ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 11, Issue, 07, pp. 48509-48512, July, 2021
https://doi.org/10.37118/ijdr.22381.07.2021

REVIEW ARTICLE OPEN ACCESS

EFFICACY OF FACIAL SPLINT IN IMPROVING FACIAL SYMMETRY IN THE MANAGEMENT OF BELL'S PALSY AMONG COMMUNITY DWELLERS

***Shyni, M.**

Assistant Professor, Department of Physiotherapy, School of Medical Education, Centre for Professional and Advanced Studies (CPAS) Established by Government of Kerala, Kottayam 686008, Kerala, India

ARTICLE INFO

Article History:
Received 29th April, 2021
Received in revised form
12th May, 2021
Accepted 08th June, 2021
Published online 25th July, 2021

Key Words:

Bells palsy, Facial splint, Facial symmetry, House- brackmann facial nerve Grading system (HBFNGS).

****Corresponding author: Shyni, M.,***

ABSTRACT

Introduction The current conservative therapy techniques for Bell's palsy focus on improving facial muscle circulation, reducing inflammation, and maintaining facial muscular characteristics, with little emphasis on the biomechanical element of the illness. **Objective:** to find out the efficacy of facial splint in improving facial symmetry in the management of Bell's palsy among community dwellers. **Method:** An experimental research was undertaken at the physiotherapy department of Boss hospital in Coonoor, The Nilgiris. A total of 40 individuals with HBFNGS grade v Bells palsy were divided into two groups. The first group (n=20) received conventional treatment, whereas the second group (n=20) received conventional treatment with facial splinting. Over the course of three weeks, the therapy was administered for 18 days. Prior to and after the treatment program, the result was assessed by HBFNGS. **Result:** The experimental group exhibited a statistically significant improvement in facial symmetry after 18 days of facial splinting technique combined with conventional physiotherapy. **Conclusion:** Patients with Bell's palsy who received a facial splinting technique in addition to conventional therapy had a statistically significant improvement in facial symmetry compared to the control group. As a result, face splinting, in conjunction with conventional physiotherapy, is beneficial in the management of Bell's palsy.

Citation: **Shyni, M., *2021.*** "Efficacy of facial splint in improving facial symmetry in the management of bell's palsy among community dwellers", *International Journal of Development Research*, 11, (07), 48509-48512.

INTRODUCTION

Dr. Charles Bell, a Scottish physician in Edinburgh, was the first to describe Bell's palsy in 1821. It's an LMN lesion that causes facial expression muscles to become paralyzed. In most cases, just one side of the face is affected. It's an idiopathic condition in which the 7th cranial nerve, the facial nerve, is compromised, resulting in LMN type unilateral facial weakness or paralysis. The non-suppurative inflammation of unknown etiology of the facial nerve within its canal above the stylomastoid foramen is thought to be the cause of acute facial paralysis; risk factors include history of exposure to extreme cold, ear infection, Herpes zoster infection, upper respiratory tract infection, and idiopathic causes. (Allan et al, 2005). Bell's palsy affects 20-30 people per 100,000 in India, accounting for 60-70 percent of all unilateral peripheral facial palsies. Both sexes are equally affected, and it can strike at any age, with the median age being 40. The risk is lowest in children under the age of ten and highest in individuals over the age of 70. Both the left and right sides of the face are affected. (Ahmed et al, 2018). The conservative therapy techniques for Bell's palsy primarily focus on improving facial muscle circulation, treating inflammation, and maintaining facial muscular characteristics, with the biomechanical component of the condition receiving little attention. The splinting approach is based on neuro muscular re-education, neurophysiology, and biomechanical concepts. It claims that irradiation can strengthen or assist weak or paralyzed muscles. Traditional physiotherapy treatments such as ultrasound, IRR, electrical stimulation, face massage, facial muscle strengthening exercises, mouth hygiene, and eye hygiene have been shown to be successful in treating Bell's palsy, but that take a long time to cure the patient. Because the facial splinting approach minimizes the time of treatment, the cost of treatment also decreases, making the facial splint a particularly cost-effective instrument for restoring normalcy to the patient. (Glady et al, 2006; Darcy et al, 1990). Muscles that are held in a stretched position all of the time have a lower chance of returning to normal muscle activity, so if the weak muscles are supported by an appropriate and well-executed splint, they will be able to return to normal function sooner and avoid the development of a substitution pattern. Because the splint is inexpensive, it may be obtained at a minimal cost, making it accessible to even the poorest of individuals. People of any comprehension level may quickly learn the strategies for using it, as it being so basic to use. The splint has no adverse effects, and the shortened recovery time allows the patient to return to his or her usual routine as soon as possible. The purpose of this study was to see how effective a facial splint is in improving facial

symmetry for the management of Bell's palsy among community-dwellers. (Léonard et al, 2008; Naidn et al, 2000)

METHOD

The research used a pre-test, post-test, control group, and experimental group design. 40 subjects with diagnosed cases of Bell's palsy aged between 30-40 years who fulfilled the inclusion criteria were recruited randomly into two groups of 20 each by convenient sampling. Consent was obtained from them prior to the study. Baseline evaluation was performed for the patients referred by neurologist. Assessment was taken for all 40 patients using HBFNGS on the first and the last day of treatment. The subjects were divided into two groups, control group (group A) and experimental group (group B) and matched on the basis of age, sex, severity and grade (grade V according to HBFNGS) of involvement. Inclusion criteria's comprised: 30-40 years old subjects of either gender diagnosed with idiopathic unilateral facial paralysis (Bell's palsy), Grade V of Bell's palsy according to HBFNG, Acute onset (1—3 weeks), Non traumatic onset and who showed no other neurological deficit. The non co-operative patients; subjects with UMN lesions or diagnosed with facial palsy due to tumor; subjects with skin infections and open wounds; allergic to external appliances and with a history of uncontrolled diabetes were excluded from the study. The outcome was based on measurement of facial symmetry using House-Brackmann facial nerve grading scale (HBFNGS). The treatment schedule consisted of 3 weeks with pre- test evaluation was done on the day prior to treatment and post- test evaluation done on the following day after 3 weeks. A single treatment session of control and experimental group was 40 and 45 minutes respectively. The treatment was given once daily for six days a week for a period of 3 weeks for both the groups, with a total of 18 days. (Coulson et al, 2005; Murthy et al, 2010).

Procedure

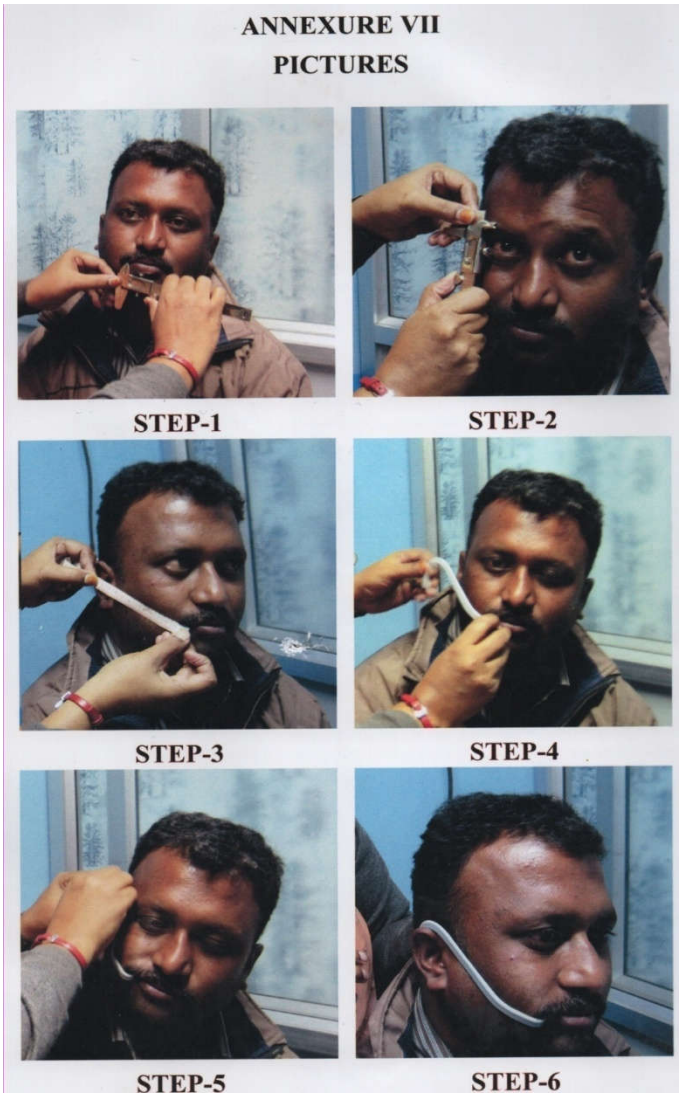
Control Group (Group A)

Conventional physiotherapy: The Group A patients received the following treatment during the 40 minutes session; however, an extra 5 minutes was taken on the first day in order to instruct the patient about the precautions to be taken and to demonstrate the home exercises:

1. IRR for 10 minutes by keeping the lamp at a distance of 60 cm
2. Intermittent galvanic stimulation for 15 minutes, one set of 90 contractions for each muscles- Corrugator supercilii, Procerus,Orbicularis oculi, Buccinator,Levator labii superioris alaequae nasi, Levator labii superioris, Levator anguli oris, Depressor anguli oris, Depressor labii inferioris, Menlalis
3. Facial exercises for 15 minutes, 20 repetitions each. Raise eyebrows, Bring eyebrows together, Closing and opening the eye, Sniffle, wrinkle nose, flair nostrils, Blow air, Raise and protrude lips, Smile and whistle ,Compress lips together
4. Home advice and exercises- The patients were encouraged to perform all of the exercises in front of the mirror at home, to practice good oral hygiene, and to clean their mouths and teeth on a regular basis to avoid food collection between their teeth. Patients were instructed to clean their eyes often with antiseptic washes and ointment, and to wear dark sunglasses when outside in the sun. It was also recommended that the patients avoid being exposed to dusty conditions. (Carien et al, 2004; Devriese et al, 1998)

Experimental Group (Group B)

Participants in Group B received a systematic and sequential approach to face retraining using a facial splinting technique protocol in addition to the conventional treatment offered to subjects in Group A. The patient who was to be treated was seated in a comfortable position. Cotton wool and lukewarm water were used to clean the treatment area (splinting region). The measurements were taken in accordance with the HBFNGS. According to HBFNGS, patients with grade V Bell's palsy have an asymmetrical facial appearance at ease, with no movement of the forehead, partial eye closure, and minimal lip movement while moving. For grade V, the measurement ranges from 1/8 to 2/8. By using the fixed jaw of a vernier caliper, measurements were collected by placing it at the angle of the mouth on the affected side. The patient was requested to deviate his mouth as much as he could towards the affected side, and the vernier caliper's moveable jaw was scrolled along while retaining it at the end point of mouth deviation. The application was carried out as follows: the affected side of the mouth was first cleansed with cotton wool and warm water. The hooked end of the splint was then put at the angle of the mouth, and a small tug was used to bring the mouth into a symmetrical position, before the other end of the splint was hooked onto the same side's ear. The entire procedure was carried out while the patient was at rest. Patients were required to attend physiotherapy sessions six days a week, with the splint tension increasing with each appointment. The patients were instructed to wear the splint as much as possible, except when eating and receiving physiotherapy treatment. The session lasted 45 minutes, with 40 minutes dedicated to conventional physiotherapy and the final 5 minutes dedicated to the facial splinting technique. (Léonard et al, 2008). SPSS software was used to analyze the data (version 17). The value of Alpha was set to 0.05. Wilcoxon test was used to find homogeneity for base line and outcome variable within the group, and Mann-Whitney test was used to find homogeneity for base line and outcome variable between the groups. Descriptive statistics were used to find mean and standard deviation (SD) for demographic and outcome variables.



RESULT

Table 1 depicts the age distribution of the control and experimental groups. The mean age of subjects in control and experimental group found to be 35 years with a SD of 2.31699 and 36 years with a SD of 2.36198 respectively.

Table 1. Demographic representation of age wise distribution of study groups

Group	Age	
	Mean	Sd
Control group	35	2.31699
Experimental group	36	2.36198

Table 2. Gender of the patients in the control and experimental groups

Group	Gender	
	Male	Female
Control group	10	10
Experimental group	10	9
Total	20	20

Table 3. Analysis of pre HBFNGS scores of control and experimental groups

Groups	N	Sum of rank	Mean rank	U	Z	Significance level
Control group	20	430.00	21.50	180.000	0.721	0.471
Experimental group	20	390.00	19.50			

Table 4.Analysis of post HBFNGS scores of control and experimental groups

Groups	N	Sum of rank	Mean rank	U	Z	Significance level
Control group	20	241.00	12.05	31.00	4.752	0.000
Experimental group	20	579.00	28.95			

Table 5. Analysis of pre and post HBFNGS of control group

	N	Mean	SD	Sum of Ranks		Mean of Ranks		Z	Significance level
Pre Test	20	0.325	0.11754	Negative	Positive	Negative	Positive	3.932	0.000
Post Test	20	0.70	0.26408	0.00	190.00	0.00	10.00		

Table 6. Analysis of pre and post HBFNGS of experimental group

	N	Mean	SD	Sum of Ranks		Mean of Ranks		Z	Significance level
Pre Test	20	0.30	0.10260	Negative	Positive	Negative	Positive	4.002	0.000
Post Test	20	1.50	0.42146	0.00	210.00	0.00	10.50		

Table 2 shows the gender demographics of the control and experimental groups. The control group included ten males and ten females, whereas the experimental group comprised eleven males and nine females. The mean rank and sum of rank for the control group were 21.50 and 430.00, respectively, as shown in table 3. Similarly, the mean rank and sum rank for the experimental group were 19.50 and 390.00, respectively. The U value was 180.00, the Z value was 0.721, and the significance level was 0.471, which was not statistically significant at the 5% level of significance, indicating that there was no significant difference in the pre-HBFNGS scores of the two groups. Likewise, the mean rank and sum rank for the control group are 12.05 and 241.00, respectively, according to table 4. The mean risk and sum risk for the experimental group were 28.95 and 579.00, respectively. The U value was 31.000, the Z value was 4.752, and the significance level was 0.000, which was statistically significant at the 1% level, indicating a significant difference between the post HBFNGS scores of the two groups at the 1% level, with the experimental group's post HBFNGS score being better than the control groups. Table 5 demonstrates that the control group's mean pre-test score and SD were 0.325 and 0.11754, respectively, whereas the control group's mean post-test score and SD were 0.70 and 0.26408, respectively. The Z value obtained was 3.923, and the significance level was 0.000, which was statistically significant at the 1% level, indicating a significant difference between the pre and post HBFNGS values. Table 6 reveals that the experimental group's mean pre-test score and SD were 0.30 and 0.10260, respectively, whereas the experimental group's mean post-test score and SD were 1.50 and 0.42146, respectively. The Z value obtained was 4.002, and the significance level was.000, which was statistically significant at a 1% level of significance, indicating a significant difference between the pre and post HBFNGS values. The post-HBFNGS results were superior to the pre-HBFNGS results.

DISCUSSION

The research was an experimental research which aimed to study the effectiveness of a facial splint in enhancing facial symmetry in people with Bell's palsy among community dwellers. 40 individuals with Bell's palsy who met the inclusion criteria, between the ages of 30 and 40 were randomly assigned to two groups of 20 patients each. In both groups, the subjects were almost the same age. The control group had 10 males and 10 females, whereas the experimental group had 11 males and 9 females. Both the control and experimental groups underwent conventional physical treatment, which included IRR, intermittent galvanic stimulation for facial muscles, facial exercises, home instructions, and eye hygiene techniques. The experimental group received a systemic and sequential approach to facial retraining utilizing a facial splinting technique protocol in addition to traditional physical therapy. HBFNGS was utilized as an outcome measure. The pre and post test score of HBFNGS of the control and experimental groups exhibited significant difference at 1 percent level, according to statistical analysis utilizing Mann Whitney 'U' test and Wilcoxon signed rank test. There was no significant difference between the pre HBFNGS values of the control and experimental groups because the pre HBFNGS scores of the control and experimental groups were not statistically significant at the 5% level. The experimental group's post-HBFNGS scores were higher than the control group's. The alternate

hypothesis that "conventional therapy combined with splinting method is more successful than conventional treatment alone in patients with Bell's palsy" was approved based on the results analysis. Despite the fact that both groups were effective, group B had a superior functional recovery in terms of face symmetry and the ability to execute functional tasks including chewing, balloon blowing, and speaking than group A. The splinting technique is a method of facial retraining that is both systematic and sequential. The weak muscles are suitably supported by a well-executed splint, which aids in muscle retraining. Splinting, in general, aids in the retraining of paralyzed facial muscles by maintaining symmetry and facilitating paralyzed muscles, preventing over activity of normal muscles, and acts as a stabilizing mechanism by promoting a desired symmetrical movement pattern that must be repeatedly reinforced before it can be learned. (Croxon et al, 1990; Kate, 2010). Previous research on the management of bilateral Bell's palsy utilizing a novel method of mouth splinting and found it to be effective. The splinting procedure developed by Dr. Vijay Batra (2007) was founded on the concepts of neuro muscular re-education, Neurophysiology, and Biomechanics. Irradiation and temporal and spatial summation can be used to strengthen or assist weak or paralyzed muscles, according to the study, established a thorough therapeutic regimen that included both mirror exercise and splinting. Ross et al. (1991) contrasted two therapy groups to a control group that did not receive any treatment. Following a year of treatment, patients were reevaluated, and it was discovered that using neuro muscular re-education methods to cure face paralysis can successfully minimize sequence after facial nerve damage. Cederwall E et al. (2006) studied the effectiveness of a physiotherapeutic therapy intervention in Bell's palsy. All of the patients improved in terms of symmetry at rest, movement, and function, although those with residual Bell's palsy symptoms appeared to benefit from a specific retraining program. (Vijay et al, 2007; Ross et al, 1991; Cederwall E et al, 2006).

The experimental group's functional performance improved significantly as a result of the current study's findings. The result can be attributed to neuro muscular re-education, neurophysiology and biomechanics. The biomechanical concept describes the vector responsible for performing a movement in order to maximize muscle functioning in the intended direction and avoid asymmetry. The splinting protocol incorporates all of the above principles and serves the primary goal of preventing asymmetry and over-pulling of paralyzed muscles, thereby improving facilitation, reinforcing movement in a graded manner, and maximizing functional use of affected muscles through the use of functional activities. Despite the fact that traditional therapy includes IRR, interrupted electrical stimulation, facial massage, and facial exercises, it does not promote functional reeducation of correct movement patterns, which is the most fundamental aspect of the therapeutic process and lays the groundwork for learning the selective pattern to improve motor functions. A defective motor pattern is the cause of the residual asymmetry. As a result, it can be concluded that a functional splinting technique is more specific and successful in improving facial symmetry in the management of Bell's palsy than traditional therapy alone. (Rob et al, 1999; Philip et al, 1939). The short period of the study is one of the study's shortcomings. The data collecting period was just three months long, and the sample size was modest, with only grade V Bell's palsy individuals aged 30-40 years old included, limiting generalizability. Future studies should be done over a longer period of time with a bigger sample size to determine the efficacy of therapy, according to this study. A regular follow-up program may be incorporated to determine the treatment's long-term effects, and the age group could be expanded.

CONCLUSION

The study shows that combining facial splinting with conventional physical treatment improves facial symmetry in individuals with Bell's palsy more effectively than traditional physical therapy alone. As a result, combining facial splinting with conventional physical therapy can be a successful treatment program for improving facial symmetry in Bell's palsy patients. This aids the patients' recovery and allows them to acclimate to society as quickly as possible. As a result, it can be utilized as a simple and cost-effective supplement to traditional physical therapy in the treatment of Bell's palsy.

REFERENCES

Ahmed Hassan Kamil Mustafa and Ahmed Mohammed Sulaiman. The Epidemiology and Management of Bell's Palsy in the Sudan. Open Dent J. 2018; 12: 827–836.

Allan H. Ropper, Robert H. Brown. Adam's and Victors principles of Neurology. 8th edition Medical Publishing Division. 2005.

Carien H G Beurskens · Peter G Heymans Physiotherapy in patients with facial nerve paresis: description of outcomes;, American Journal of Otolaryngoiogy 2004, 25:394-400.

Cederwall, Elisabet & Fagevik Olsén, Monika & Hanner, Per & Fogdestam, Ingemar. (2006). Evaluation of a physiotherapeutic treatment intervention in "Bell's" facial palsy. Physiotherapy theory and practice. 22. 43-52

Coulson S, Croxon G, Adams Are and O'Dwyer N Reliability of 'Sydnry' and House Brackmann' facial grading systems to assess voluntary movement and synkenisis following facial nerve parasis. Otolaryngology — Head and Neck Surgery; 2005, 132:543-549.

Darcy Ann Umphred, PhD, P.T. Neurological Rehabilitation. 2nd Edition. 1990. The C.V. Mosby Company.

Devriese PP Treatment of seqyelae after facial paralysis: a global approach. Journal of Laryngology and Otology(1998) 112:429-431.

G.Croxon, M May, S J Mester- House Brackmann's facial grading scale. American Journal of Otolaryngoiogy 1990 Jul;11(4):240-6.

Glady Samuel Raj - 2006, Physiotherapy in neuro — conditions. 2nd Edition.

Kate MP - Bell's palsy, an Indian acad neurol 2010 apr 13(2);153

Léonard Bergeron , chung- chih Y u, Single-splint technique for correction of severe facial asymmetry: correlation between intraoperative maxilla mandibular complex roll and restoration of mouth symmetry; plastic Reconstr surg; 2008, Nov 122(5): 1535-1541

Murthy j, sexena A B. Bell's palsy: treatment guidelines. Ann Indian Acad Neurol 2010; 14 Suppl S1: 70-2 .

Naidn D, Scott J, Ong D, 2000 validity and Reliabaility of Vernier Caliper.

Philip Lewin. The preservation of muscle function in Bells palsy, JAMA; June 1939, 112(22):2273.

Rob G peripheral F.P: etiology, diagnosis and treatment. Eur (Switzerland) Jan 1999 page 3-9; vol 41.

Ross B, Nedzelski JM, McLean JA. Efficacy offeedback training in long-standing facial nerveparesis. Laryngoscope 1991; 101: 744-50

Vijay Batra. To study and compare the efficacy of functional dynamic taping protocol / technique over conventional treatment protocol in bell's palsy, The Indian Journal of Occupational Therapy : Vol. XXXIX : No. 2 (August 2007 - November 2007)

****