normal). It has been shown to have excellent interrater reliability (.90). For recording SBFGS, The patients were seated in a chair and were asked to maintain their face in midline and to relax the face, neck, and shoulders, looking straight ahead, with their back against the wall and feet flat on the floor. This position was maintained for 2 minutes to record the face at rest. The patient was then asked to perform each movement slowly, thereby simultaneously controlling synkinesis, holding each position for 2 seconds and then relaxing. When synkinesis occurred in another part of the face, the patient tried to arrest the abnormal movement and maintain facial symmetry. After three trials were conducted and recorded. Patients were assessed before the intervention Sunny Brook - Facial Grading System and House - Brackmann Facial Grading System were used to see the patient's pre - test score. Both outcome scales were used to assess the facial function and facial symmetry. The pre - test scores were noted on the first day of treatment after complete assessment of the patient.

Experimental (Mime therapy) group:

Participants were treated on an individual basis. Fifteen, 45 - min sessions of mime therapy would deliver consisting about 5 sessions in a week over three weeks.

Mime therapy is a combination of mime and Physiotherapy to promote facial symmetry and facial function. First, participants would taught to massage their face and neck daily for 10-15minutes, to relax the facial musculature and promote circulation. Massage consists of effleurage and kneading both sides of the face. Following which stretching exercises of the affected side would perform to relieve mimetic muscles involved in synkinesis. Subjects were perform in a slow manner, following the course of the muscle, with the thumb of the hetrolateral hand placed into the mouth on the affected side and opposed to the fingers (15 seconds). Then, subjects were performed diaphragmatic breathing exercise in hook lying position and shoulder shrugging movements for reducing the tone over the face and whole body. Fourth, Subjects were performed the following exercises to coordinate both halves of the face and reduce the synkinesis. Basic exercises (forehead wrinkle, eye closure, smile, snarl, lip pucker) with variations in amplitude and speed, exercises for one side of the face to control separate movements, relaxation of the lower jaw, exercises of the mouth (smiling, pouting) and eye with simultaneous inhibition of synkinesis (slow, small movements and counteraction) were taught. A mirror was used for feedback. Fifth, Lip closure exercises comprised exercises of the cheek (filling the cheeks with varying amounts of air) and eating and drinking exercises while keeping the affected eye open (small movements). Sixth, exercises were performed to increase the participant's awareness of lip movements and the position of the mouth for various sounds. Vowels as a, e, i, o and u, and consonants such as p and b were used for the position of the lips. Lastly, expression exercises were taught. Mime therapy aims to develop a conscious connection between the use of certain muscles and facial emotional expression. Exercises were performed in two ways: working from the use of certain muscles towards an expression; or working from an expression as a starting point for a movement. For example, the participant was asked to raise the forehead or to perform an expression depicting amazement. Other expressions can be evoked by asking the participant to: open the eyes wide (surprise), lift the upper lip (disgust), or tighten the lips (anger).

Control (Conventional therapy) group:

Conventional therapy consists of first, faradic stimulation was used with 0.1-1 ms duration pulse were delivered at a frequency of 1-2 pulse/s or more. This was given for 90-100 contractions in each facial muscle and 10 contractions facial trunk session / intensity until minimal visible contraction for 5 session's week for 3 weeks. For stimulating muscles which is completed denervated interrupted galvanic stimulation of (IGS) of 100 ms triangular pulses had given at a rate of 1 pulse for 30-100 contractions in each facial muscle /session intensity until minimal visible contraction. Following, the massage included stroking over both sides of the face and neck; simultaneously (30 seconds) circular massage with three middle fingers were performed by working from the centre to outer face for 2 minutes. The researcher would use his thumb (protected by a sterile glove) on the inside of the cheek of the affected side and the three digits on the facial skin to draw the tissues toward the mouth (2 minutes). Relaxation of the face and neck muscles would attempted by using effleurage for 2 minutes. Kneading, picking up, and wringing were used to increase circulation, reduce involuntary contraction, and mobilize these muscles (2 minutes). The massage was concluded within 1 minute of

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hacking to evenly distribute the erythema and 30 seconds of stroking to induce relaxation at the end of the massage. Lastly the conventional therapy concluded with facial exercises were performed the subjects with proper instructions. For example like ask the patient to bring your eyebrows together and downward (frowning), raise your eyebrows as in being surprised, close your eyes gently and then tightly, flare nostrils by blowing out with your nose and compress nostrils in a sniffing attempt,. Smile with a closed mouth and then open mouth attempt to whistle by puckering your lips and compressing cheek and tighten you chin and neck to eventually pull your lower lip down to expose your lower teeth. Exercises were done to include both sides of the face by using a mirror to promote symmetry and feedback. If there is an overflow or abnormal movement coming in, the patient was asked to relax and try again with less effort. Home Program was carried out for 30 min every day for all patients included in study. Patients were assessed at the end of 3rd week of treatment using sunny Brook Facial grading system and house Brackmann Facial Grading system to evaluate facial muscle function and symmetry of the face in Bell's palsy patients.



Statistical Methods:

Data were analysed with SPSS Version 16.0. Mean and standard deviation calculated for age, gender and duration. In SBFGS within the group paired t - test and between the group unpaired t - test were used. In HBFGS within the group Wilcoxon signed rank test and between the group Mann Whitney "U" test were examined.

3. Results

30 subjects recruited for this study with the mean age of patients of experimental group was 33.13 ± 8.305 and mean age of patients in the control group 26.93 ± 12.753 . Hence the variation in the age was not significant. Both genders of subjects were recruited for the study. In the present study the experimental group had 9 males and 6 females and control

group had 11 males and 4 females, (Table1). This proves that study was unbaised. In mime therapy group there is significant improvement reported in both outcome measures within the group (Z=3.477, P=0.001, P<0.05, HBFGS), (T=13.325, P=0.000, P<0.05, SBFGS) and conventional group also significant improvement with inthegroup (Z=3.58, P=0.000, P<0.005, HBFGS), (T=9.244, P=0.000, P<0.05, SBFGS). There is no significant difference in between the group in both outcome measures (U=72.0, P=0.109, P>0.05, HBFGS), (T=1.983, P=0.057, P>0.05, SBFGS) (Table 2) (figure 1 & 2).

4. Discussion

Studies have been done on Mime therapy efficacy in patients with long term facial nerve paresis which shows that mime therapy substantially improves facial symmetry in people with long term facial nerve paresis. Beurskens CH, Heymans PG⁽¹⁰⁾ postulated that to find out the effect of mime therapy on facial symmetry and severity of paresis in people having facial nerve paresis for more than nine months and found that mime therapy of 3months duration improves facial symmetry and reduces the severity of paresis in people with long - term facial nerve paresis. Beurskens CH, Heymans PG⁽¹¹⁾ performed a study to evaluate the positive effects of mime therapy for patients with longstanding (at least 9 months) sequelae of unilateral peripheral facial paralysis and found that stiffness, lip mobility, and both aspects of Facial Disability Index improved substantially because of mime therapy. The cost of treatment is relatively low as along with therapy at physiotherapy set - up, home program is also an integral part of therapy. Mime therapy is also a good choice of treatment for people with long - term facial paresis. This study also showed that significant improvement in the lip mobility might be the eye lip closure exercise is part of mime therapy. According to Kendall (12), facial muscles are called the muscles of expression. The facial nerve, through its many branches, innervates most of the facial muscles. Numerous muscles may act together to create movement or movement may occur in a single area, might be through this principle facial expression exercises are facilitating the facial symmetry and facial function. Massage has an effect on circulation and maintenance of muscle properties. The value of massage is to produce hyperaemia and maintain tonus of the facial muscles. This may have resulted in facial function and symmetry. Different opinions exist concerning the efficacy of massage, but again paucity of significant studies has been published. Massage may be considered to be a form of psychotherapy. Electrotherapy is one of the most controversial subjects in the treatment of peripheral facial nerve paralysis. Mosforth and Taverner reported a controlled trial of the value of galvanic stimulation in the management of 86 Bell's palsy patients. The authors concluded that although no significant advantage could be demonstrated by the use of galvanic stimulation the presence of contracture was not related to the mild electrical treatment. The physiological effects of electrical stimulation at cellular level is it increases the cell permeability, excitation of nerve and protein synthesis; at tissue level it its causes contraction of the muscles and helps in tissue regeneration; and, at segmental level it helps in muscle pumping action to increase circulation and lymphatic activity. Studies have documented that electrical stimulation

has an effect on facial muscles as to restore muscle induce contraction of the denervated muscles ^{(14).}

For many years facial exercises ⁽¹⁵⁾ have been recommended for peripheral facial nerve palsy patients with both complete and incomplete paresis. The patient should stand in front of a mirror and watch the face while raising the eyebrows, gently closing the eyes, wrinkling the nose, whistling, blowing out the cheeks and grinning. These facial exercises should be performed twice a day. Although the effect of facial exercises has not been statistically evaluated; patients appreciate the exercises to a very great extent. This current study proves that mime therapy is effective in Bell's palsy patients and us accepting the experimental hypothesis.

Limitations of current study was subjects could not be followed up for longer period of time, study conducted only in acute cases and duration of the study prolonged i. e., more than 1 year. Future research should aim with larger sample size and with longer follow - up period are recommended and the amount of force applied during massage and stretching is a parameter of further research.

5. Conclusion

Present study results have shown that Mime therapy as well as Conventional therapy both is effective for the management of Bell's palsy. In both groups were having the significant improvement on the facial function and facial symmetry. This study proves that mime therapy is a suitable adjunct to the management of Bell's palsy patients.

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Table 1 Baseline	demographic data
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Gender (male/	Mime therapy group	Conventional group
female), n	9/6	10/5
Age, Yrs	33.13 ± 8.30	26.93±12.75
Onset of Duration	7.53±4.12	8.73±4.52
Side (right/left)	7/8	8/7

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Table 2: Base line, 3 weeks post treatment and changes for facial function and facial symmetry					
Group	Baseline	3 weeks post treatment	Within the group avg improvement	Between group	
HBFGS Mime group	3.6±0.98	1.67±0.72	1.93 (Z=3.47, P=0.001)	U=72.0, P=0.109, P>0.05	
Conventional group	3.6±1.04	2.13±0.83	1.53 (Z=3.58, P=0.000)		
SBFGS – RS Mime group	2.00 ± 4.14	0.00 ± 0.00	2 (T=1.87, P=0.000)	T=1.236, P=0.227, P>0.05	
Conventional group	4.0±4.70	0.00 ± 0.00	4 (T=3.292, P=0.00)		
SBFGS – SVM Mime group	57.8±11.3	85±14.7	27.2 (T=11.91, P=0.00)	T-2 500 B-0 105 B 05	
Conventional group	58±11.7	76.4±15.6	18.40 (T=7.31. P=0.00)	1=2.390, P=0.105, P>.05	
SBFGS – SK Mime group	3.06 ± 1.98	0.73±1.03	2.33 (T=6.04, P=0.00)	T-0.725 D-0.460 D 0.05	
Conventional group	3.4±2.13	1.53 ± 1.59	1.93 (T=5.03, P=0.00)	1=0.755, P=0.469, P>0.05	
SBFGS Mime group	51.8 ± 16.61	84.3±15.59	32.53 (T=13.32, P=0.00)	T-1.08 D-0.105 D>0.05	
Conventional group	50.2±17.77	75.46±16	25.26 (T=9.24, P=0.00)	1–1.96, F–0.103, F>0.03	







Figure 2: Pre - test and post - test means of experimental group and control group of SBFGS