

Does Nerve mobilization and Electrical Neuromuscular stimulation improves the bells palsy: A case study

Devi Manju

Assistant Professor, Department of Physiotherapy, Lovely Professional University, Phagwara

ABSTRACT

Study design: A case study

Objective: The objective of this report was to determine the improvement of Bell's palsy patient after combination therapy of electrical muscle stimulation and neural mobilisation technique.

Background: Bells palsy is a gradual occurrence of clinical symptoms because of seventh cranial nerve involvement. Steroids are preferred treatment of choice in this condition for initial stages. These medications are dangerous for people having previously existing problems like hypertension, diabetes mellitus, cancer etc.

Clinical Presentation: A 32- year old woman with asymmetry on her right side of her face. The patient was given 20 sessions of neural mobilization and electrical muscle stimulation for 45 minutes, 5 days a week, for 4 weeks along with daily physical therapy. She was assessed with house brackmann facial grading system during initial assessment and compared with the grading at the end of 20th session. Similarly, pain was recorded and compared during the baseline assessment and post assessment of patient. A follow up at 6th week was scheduled.

Results: The patient depicted improvement in both the outcome measures. The scores were measured on house brackmann facial grading system as grade I and 0/10 on Visual analogue scale.

Clinical Relevance: Neural facial mobilisation approach is a new and effective method to improve the flexibility of facial nerve and in recovery of Bell's palsy.

Key words: Bell's palsy; electrical muscle stimulation; neural mobilization; case report.

1. Introduction

Bell's palsy is a problem related to seventh cranial nerve which affects the muscular responsible for expressions of face [1]. The prevalence rate of Bell's palsy is ranging from 15 - 20 in every 100,000 with 40,000 new cases each year [2]. There are various unknown causes; however, facial nerve may get inflammation, compressed or swollen due to infection by herpes virus, injury to the facial nerve, extremely cold weather and because of dental surgical procedures [3]. The signs and symptoms of Bells palsy develop immediately in an hours, which results in weakness on one side of facial muscles, droopy eyelid, angle of the lip alters along with the absence of the naso-labial fold. Many patients show symptoms of vestibular system before representing complete Bell's palsy features. Patient of Bell's palsy has to be examined by visually inspecting the asymmetry of facial muscles, imbalance in facial expressions of both the sides and outcome measures such as House-Brackmann Classification system.

This Classification system of Facial Function is a comprehensive, accurate, and valid classification system for reporting grade of facial nerve function [4]. Neuromuscular stimulation technique and neural mobilisation is a restorative modality in physiotherapy focused at recovering the flexibility of nerve which has been decreased because of an injury to the nerve [5]. There are few researches on combination of Neuro-muscular stimulation with neural mobilization in literature. Thus, this case study is conducted to understand the role of neuromuscular electrical stimulation and facial nerve mobilization in the improvement of patient with Bell's palsy.

2. Case report

A female of 32 years was having right facial asymmetry referred to our clinic with the diagnosis of Bell's palsy. She reported that she felt slight pain 1 day ago in evening and noticed distorted and deviated face towards right side. She informed that she had a dental procedure and the signs and symptoms appeared 1 day before. Her pain was calculated on visual analogue scale as 4/10. While taking history patient has not reported any significant medical history such as hypertension, cardiac problem, viral infection and diabetes. Patient was assessed using house brackmann scale and diagnosed with grade III (moderate dysfunction) obvious weakness asymmetrical, synkinesis, and contracture or hemi-facial spasm, complete eye closure. Dermatomal and myotomal examination was done and it was normal. Tests were performed such as rapid plasma regain, blood glucose, and thyroid function, and radiography, results were in normal limits. Intervention protocol for Bell's palsy was planned in the morning and informed consent was taken from the patient prior to the treatment.

3. Materials and Methods

A 32 year old female diagnosed with Bell's palsy has been selected for the case study. The study was approved by Institutional Ethical Committee and written consent was signed by the patient. A physiotherapy protocol of 4 weeks has been given to the patient. The baseline assessment was done 1 day after the diagnosis. Facial symmetry was recorded after 4 weeks from baseline. A total of 2 outcome measures have been used to assess the progress facial symmetry and reduction in pain of the patient.

4. Outcome measures

4.1.1 House brackmann grading scale- Assessment has been taken by asking the patient to sit comfortably in front of the mirror. Subject was instructed to follow the commands and perform the action while looking at the mirror. Firstly, to look at the mirror and facial asymmetry at rest was noted. It was followed by the command of closure of eyes while sitting erect and looking at the mirror. Later, it was instructed to close the mouth on the affected side with efforts and to wrinkle her forehead. Reading was noted according to the grading system I-IV.

4.1.2 Visual analogue scale for pain- This is a standard measurement to evaluate the level of pain among patients. This scale is made up of straight line which is 10 cm of length denoting values from 0-

10. Values towards 0 mean no pain and values towards 10 means maximum pain. Subject is asked to mark the amount of pain she is feeling at the time of baseline assessment.

5. Physiotherapy treatment protocol

Treatment was started on the same day when the patient has reported and it was conducted for 5 days a week for 4 weeks with 20 total sessions. Single treatment session withstand for 45 minutes. Treatment consisted of combination of electrical modalities, facial muscle tapping along with massage therapy [1, 6]. Massage therapy consisting of tapping, kneading on the facial muscles for 15 minutes [2]. Anode was kept at the posterior part of the neck and cathode was kept at the six different motor points of the seventh cranial nerve for 20 repetitions each with 10 second rest. Stimulation was done manually with the pen electrode. Setting up of an apparatus parameter was done. Electrical muscle stimulator was adjusted by keeping pulse duration of 300 ms and frequency of 60 Hz. Electrical muscles stimulation was given for 15 minutes in each session.

Re-education for facial neuro-musculature was done by allowing the patient to sit next to mirror, and instructions were given for lifting the eyebrows, smiling in front of mirror, clenching the teeth and blowing air in the mouth for 15 times each [4]. Therapist kept the index finger and thumb at the lower part of ear to provide the facial nerve mobilisation. Traction was given by placing the thumb towards the external auditory meatus opening and index finger was placed just after the pinna of the ear. Patient reported uneasiness during the time of traction. She permitted horizontal traction for 4-5 times and rest was given with 5 second interval along with kneading 25 times over the area and 5 second rest [5]. The whole treatment of 20 sessions in total was given by the same physiotherapist. Intervention consisted of electrical stimulation, exercises and neural mobilization.

Treatment was given for a period of 5 days in a week for 4 weeks. She has taken in total 20 sessions of an intervention and the follow up was done 15 days after the completion of the last intervention. Pain was assessed on the Visual Analogue Scale and patient had reported reduction to 4 after 3 days of treatment. Patient was treated with seven days course of oral acyclovir (Zovirax) or valacyclovir (Valtrex), along with a tapering course of oral prednisone [7]. Patient had shown the complete recovery after 20 treatment sessions and Grade was reduced from III to grade I on MHBS. Patient had shown a significant improvement during her follow-up examination 15 days after the last day of treatment.

6. Results

After the completion of 20th day of treatment, patient has reported a significant improvement in the parameters. Values of VAS were reduced to 0/10 from 4/10. Similarly subject was assessed after the intervention of 20th session and showed decline in the severity level of facial asymmetry according to house brackmann's grading scale (grade I). Post assessment had showed an improvement in favour of neural mobilisation and electrical stimulation treatment

7. Discussion

In more than 70 percent of population, Bell's palsy recovers completely and there are only 30 percent patients who left with symptoms of facial disfigurement. The first line of treatment is the appropriate use of steroids in majority of cases. In spite of benefits, the use of drug therapy may be dangerous for patients having other co-occurring conditions like hypertension, diabetes, body aches and are taking non-prescribed medications [7]. .Therefore, there is a need to explore treatment methods which would be beneficial and without any side-effects on other conditions. Because of facial deformations, patient goes through a mental stress and depression most of times. Overall, Bell's palsy patient takes approximately 1 month for complete recovery of symptoms. Literature is supporting that EMS and facial exercises permits flexibility and improvement in correction of facial deformation. It has been revealed from the literature that there are few studies supporting the use of neural mobilisation in Bell's palsy [1]. This case study includes combination of conventional therapy like EMS and exercises along with mobilisation of 7th cranial nerve for 5 days a week for successive 4 weeks. It has been noted that patient recovered after the end of treatment and face remains symmetrical after 6th week of follow up. Depending upon the course of nerve root, traction was provided in a linear plane. The concept of mobilisation of nerve was applied on the bells palsy patient by focusing on the literature supporting the effect of nerve mobilisation on the peripheral and spinal nerves [5]. The patient made a full recovery at the end of last treatment session. Patient was assessed at 6th week after the last day of treatment session, indicating a complementary and beneficial effect of neural mobilisation along with electrical muscle stimulation therapy.

8. Conclusion

It is reasonable to say that clinical changes have been found in the patient before and after the intervention. These changes are positive towards the patient's recovery. This study is leading us to conclusion that EMS is beneficial in improving the partially denervated muscles. A recent and effective alternative therapy for acute care in Bell's palsy is neural mobilization in conjunction with traditional physiotherapy treatment. The fast and full recovery of the neural mobilisation experimental case demands a wide scale randomised controlled.

9. Limitations

- (1) There seems to be a shortage of a clinically accepted neural mobilisation technique for facial nerves in the literature survey.
- (2) Studies showing natural recovery of Bell's palsy within 3 weeks. Therefore, treatment time could be reduced to 2 weeks.

(3) Large sample size should be taken to justify the effectiveness of neural mobilisation in combination with conventional therapy.

(4) Single technique should be applied to the patient to find the accurate effectiveness of therapy.

References

1. Pulec JL. Bell's palsy: Diagnosis, management and results of treatment. *Laryngoscope*. 1974;84(12):2119–40.
2. Ohtake PJ, Zafron ML, Poranki LG, Fish DR. Does electrical stimulation improve motor recovery in patients with idiopathic facial (Bell) palsy? *Phys Ther*. 2006;86(11):1558–64.
3. Karadan U, Manappallil RG, Jayakrishnan C, Supreeth RN. Pontine haemorrhage disguised as Bell's palsy. *BMJ Case Rep*. 2018;2018:2017–9.
4. Henstrom DK, Skilbeck CJ, Weinberg J, Knox C, Cheney ML, Hadlock TA. Good correlation between original and modified house Brackmann facial grading systems. *Laryngoscope*. 2011;121(1):47–50.
5. Shacklock M. Neural mobilization: A systematic review of randomized controlled trials with an analysis of therapeutic efficacy. *J Man Manip Ther*. 2008;16(1):23–4.
6. Teixeira LJ, Soares BGDO, Vieira VP, Prado GF. Physical therapy for Bell's palsy (idiopathic facial paralysis). *Cochrane Database Syst Rev*. 2008;(3).