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PHYSIOTHERAPY MANAGEMENT IN BELL'S PALSY CASE WITH ELECTRICAL STIMULATION AND MASSAGE MODALITIES : A CASE REPORT

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Abstract

Introduction: Bell's Palsy is a condition where there is facial paralysis resulting in paralysis of the peripheral facial nerve acute and currently the cause is unknown (idiopathic) in the absence of other neurologic abnormalities. The goal to be achieved is to know the benefits of Electrical Stimulation and Mirror Exercise in the case of Bell's Palsy (BP).

Case Presentation: A 50-year-old woman presented with left-sided facial paralysis and asymmetry. The patient received therapy 6 times with Electrical Stimulation and Mirror Exercise modalities.

Management and Outcome: : Patient follows 6 times therapy in 1 week 2 times meeting, in 1 time therapy for 30 minutes which is given Electrical Stimulation modality for 15 minutes and Massage for 15 minutes. Muscle strength was measured using MMT (Manual Muscle Testing), and for facial functional ability using Ugo fish.

Discussion: The results obtained after doing therapy 6 times using Electrical Stimulation and Massage are an increase in muscle strength, and facial functional abilities M. Frontalis T0: 1 to T6:5 , M. Corugator supercili T0:1 to T6:5, M. Procerus T0:5 to T6:5, M.Orbicularis Oculi T0:1 to T6:3, M. Nasalis T0:1 to T6:5, , M.Zygomaticus Major & minor T0:1 to T6:5, M. Orbicularis Oris T0:1 becomes T6:3, M. Bucinator T0:5 becomes T6:5, M.Mentalis T0:5 becomes T6:5.

Conclusion: Management of Physiotherapy in the case of Bell's Palsy using an exercise program for 6 times therapy with Electrical Stimulation and Mirror Exercise modalities can be an intervention that can be done in overcoming the problem of Bell's Palsy

Keyword: Bell's Palsy, Electrical Stimulation, and Massage



Introduction

Bell's palsy is one of the idiopathic paralysis, which has unilateral peripheral facial weakness due to a non-suppurative, non-neoplastic, non-neo-degenerative primary process, but is very likely due to benign edema of the facial nerve in the stylomastoid foramen or slightly proximal to the stylomatoid foramen, which The onset is acute and can resolve on its own without treatment. The incidence of Bell's palsy is reported to be about 40-70% of all acute peripheral facial nerve palsy (Thielker et al., 2018).

The mean prevalence ranges from 10–30 patients per 100,000 population per year and increases with age. Incidence is increased in diabetics and pregnant women. About 8-10% of cases are related to a family history of having this disease. Symptoms of Bell's palsy can include paralysis of the facial muscles on one side that occurs suddenly a few hours to several days (maximum 7 days). Sometimes followed by hyperacusis, reduced tear production, hypersalivation and disturbances in the sense of taste (De Almeida et al., 2014).

The facial nerve (N.VII) is primarily a motor nerve that innervates the muscles of facial expression. In addition, these nerves carry parasympathetic fibers to the salivary and lacrimal glands and to the mucous membranes of the oral and nasal cavities, and also transmit exteroceptive sensation from the eardrum region, taste sensation from the anterior 2/3 of the tongue, and general visceral sensation from the salivary glands, nasal and pharyngeal mucosa, and proprioceptive sensation from the muscles it innervates (Zhang et al., 2020).

Apart from the poor prognosis, even a temporary deficit will affect the physical and psychological health and emotional expression of the patient during the repair process. Facial exercises such as Mirror exercise are effective in improving facial function and shortening the duration of treatment. During facial exercises, mirrors are used to allow subjects to observe their movements, and improve their motor control and perception (Eliyspoor C Baghban et al., 2017). Physiotherapy has modalities that aim to increase muscle strength so that it can increase functional activity and several modalities that can be given in the case of Bell's Palsy, namely Electrical Stimulation, Massage, and Mirror Exercise. Measurements to determine muscle strength using MMT (Manual Muscle Testing), and measurement facial functional ability using Ugo Fisch.

Case Presentation

Subjective Examination

The patient, Mrs. E, is 50 years old with a neurologist's diagnosis of Bell's Palsy. In May, the patient felt that his face felt uneasy as if he was pulled and when he looked at his face on the right side it was not symmetrical, the patient immediately came to the neurologist with the complaint that his face felt stiffness and tightness on the right side and mouth drooping to the left. Then the patient was referred to Physiotherapy and received therapy 2 times a week. Previously, the patient told that her husband likes to turn on the fan at bedtime and throughout the day. The patient has difficulty in full movement closing the right eye, has difficulty smiling, when drinking spilled water, and the patient is also uncomfortable interacting because there is a facial expression disorder.

Physical examination

1. INSPECTION/OBSERVATION

Static:

- Asymmetrical face
- Mouth drooping to the left

Dynamic:

- When asked to smile the patient has difficulty
- When asked to whistle (speech) the patient has difficulty

2. PALPATION

- Local temperature within normal limits
- The right side of the face feels tightness

3. BASIC MOTION CHECK

- Active motion

The muscles in the face are difficult to move active

- Passive motion check

The muscles in the face can be moved passive

- Isometric movement against resistance

The muscles on the right side of the face are difficult to move when given resistance

4. MUSCLE TEST (muscle strength, muscle control, muscle length, isometric resistance/pain provocation, muscle circumference)

Table 1.1 MMT Result

Muscle	Dextra	Sinistra
m. Frontalist	1	5
m. Supercili Corrugator	1	5
m. Orbicularis Oculi	1	5
m. Nasal	1	5
m. Zygomaticum	1	5
m. Orbicularis Oris	1	5
m. Buccinator	5	5
m. Procerus	5	5
m. Mentalist	5	5
m. Levator Labii	1	5

5. Functional Abilities and Activity Environment

The patient's functional activity was measured using the Ugofish Index:

Position:

- Silent / rest : 20
- Frown forehead : 10
- Closing eyes : 30
- Smiling : 30
- Whistling : 10

- a. 0% : complete asymmetry
- b. 30% : light symmetrical, asymmetric direction
- c. 70% : symmetrical
- d. 100% : complete symmetric

Prognosis:

- 0 - 29 : bad
- 30 - 69 : moderate
- 70 - 99 : good
- 100 : normal

Table 1.2 Results of Ugo Fisch

SILENCE	20 X 70% = 14
FROWNING	10 X 70% = 7
CLOSE EYES	30 X 70% = 21
SMILE	30 X 30% = 9
WHISTLING	10 X 30% = 3

Total	54
Moderate Prognosis	

Management and Outcome

The physiotherapy process is carried out twice a week with the aim of decrease stiffness on the right side of the face, increasing facial muscle strength, prevent asymmetry. For the long-term goal of increasing physical activity and facial functional abilities.

1. Electrical Stimulation

The provision of electrical stimulation aims to stimulate and cause facial muscle contractions so as to facilitate movement and increase facial muscle strength. Electrical Stimulation with Faradic Current. Faradic current is an asymmetrical alternating electric current that has a duration of 0.01-1 ms with a frequency of 50-100 cy/second (Burelo-Peregrino et al., 2020).

- Electrical Stimulation (Faradic Current)

Goal: Re-education Facial Nervus (N7), Increase Muscle Strength

Outcome : Muscle Test, Ugo Fish

1) Tool Preparation :

- a) check ES tools (cables, pads, etc.),
- b) wet the ped electrode first,
- c) plug the ES cable into the wall outlet,
- d) turn on the tool and make sure the tool is ready to use.

2) Prepare the patient :

- a) the patient lies supine in the bed as comfortable as possible,
- b) Explain the purpose of therapy

3) Management :

- a) Place the electrode pad on the back of the patient's neck
- b) Electrodes in the form of a pen are placed on 7 points of the face with a time of 2 minutes each point
- c) Turn on the tool, increase the intensity until contractions appear in the facial muscles.
- d) When finished, turn off the tool and tidy it up and return it to its place.

2. Massage

Massage is a structured series of pressure or touch. The hands and other body parts such as the forearms and elbows can be used to manipulate the skin, especially the muscles by massaging, stroking, efflurage, and pressing.

In Bell's palsy the facial muscles are generally stretched towards the healthy side, this

condition can cause stiffness on the affected side of the face. So that by giving massage in the case of Bell's palsy aims to stimulate sensory receptors and subcutaneous tissue on the skin so that it provides a relaxing effect and can reduce facial stiffness. Massage techniques commonly given to facial muscles include (1) stroking, (2) efflurage, (3) finger kneading, and (4) tapotement (Kashoo et al., 2021).

- Massage

Goal: Stimulation and relaxation of muscles

1) Tool Preparation :

a) Prepare Baby Oil

b) The therapist uses handscoon

2) Patient preparation :

a) The patient lies supine in the bed as comfortable as possible.

b) Explain the purpose of therapy

3) Implementation :

a) The therapist performs massage using efflurage, strocking, tapping, and fibration techniques

b) When finished, turn off the tool and tidy up and return it to its place.

3. Mirror Exercise

Mirror exercise is a relatively new therapeutic intervention that focuses on moving an undamaged limb. This is a form of image with a mirror used to convey visual stimuli to the brain through observing the unaffected body part when the individual performs a series of movements (Ding et al., 2020).

- Mirror Exercise

Goal: Increase Muscle Strength. Increases Facial Functional Activity

The patient follows the movements directed by the therapist while looking in the mirror. These movements include: raising eyebrows, frowning, closing the eyes, rising and falling nose, smiling broadly, whistling and lowering the mouth down.

Evaluation Plan

1. Evaluation of muscle strength using Muscle Test

2. Evaluation of functional measurements using the ugofish Index

After doing a physiotherapy program for 4 weeks with 2 interventions a week, the following results were obtained:

1. Evaluation of muscle strength using MMT

Table 1.3 MMT Evaluation Results

Muscle	T0		T6(end)	
	Dex	Sin	Dex	Sin
m. Frontalist	1	5	5	5
m. Corrugator Supercili	1	5	5	5
m.Orbicularis Oculi	1	5	3	5
m. Nasal	1	5	5	5
m. Zygomaticum	1	5	5	5
m. Orbicularis Oris	1	5	3	5
m. Buccinator	5	5	5	5
m. Procerus	5	5	5	5
m. Mentalist	5	5	5	5
m. Levator Labii	1	5	3	5

2. Evaluation of Functional Activities using Ugo Fisch

Table 1.4 Evaluation Results of Ugo Fisch

Movement	Score	
	T0	T6(end)
Silence	70% x 20 = 14	100% x 20 = 20
Frowning	70% x 10 = 7	100% x 10 = 10
Close eyes	70% x 30 = 9	70% x 30 = 21
Smile	30% x 30 = 9	100% x 30 = 30
Whistling	30% x 10 = 3	70% x 10 = 7
TOTAL	54 (MODERATE)	88 (GOOD PROGNOSIS)

Education (Bhar & Pandey, n.d.).

1. Patients are encouraged to do movements in front of the mirror (mirror exercise) at home

active facial movements such as raising eyebrows, frowning, closing and Open your eyes, smile, whistle, purse your lips, inflate your nose.

2. Patients are advised to avoid the use of fans that directly hit face and avoid sleeping on

the floor.

3. Functional exercise by getting used to using the side of the lesion to chew, blow, drink with a straw.

Discussion

The Physiotherapy program which was carried out for 4 weeks with 1 week of 2 treatments with complaints of facial stiffness and asymmetry obtained significant results in the treatment given, namely Electrical Stimulation and Massage. With the results M. Frontalis T0:1 becomes T6:5 , M. Corugator supercili T0:1 becomes T6:5, M. Procerus T0:5 becomes T6:5, M.Orbicularis Oculi T0:1 becomes T6:3, M Nasalis T0:1 to T6:5, , M.Zygomaticus Major & minor T0:1 to T6:5, M. Orbicularis Oris T0:1 to T6:3, M. Bucinator T0:5 to T6:5, M. Mentalist T0:5 to T6:5 and Ugo Fisch T1:56 (moderate) to T6:88 (good)

Electrical stimulation of the patient is carried out using faradic currents with the aim of re-education of the Facial Nerve (N7) and increasing muscle strength. Faradic current is an asymmetrical alternating electric current that has a duration of 0.01-1 ms with a frequency of 50-100 cy/second. Electrodes in the form of a pen are placed on 7 points of the face with a time of 2 minutes for each point with a total treatment of 15 minutes (Tuncay et al., 2015).

In addition to electrical stimulation, there is another modality to reduce stiffness in facial muscles, namely massage. In Bell's palsy the facial muscles are generally stretched towards the healthy side, this condition can cause stiffness on the affected side of the face. Therefore, the massage modality aims to stimulate sensory receptors and subcutaneous tissue on the skin so that it provides a relaxing effect and can reduce facial stiffness. Massage techniques that are usually given to the facial muscles include (1) stroking, (2) euffleurage, (3) finger kneading, and (4) tapotement (MOHAMED H. RASHAD, Ph.D. & MUSTAFA S. MOHAMED, M.Sc., 2019).

Conclusion

The Physiotherapy program in the case of Bell's palsy using Electrical Stimulation and Massage modalities for 6 therapy times showed an increase in facial muscle strength and increased facial functional abilities such as frowning, closing the eyes, smiling and whistling. Electrical Stimulation and Mirror Exercise modalities can be an intervention that can be done in overcoming the problem of Bell's Palsy.

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