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Case Report

Treatment of Bell's palsy by combination of Laser and Kabat rehabilitation: a case study

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ABSTRACT

This study examined the role of Kabat Rehabilitation and laser therapy in Bell's palsy patient, and its effectiveness in physical and social function. Individuals with Bell's palsy, which produces the facial mimicry, it's crucial for rehabilitation of facial muscle paralysis. PNF enforces and encourages the muscular action on the weaker side of the face, it enables patients with Bell's palsy perform better physically and socially**.** Therefore, the effectiveness of Kabat therapy in conjunction with Laser was proven in this investigation. The study was conducted at the outpatient department (OPD), Neuro Physiotherapy, Dr. APJ AK COPT. Patient received the Kabat rehabilitation therapy, as well as laser therapy. In this study, results were found significant in HBS and FDI scale comparing pre and post scores by progressing from moderate to normal on grading and progression of 30% on FDI scale. Hence, we conclude that this intervention could be an adjunct intervention in rehabilitation of Bell's palsy. Physiotherapy Program including Laser therapy and Kabat rehabilitation for 3 weeks had shown significant on the treatment of Bell's palsy. Hence, it has proven that it could be used as an adjunct intervention on patient with Bell's palsy.

Keywords: Bell's palsy, Laser, Kabat rehabilitation

INTRODUCTION

Bell's palsy is a sudden idiopathic peripheral facial nerve paralysis. This disease is caused by some form of injury to the VII cranial nerve, resulting in full or partial facial mimics. It could be related to or unrelated to issues with hypersalivation, ocular, and auditory function.[2] Eventually, people between the ages of 25 and 50 are affected by the condition. A study found that persons over 60 with a history of diabetes and high blood pressure are more likely to develop Bell's palsy. Only a small percentage of patients with complete paralysis were able to regain their usual mimic function. Bell's palsy is the result of facial muscle paralysis on the side of the face that is afflicted. The symptoms that an individual experience might range from mild to severe. The symptoms include unilateral and, in rare instances, bilateral voluntary loss of facial movements, resting asymmetry caused by muscle weakness, drooping eyelids, pain around the auricle, hyperacusis, and changes in taste.[1] Bell's palsy has a long-term negative effect on a person's physical and social wellbeing. Functionally speaking, it becomes exceedingly challenging to eat, drink, or express oneself (verbally or nonverbally). Although the symptoms usually disappear completely, some people continue to have them.

Light amplification by stimulated emission of radiation, or Laser, generates laser light that is monochromatic, bright, coherent, and unidirectional. Bell's palsy is managed with the help of the Laser modality. It is thought to be a painless, non-invasive therapy strategy that may be used on any patient population, even those who are unable to use corticosteroids, like diabetic and hypertensive people.[3]

The use of lasers can enhance the process of nerve regeneration by having both local and systemic effects.[3] Treatment for Bell's palsy electrotherapy, massage, face exercises, Kabat rehabilitation, and biofeedback are examples of physical therapy techniques. Laser therapy for peripheral nerve regeneration provides a promising future.

Proprioceptive neuromuscular facilitation (PNF) techniques and basic facilitation techniques should be used to exercise the facial muscles as much as feasible. To encourage movement on the weaker side, stretching and resistance exercises are performed. Icing is beneficial for facial muscles that are paralysed or weak before beginning PNF workouts. Icing the face muscles increases the tone of the muscle spindle, increasing their sensitivity to stretch and resistance. PNF exercises should always be done on both sides of the body to allow the therapist to apply more radiation to the side of the face that is paralysed or stronger. Time is key during PNF treatment, as full mobility is prevented on the normal side while the weaker side is strengthened and has more muscle activation.

CASE REPORT

A 49-year-old man with right side dominance presented to the inpatient unit of Pravara Medical Trust with the main complaint of neck pain for one month. However, 15 days earlier, while out for a morning walk, he had also experienced teary eyes, difficulty closing his right eye, difficulty speaking and eating breakfast, drooping saliva, and difficulty brushing his teeth. He was given medication recommendations and referred to the physiotherapy department. The patients underwent grades of 3 and scoring of 125/200 on the FDI according to the studies of the House Brackmann grading scale and facial disability index. The patient was diagnosed with facial bell’s palsy.

Outcome measures

House Brackmann grading (r=0.86) - the greater the score, greater the severity, lesser the score, lesser the severity).[14]

Facial disability index (r=0.83) - lesser the score, lower the functioning, greater the score, higher the functioning).[1]

Intervention

Physiotherapy management

The objectives of physiotherapy management of the Bell’s palsy aims to make the patient physically and socially independent in his daily activities all while correcting the patient's face symmetry: to inform and reassure the patient about their illness; to alleviate discomfort; to lay the groundwork for retraining in muscle and nerve conduction; to improve or facilitate muscle contraction, if necessary, to re-educate affected sensations (sensory integration: touch, two-point discrimination, temperature); to promote or enhance face symmetry; and to prevent secondary complications.

Means of management

Describe the patient's condition to include its causes, incidence, prognosis, and available treatments.

Boost the patient's confidence, but be reasonable (don't set unreasonable expectations).

Advise the patient to take the medication that has been recommended by their doctor and to stay away from non-professionally administered therapy. Tell the patient that taking his or her prescribed medicine and adhering to the physical therapy plan is sufficient.

If the patient's eyes are affected, they should: use eye drops (as your doctor advised) and avoid exposure to harsh indoor lighting, direct sunshine, or being too near to a television; protect your eyes by using sunglasses; and avoid prolonged reading to strain your eyes, and stay away from air conditioners up close.

Explain to the patient how their psychological state can influence their response to treatment. They should avoid emotional conflict and seek out support from family and friends to improve their sense of self and self-worth.

Treatment options

The options available for physical therapy management to achieve the mentioned goals are as follows.

Electrotherapy

Laser increases the energy of the inflammatory area, also consider as anti-inflammatory, recommended to use it for elderly with poor metabolic or nutrition.

The two major uses of laser therapy are for tissue healing and pain control.

By penetrating axons or nearby Schwann's cells, laser light induces reinnervation of the tissues by causing the impaired tissue to secrete proteins associated to nerve growth or the release of mediators of nerve growth that will affect undamaged surrounding nerves.

Dosage

The amount of energy falling on surface is expressed in joules per square metre, often called energy density.

The rate at which energy is produced or absorbed is measured in joules per second i.e. in Watts ($1W=1J_s^{-1}$) and called power.

Most lasers have output powers of milliwatts. The average power per unit area is expressed as irradiance or power density in W cm^{-2}.

The penetration depth of red visible and short infrared radiation is few millimeters, 1-2 mm fop He-Ne lasers (red light) and 2-4 mm for Ga Al As lasers (IR lasers) of 800-900 nm in soft tissue.

Dosage

7 J/cm^2 for each point for 8 minutes, 2-3 sets per session, 5 times per week for 3 weeks.

Figure 1: Laser therapy.

Kabat rehabilitation

Kabat rehabilitation is type of motor control rehabilitation technique based on proprioceptive neuromuscular facilitation (PNF).

During Kabat, therapist facilitate the voluntary contraction of the impaired muscle by applying a global stretching the resistance to the entire muscular section and motivate action by verbal input and manual contact.

When performing Kabat, 3 regionals are considered: the upper (forehead and eyes), intermediate (nose), and lower (mouth). Prior to Kabat, ice stimulation has to perform to a specific muscular group, in order to increase its contractile power.

Dosage

8-10 repetitions in 1 set, 2-3 sets per week 5 times for 3 weeks.

Patient participated in the study was given Kabat rehabilitation and Laser therapy for 3 weeks. The patient was assessed by FDI and HBS scale before intervention and reassessed after 3 weeks of intervention. The results were found significant difference after 3 weeks in HBS and FDI scale comparing pre and post scores by progressing from moderate (grade 3) to normal (grade 1) on grading and progression of 30% on FDI scale.

Figure 2: Kabat rehabilitation.

Table 1: Shows pre and post values of the Outcome measures.

Parameters	Pre-test score	Post-test score
House Brackmann grading	3	1
Facial disability index	125/200	186/200

DISCUSSION

Damage to the facial nerve that occurs at the level distal to the pons causes Bell's palsy, an acute disease. It affects the face and is idiopathic.

Anti-inflammatory, antibacterial, and antiviral medications may be dose-tested as treatment options, and in extreme circumstances, surgical decompressive treatments may be considered.[1]Additionally, physiotherapy has been proven to provide a wide range of benefits in treating Bell's palsy and is a viable therapeutic option.[1] The goal of the current study was to compare how Bell's palsy was treated using Kabat rehabilitation and laser therapy, as well as any potential improvements in physical and social function.[14]

Khullar et al suggested that Laser light might stimulate reinnervation of the tissues by either the penetration of the axons or on adjacent Schwann's cells inducing the compromised tissue to secrete proteins related to nerve growth or the releasing of mediator of nerve growth that will affect non-damaged adjacent nerves.[2] These aspects were reflected on the treatment of the patient. Despite the positive result of the treatment, further studies are needed to elucidate the effect of the laser light on nerve as well as on the aetiology of Bell's palsy.

By using retraining strategies, the problem was treated in a way that improved outcomes and increased patient satisfaction. It emphasises enhancing range, preventing flaccidity, stopping synkinesis, and enhancing face motor control.[1]Technique for facial neuromuscular retraining using sensory and motor feedback. It makes use of coordinated activities and sensory input to encourage and restore the proper facial movement patterns while inhibiting any undesirable, unwanted, and abnormal facial expressions.[14]

The study's goal was to assess how PNF training affected the facial profile. PNF, which entails administering global stretching and resistance one at a time, is used to improve the voluntary contraction of injured muscles.[4] Then, in order to help the periorbital muscles, adjust to the new morphological conditions, resistance is exerted verbally and manually, such as by elevating the upper lip and lowering the lower lip to pull the tongue out.[4] The results showed that extra training is necessary to prevent recurrence even if the training appeared to be beneficial in sharpening the mouth and submandibular region to improve facial profile.[13]

CONCLUSION

Physiotherapy program including Laser therapy and Kabat rehabilitation for 3 weeks had shown significant positive effect on the treatment of Bell's palsy. Hence, it has proven that it can used as intervention on patient with Bell's palsy.

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