



EFFECTIVENESS OF ELECTRICAL STIMULATION ALONG WITH MIRROR THERAPY AMONG ACUTE BELL'S Palsy: A CASE STUDY

Neurophysiotherapy

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ABSTRACT

Background and Objectives: Bell's palsy is an acute-onset peripheral facial palsy and is the commonest cause for lower motor nerve fiber palsy¹. Facial resting symmetry and expressions are determining factors of facial attractiveness & being a marker of good health¹. The objective of this study is to illustrate the effect of the mirror therapy along with the electrical stimulation in improving the facial symmetry in acute Bell's palsy¹. Hence the need arises to evaluate the effectiveness of the mirror therapy along with electrical stimulation on the recovery in Bell's palsy patients^{1,2}. **Aim:** To study the effect of mirror therapy along with electrical stimulation for recovery in patients with acute Bell's palsy. **Method :** 21 year male with history of ear pain and cold before one week when initial physiotherapy evaluation was done but at that time no symptoms were present at that time after 3 days he presented with complaint of left facial drooping and unable to closing left eye and weakness. **Result:** The results have shown that the physiotherapy sessions obtained the effect of physiotherapy management with electrical muscle stimulation with mirror therapy in the treatment of Bell's palsy. **Conclusion:** The effect of physiotherapy management with Electrical Muscle Stimulation (EMS) and taping for Bell's palsy outcome improved.

KEYWORDS

Bell's palsy, Facial Disability Index, Mirror Therapy, Physiotherapy, Electrical Stimulation.

INTRODUCTION

Bell's Palsy is named after the Scottish anatomist, Sir Charles Bell (1774-1842), who was the first to describe it. Bell's Palsy is the most common acute idiopathic disorder that is associated with peripheral nerve palsy affecting the facial nerve, which supplies all the muscles of facial expression. The annual incidence of Bell's palsy is 15 to 30 per 100,000 persons, inversely affecting both genders. Bell's palsy has been described in patients of all ages, with peak incidence noted in the 40s.¹ The incidence is lowest in children under 10 years old, increases from the ages of 10 to 29, remains stable at the ages of 30 to 69, and is highest in people over the age of 70. It occurs more commonly in patients with diabetes, hypertension and an increased incidence in women during the third trimester of pregnancy.^{2,3} The etiology of Bell's palsy remains obscure and there are no clinical or laboratory tests that can diagnose the disease.

Difficulty in closing the affected side-eyes, facial deviation to the unaffected side, difficulty in drinking, eating, and speaking are the common problems associated with acute phase of bell's palsy.⁵ Psychological problems associated with facial appearance is the main factor that affects the individual personally in any phase of bell's palsy.⁶ Thus, it causes functional deficits, affects facial expressions, and impacts the the individual's quality of life.⁷ The proper evaluation and treatment are compulsory for negotiating the most ideal rehabilitation of facial nerve function. Bell's palsy patients may be advantaged by the specific physiotherapy treatment that will ameliorate the physical functions as well as the psychosocial well-being.⁸ Bell's palsy is constantly treated with patient education and various physical therapy interventions which includes kinesiotherapy, massage therapy, cryotherapy, and electrotherapy.⁹ Since 1980, mime therapy, a combination of mime and physiotherapy, has been offered in patients with sequelae of facial paralysis. The goal of mirror therapy is to ameliorate symmetry of the face both at rest and during movement, contemporaneously controlling synkinesis; in the process, patients will look and feel better and have lower problems with eating, speaking, drinking and social integration.¹⁰ Mirror therapy includes auto-massage, relaxation exercises, co-ordination.

Paolucci Teresa et al. suggested that the mirror therapy, and its

association with mirror imagery inspired the patient to imagine the movement before executing it, and allows to perceive the improved movement in the facial paresis over visual feedback by viewing the reflection of the intact face in place of the facial palsy sensory feedback, in which the face moved symmetrically.^{8,9,10}

Methodology:

21 year male with history of ear pain and cold before one week when initial physiotherapy evaluation was done but at that time no symptoms were present at that time after 3 days he presented with complaint of left facial drooping and unable to closing left eye and weakness. So after that the physiotherapy evaluation further consist of a qualitative analysis of his resting facial posture and neurological examination of the head and face, which revealed hypo-esthetic response to pinwheel testing in the three terminal branches of the left trigeminal nerve (V1) ophthalmic, (V2) maxillary and (V3) mandibular. To assess self-reported disability at baseline and to monitor treatment progress, the patient will complete the Facial Disability Index (FDI). The FDI is designed to provide the clinician with information regarding the disability as well as related social and emotional well-being of the patient. The scores range from 0 (complete paralysis) to 100 (normal facial function). The FDI has shown to be reliable and valid as a clinical instrument and has been shown to accurately demonstrate the relationship between impairments, disability, and psychosocial status.

Intervention:

Before intervention we will taking baseline data using facial disability index from the physical medicine point of view, the type of ES should depend on the pathology of the facial nerve. If there is no electrophysiological signs of muscle denervation (i.e. the facial nerve lesion is focal demyelination or neurapraxia), faradic stimulation or ES using 0.1-1 ms duration pulses delivered at a frequency of 1-2 pulses/s or more (e.g. transcutaneous electric nerve stimulation, TENS) may be given for 50-200 contractions/session, 2 sessions/ week for 4 weeks. Interrupted galvanic stimulation (IGS) of 100 ms rectangular pulses may be given at a rate of 1 pulse/s for 30-100 contraction/session. During each session, ES should be stopped once muscle fatigue occurs (i.e. it is not recommend to increase current intensity once fatigue occurs).

Following electrical stimulation the mirror therapy given the patient was sat upright, maintaining good and proper posture. The mirror had kept at the patient's eye level. The mirror should be opened to a right angle with the nose touching the outer edge of mirror. The participant looked into the mirror with both eyes open and only the unaffected half of the face reflecting back. The participant should see the unaffected side of the face twice reflecting, giving the appearance of full-face reflection. After that the patients were requested to perform the following therapist commands:

- 1) Think about something surprising and raise gently the eyebrows. Release.
- 2) Think about something frustrating and gently frown the eyebrows. Release.
- 3) Think about something disgusting and wrinkle your.

Intervention protocol will give 2 sessions / week for 4 weeks. After 4 weeks of intervention again FDI will taken and illustrate the effectiveness of the intervention.

RESULT:

Table 1: Patient Characteristic.

Patient	Age	Gender	Clinical Manifestation	First Symptom	Imaging	Treatment	Outcome
1	21 year	Male	Left side	• Ear pain & cold • left facial drooping • unable to closing left eye and weakness	MRI normal	Electrical stimulation (ES) Mirror Therapy	Complete

Table 2: Physical Therapy Schedule.

Date of Treatment	Frequency of Sessions	No. of Days	Total Sessions
30/03/2024 to 30/04/2024	2 sessions / week for 4 weeks	28 Days	8 Sessions

The result show that the physiotherapy sessions obtained the effect of physiotherapy management Electrical stimulation (ES) and Mirror Therapy in treatment of bell's palsy highly responded to recovery. (Table 1 & 2).

DISCUSSION

The most prevalent neurological disorders that affect cranial nerves are facial nerve paralysis^{2,3,4}. This results in a signature facial distortion^{1,2,3}. This results in a signature facial distortion^{4,5}. This occurs as a result of facial expression loss^{6,7}. It is most often caused by a benign inflammatory disorder known as Bell's palsy, which is self-limiting with facial muscle fatigue developing over hours to days, the onset is abrupt^{1,2,3,4,7,8}. However, etiology is thought to be correlated with inflammation, nerve compression and autoimmune dysregulation, and it is still poorly understood⁴. The patient obtained details about the disease and its prognosis after a complete examination by the physiotherapist^{9,10}. In order to deal with her dry eye, the physiotherapist offered advice to we put eye patch and to take breaks from the screen^{4,8,9}. To help restore normal facial muscle function electrical stimulation and mirror Therapy were given¹⁰. Electrical stimulation stimulate the individual muscles and function as well as facial asymmetry^{2,3}. Eventually, after 4 months of therapy, the facial weakness of the patient finally vanished without complications and the prognosis was strong. As this report highlight positive impact of physiotherapy^{6,7,8}. Mirror therapy by seeing the unaffected face perform the exercises in normal manner for the affected side will lead to an increased activity of motor command pathways from the unaffected region which is utilized to supplement the damaged region. As per the literature with the use of Mirror book therapy the patients are allowed to visually appreciate the return of muscle activity^{3,5,9}.

CONCLUSION

We aimed in this present case study to evaluate the effect of mirror therapy with electrical stimulation for Bell's palsy outcome improved as well as the electrical stimulation improves the functional recovery and facial symmetry also return of muscle activity. FDI score were used for before and after 4 week of intervention. So we concluded that electrical stimulation showed greater improvement functional recovery and facial symmetry also return of muscle activity. It

improves the patient quality of life as well.

Compliance with ethical standards

Conflict of interest - The authors declare that they have no conflict of interest.

Abbreviations:

FDI: Facial Disability Index

ES: Electrical Stimulation

MRI: Magnetic Resonance Imaging

BP: Bell's palsy

MT: Mirror Therapy

QOL: Quality Of Life

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