

Effectiveness of Facial Nerve Stimulation with Kabat Technique in Bell's Palsy Patients

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ABSTRACT

Background: Bell's palsy, also known as idiopathic facial paralysis. It is one of the most common neurological disorders of the cranial nerves. Bell's palsy is usually a type of temporary sudden paralysis that causes weakness of the muscles of face on one side. Rarely, it can affect both sides of the face. The etiology is unknown and therefore the scientists believe that a viral infection such as common cold sore virus, herpes simplex, etc could be the cause. It is also been associated with herpes, mumps, influenza, chronic middle ear infection, lymes disease, tuberculosis, trauma such as skull fracture, facial injury, frozen or damaged facial nerve. Electrical stimulation uses a small amount of electricity to activate the muscle of face. This causes the facial muscles to twitch as if electrical impulses from your brain activated them. Kabat rehabilitation is a type of motor control rehabilitation technique based on proprioceptive neuromuscular facilitation.

Methods: It was a randomized clinical trial consisting 30 participants (males and females) 15 in each group, with Bell's palsy of non-traumatic origin. Group A received Electrical stimulation, facial exercises and Group B received Electrical stimulation, Kabat technique, facial exercises for 15 days, and one session per day.

Results: The results suggest that Group B had significant higher score at House Brackmann Scale than Group A.

Conclusions: Both group A and group B showed significant results and displayed efficient improvement in facial symmetry after 15 days of treatment. KABAT technique with electrical stimulation and facial muscle exercises is more effective in improving facial function and reducing facial disability.

Key words: Bell's palsy • Physical rehabilitation • Kabat • House-Brackmann grading system.

INTRODUCTION

Bell's palsy is a neuropathy of the peripheral seventh cranial nerve, usually resulting from traumatic, compressive, infective, inflammatory or metabolic abnormalities. However, in many cases no etiology is identified and the eventual diagnosis is idiopathic. [1] Although viral infections, trauma, surgical interventions, diabetes, local infections, and congenital, toxic, tumoral and immune diseases are being investigated in the etiology of Bell's

palsy. [12] Bell's palsy can be defined as acute peripheral facial nerve palsy usually of unknown cause. [2] The condition is named after Dr. Charles Bell, who, in 1821, described complete facial paralysis after injury of the stylomastoid foramen. [1]

Bell's palsy is unilateral weakness or paralysis of the face due to acute peripheral facial nerve dysfunction with no readily identifiable cause and with some recovery of function within six month. [5,6,7] It is an acute disorder of the facial nerve, basically

the lower motor neuron lesion in origin, which may begin with symptoms of pain in the mastoid region and produce total or partial paralysis of movement of one side of the face. [8] The onset of Bell's palsy is sudden and usually evolves rapidly during a period of 1 to 7 days, but it may also progress more slowly, reaching maximum weakness up to 1 to 3 weeks after onset. [9,10] Recurrence rate is about 10% that can present on the same or the contralateral side. [11]

Bell's palsy is classifying in accordance with House-Brackmann score into 6 grades, from normal to total paralyzed. [13] Treating Bell's palsy in early period with a multidisciplinary approach is important for speeding the recovery process up. In addition to medical therapy, thermal heat modalities, electrical stimulation, exercise and massage are physical therapy methods of which the effectiveness were shown. [14]

The purpose of this study is to assess the contribution of the KABAT technique and its impact on recovery process in Bell's palsy cases.

Pathophysiology: Bell's palsy induces a wide range of facial muscle movement dysfunction from mild paresis to total paralysis. Individual patients display a spectrum of symptoms: some maintain reduced movement throughout the course of the disorder while others rapidly become totally paralyzed over a 24-hour period.

The pathophysiology of the neural injury is suspected to be due to edema within the nerve induced by a viral infection. [1] Acute inflammation and edema of the facial nerve are thought to lead to entrapment of the nerve in the bony canal (especially in the labyrinthine segment), which leads to compression and ischemia. [3] Many viruses, such as HIV, Epstein-Barr virus and Hepatitis B virus have been suspected in initiating this inflammation, but herpes simplex virus (HSV) is the most.

According to one hypothesis, HSV, dormant in the geniculate ganglion cells,

becomes reactivated and replicates, causing inflammation, primarily in the geniculate ganglion and in the labyrinthine segment of the facial nerve. [1] These inflammatory events (evident on magnetic resonance imaging) result in entrapment and ischemia, which lead to neurapraxia or degeneration of the facial nerve distal to the meatal foramen. [3]

Bell's palsy is commonly treated by various physical therapy strategies and advices. Physiotherapy treatment for Bell's palsy includes kinesiotherapy, massage therapy, cryotherapy and electrotherapy. Electrical stimulation (ES) of paralyzed muscles has long been a popular intervention for patients with Bell palsy. [4]

MATERIAL AND METHODOLOGY

30 Subjects with Bell's palsy willing to take treatment for 15 days were recruited for study. The subjects were screened and were put in either of the group A (Electrical stimulation and facial muscle exercises) and group B (Kabat technique, Electrical stimulation and facial muscle exercise) by randomized control trial. A written informed consent was taken from each participant.

Inclusion criteria were both male and female, Age between 20 -70 is included and Patients diagnosed to have Bell's palsy. Exclusion criteria were Psychiatric illness, pregnant women and Hypertensive patients.

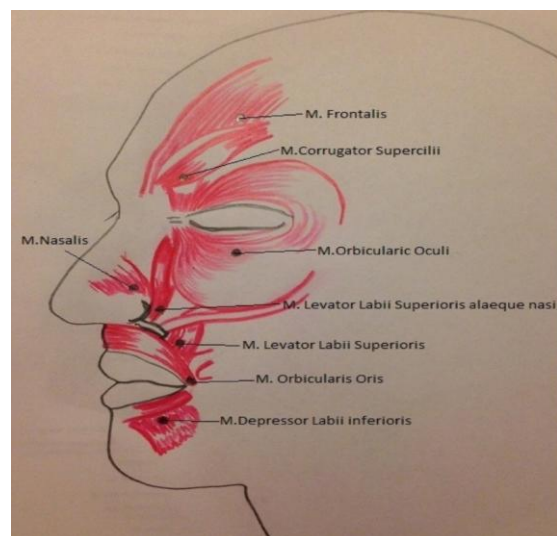


Figure 1: Motor stimulation points in face. [15]

Both Groups were treated with Galvanic current to stimulate the facial muscles and faradic current was used for each facial nerve trunks. Mode with 100 millisecond intermittent galvanic current for motor point treatment, 30 times as 3 rounds to each point, and at a current intensity as to obtain minimal contraction. 30 contractions were given to each muscle in 3 sessions and 10 contractions were given to each facial nerve trunk (figure 1).^[15] Stimulation was given to patients once a day. The study setting was in Department of PMR, PSG hospitals, Coimbatore.

Ethical Clearance: The study followed the ethical standards of institutional human ethics committee, PSG IMS&R. [(Ref. no. PSG/IHEC/2018/Appr/Exp/164) (project No: 18/072)].

Outcome Measure: A both the Groups were evaluated pre and post treatment program using House-Brackmann Scale (HBS) to assess facial symmetry.

House-Brackmann Facial paralysis grading system.^[16]

Grade	Description	Characteristics
I	Normal	Normal facial function in all areas
II	Mild dysfunction	Slight weakness noticeable on close inspection; may have very slight synkinesis
III	Moderate dysfunction	Obvious, but not disfiguring, difference between 2 sides; noticeable, but not severe, synkinesis, contracture, or hemifacial spasm; complete eye closure with effort
IV	Moderately severe dysfunction	Obvious weakness or disfiguring asymmetry; normal symmetry and tone at rest; incomplete eye closure
V	Severe dysfunction	Only barely perceptible motion; asymmetry at rest
VI	Total paralysis	No movement

STATISTICAL ANALYSIS AND RESULTS

30 subjects with Bell's palsy, above the age 15 years were taken. Out of 30 subjects, Group A had 7 males, and 8 females and Group B had 8 males, and 7 females. The mean age of the participants in Group A was 41± 21.458 and in Group B was 40 ± 17.397. There was no significant difference between the mean ages of the participants in both groups. (P= 0.8968).

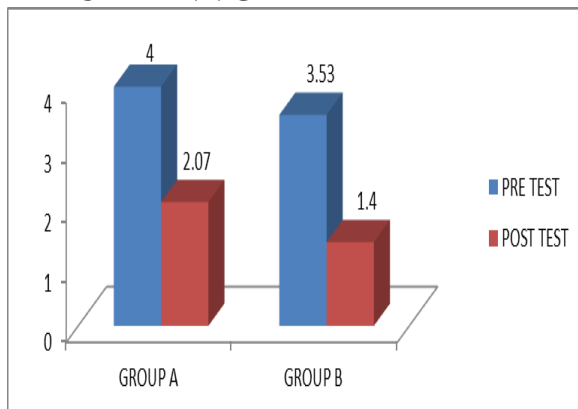
INDEPENDENT "t" TEST VALUES FOR BELLS PALSY

OUTCOME MEASURES	MEAN DIFFERENCE	"t" VALUE	"p" VALUE
House Brackmann Scale (HBS)	0.67	2.98	P<0.05

PAIRED "t" TEST VALUES FOR BELLS PALSY

GROUP	MEAN	MEAN DIFFERENCE	STANDARD DEVIATION	"t" VALUE	"p" VALUE
GROUP A PRE TEST	4.00				
POST TEST	2.07	1.93	0.59	12.61	P<0.05
GROUP B PRE TEST	3.53				
POST TEST	1.40	2.13	0.64	12.91	P<0.05

MEAN VALUES OF HOUSE-BRACKMANN GRADE



DISCUSSION AND CONCLUSION

The aim of the study was to find the effectiveness facial nerve stimulation with Kabat technique in Bell's palsy patients. This study compared the effectiveness of Kabat technique with electrical stimulation against facial muscle exercise and electrical stimulation. 30 subjects with Bell's palsy, age between 20-70 years were taken. Out of 30 subjects, Group A had males, and females and Group B had males, and female. Both group A and group B showed significant results and displayed efficient improvement in facial symmetry after 15 days of treatment but Kabat technique with electrical stimulation and facial muscle

exercises is more effective in improving facial function and reducing facial disability.

The study "Effectiveness of facial nerve stimulation with Kabat technique in Bell's Palsy Patients." was conducted to compare the two treatments and find out the best which improves the facial expression as early as possible. Expressions in Bell's palsy become the major limiting factor for subjects. It causes social impairment and also functional impairments. It affects self-esteem. This study shows significant difference in the pre and post treatment values in both the groups.

Evaluation of the actual efficacy of the different treatments of BP is generally biased by several factors, such as the high likelihood of complete spontaneous recovery, the initial time of treatment and steroid administration that is generally given in all cases.

It is possible to conclude that, when Kabat rehabilitation is associated with electrical stimulation and facial muscle exercise treatment in the case of severe BP, affected subjects may be likely to have a faster and better recovery than those in whom only medical treatment is applied.

It would therefore be worthwhile to always include this type of physical rehabilitation in patients with BP, especially in the most severe cases which may carry the risk of disfiguring facial sequelae.

However the individual rates of recovery in the experimental group were higher than that of the control group and this suggests clinical significance.

Suggestions for future study

Based on the outcomes of this study, the following changes are suggested, The study can be extended to a large sample size.

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