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Fast Recovery Treating with Alternative Tens and Laser Therapy in Acute Case of Bells Palsy: A Case Report

Dr. Doyel Roy (1st) (Senior lecturer, dept of Oral medicine and radiology, Dr. HSRSM Dental College and Hospital, Hingoli, Maharashtra, 431513, dr.rodoyel2206@gmail.com)

Dr. Sangamesh NC (Prof & HOD, dept of Oral Medicine and Radiology, Kalinga Institute of Dental Sciences, csang63@rediffmail.com)

Dr. Gargi Ghosh (BDS, MPH) (dr.gargi25@gmail.com)

Abstract:-

Bell's palsy is a state of temporary weakness of the facial muscles. It can occur when the nerves that control facial muscular activity become inflamed, swollen, or compressed. Difficulty in smiling or closing eye on the affected side is one of the most common difficulties, faced by most of the patients. In most cases, Bell's palsy is temporary and symptoms usually go away after a few weeks to months. Although Bell's palsy can occur at any age, the condition is more common among middle-aged people. It is named after the Scottish anatomist Charles Bell, who was the first to depict the condition. Most of the time etiology is unknown or idiopathic. Steroids are the first line drug of choice. There are reported cases of Bell's palsy treated with electrical stimulation, Laser, and other palliative treatment modalities like antivirals, Vitamin B_{12} combined with steroid and physical therapy, as well as heat therapy. Here, a case of acute idiopathic Bell's palsy is described with complete recovery within two weeks.

Key Words: - Bell's palsy, Bell's Phenomenon, TENS and Laser therapy, Facial Disability Index

Introduction: -

Bell's palsy occurs due to neurological involvement of the Cranial Nerve VII, incontestable as muscular weakness on the affected site of face as well as facial sagging. It may be partial or complete with equal prevalence on each side of the face.(1) The other symptoms may include facial numbness, mild pain in or just behind the ear, impaired tolerance to noise, and might be associated with altered taste mostly on the anterior 2/3rd of the tongue.(1) Most of the time the cause is unknown, at about 70% of Bell's palsy cases are considered to be idiopathic in origin. However, herpes simplex virus has been reported as one of the most common etiologic factors.(2) Sometimes, other etiologic factors like autoimmune diseases, genetic factors, trauma, tumors of the head-neck region, diabetes mellitus, and other inflammatory diseases also can cause facial paralysis. 30 to 50 years of age group is more prevalence for the disease to occur.(4) Though it is self-limiting (2), the treatment is essential to reduce long-term complications and quick recovery. (5) The first line of treatment is considered oral corticosteroids and antiviral drugs.(5) 50–60 mg prednisolone daily for 10 days is the commonly recommended dosage (1 mg/kg/day up to a maximum of 80 mg has been proven to have a good effect). More than 120 mg/day can be used safely in patients with diabetes.(6) In a randomized controlled trial (RCT) the recovery rate of Bell's palsy at nine months after delivery of prednisolone was 94%.(7) The aciclovir (400 mg five times daily for five days) or valaciclovir (1000 mg/day for five days) showed to have better results and proved to be a good adjunct in some reported cases and recovery rate around 85.4%. 92.7% recovery rate of patients who have received combined medication (steroid & antiviral) and without serious adverse effects. A Cochrane review in 2015 found that antivirals combined with corticosteroids have a better effect than corticosteroids alone.(5) Besides these, TENS, LLLT, Physical exercise, hot pack and massage therapy have been proven to have good results in the recovery of Bell's palsy. (7)

Case Report:-

A sixty-four-year-old male reported to the Department of Oral Medicine and Radiology at Kalinga Institute of Dental Sciences, KIIT University, Bhubaneswar, Odisha with the complaint of deviation of face to the left side, inability to chew and drink properly, and also the inability to close his right eye since 2 to 3 days. He mentioned the symptoms to have a sudden onset, sudden progression without any history of trauma, fever, malaise or prodromal symptoms, pain in

the ear (otalgia), or previous history of the same episode. On further enquiring, there was no relevant past medical, family, dental or surgical history given by the patient. On examination, gross asymmetry was noted with deviation or specifically muscle pulling to the left side of the face. There was absence of forehead wrinkling on the right side of face, associated with absence of right nasolabial fold. The right corner of the lip drooped to 2 to 3 mm below the plane. The patient was unable to speak properly and showed evidence of a teary right eye (epiphora) as well. When the patient was asked to perform some activities the following characteristics were noted:

1. While opening his mouth, it deviated to the left side.
2. While closing his eyes, the right eyeball rolled upwards, suggestive of the characteristic Bell's phenomenon.
3. In an attempt of raising the eyebrows, the right eyebrow did not move upwards.
4. While blowing, there was the leaking of air from the right corner of the lip.

On Intraoral examination, there were no relevant findings. Based upon the chief complaint and examination, a diagnosis of Bell's palsy in relation to the right side of the face affecting the lower motor neurons with acute onset and idiopathic etiology was established. The patient was reluctant to undergo any investigatory procedures. Considering the age of the patient, he was prescribed 10 mg prednisolone twice a day for 14 days, after which the dose was tapered accordingly with an interval of 7 days. Acyclovir 400mg also was prescribed twice a day for 7 days and Vit B12 with folic acid once a day for 3 months. Facial disability index on the criteria of eating, drinking, speaking, brushing, and tearing of the eye were recorded on the Visual Analogue scale in every alternative day and after two weeks of pharmacotherapy no sign of improvement noted. After 14 days of treatment, strategy were altered by applying TENS and low-level LASER therapy (LLLT) in alternatively weekly thrice. Facial disability index (FDI) before the procedures and also after every session of TENS and LLLT were recorded. He was also instructed to apply heat for 5 minutes (58 cm long and not exceeding 70 ^{0}C) three times a day. Every time after the application of heat, one session of massage therapy for 10 minutes was instructed to be performed bilaterally on the face and neck region. The sequence included 30 seconds of simultaneous stroking over both sides of the face and neck, two minutes of circular massage using three fingers working from the center to the outer face according to Diels 2000. (8)

TENS therapy: - On day one, the two electrodes were first set in the unaffected side and frequency was recorded when the left eye started to blink and the left corner of the lip started to quiver. Then the same frequency was applied to the affected site. 10 Hz frequency for 30 minutes applied affected area of face targeting the muscles as shown in fig 1.

Fig.1 TENS therapy application

Low-level LASER

Therapy (LLLT): - On every alternate day the LLLT was applied on the right side of the face with a diode laser, 810nm wavelength, 1 joule/sec, o.1 watt, for 2 minutes in each out of 10 target points as shown in fig 2. Total of 20 minutes and 100 jule laser has been applied to the affected area.

On the 5th day of treatment, the VAS scale started to show a gradual decrease in values while taking the facial disability index. The score has been tabulated below according to the significant changes in the FDI. The treatment was continued for another two weeks.

Fig. 2 showing area where LLLT was applied

Table showing the significant decreasing VAS scores of FDI from day one to two weeks of treatment

Day	Eating	Drinking	Speaking	Brushing	Tearing of Eye
1st	8/10	8/10	7/10	7/10	7/10
5th	7/10	6/10	6/10	7/10	5/10
7th	6/10	5/10	5/10	5/10	3/10
10th	3/10	2/10	3/10	3/10	2/10
12th	2/10	1/10	2/10	1/10	0/10
13th	1/10	1/10	0/10	1/10	0/10
14th	0/10	0/10	0/10	0/10	0/10

The above table explains how FDI started to decrease and became zero after two weeks of vigorous treatment. The patient is under follow-up and instructed to visit the hospital every three months. The following figures show the pre-op and post-op pictures of the patient.

Fig. 3 (a) & (b) Day one Patient's profile

Fig. 4 After two weeks of treatment

Discussion: -

Here the case report showed how an acute case of idiopathic Bell's palsy can be successfully treated within two weeks with LLLT and TENS therapy where pharmacological therapy was resistant. The facial muscle exercise and heat therapy can act as an tremendous adjunct procedure. As the Laser have anti-inflammatory, wound healing, regenerative characteristic, 810nm Diode Laser with 0.1 watt for 2 minutes might be sufficient to re-established the muscular activity. 10 Hz low intensity current used in TENS therapy for 30 minutes might be also one of the best method to procure the activity.

According to Dhruvashree S and Frank S management of bell's palsy is necessary to reduce further complication and faster recovery. According to their study oral corticosteroids and antiviral combined drugs therapy is one of the best treatment approach. They reported, 92.7% recovery rate associated with those patient who took combination of medicine which was clearly higher rate of recovery than patients had taken both the medication alone.(5) Although an article published by Frank M. S etal considered early corticosteroid therapy alone can restore the facial function within three to nine months. He mentioned antiviral drug has no role to recover this disorder.(7) Study done by P M Grogan and G S Gronseth mentioned that there is lack of definitely established data regarding corticosteroid therapy or combined with antiviral drug or any surgical procedure that can recover the facial muscle paralysis.(9) In this case combination therapy of prednisolone and acyclovir were prescribed to the patient and followed up for two weeks with no significant improvement.

As the condition shown resistant to drug therapy the patient was advised for TENS and LLLT alternatively. Kit-Lan (1991), Farragher et al (1987), and Mann et al (2000) used a 10Hz, 10Hz to 40Hz pulse respectively in their study of chronic Bell's palsy. As low intensity current may cause regeneration of nerve TENS therapy become effective procedure.(10) Kimura et al (1976) and Leon-Sarmiento (2002) mentioned Physical therapy with electrical stimulation considered to be a rationale of treatment plan. But in some studies like Diels (2000), showed no significant result after giving electrical stimulation to the facial nerve.(10) However in this case TENS therapy became very much effective and 10 Hz for 30 minutes alternative days for two weeks became sufficient to treat an acute case.

Chow et al. reasoned that the nerve structure is influenced directly by LLLT, which in turn increases the healing capacity of communication blocks.(10) Also, researchers have uncovered that LLLT dilates capillary vessels, and arterial vessels, increase circulation, and thereby stimulates nerve regeneration and also cause betterment of immunological process.(12) Laser treatment has been revealed to put forth an anti-inflammatory effect by lessening the level of proinflammatory cytokines such as interleukin-1 alpha & beta. (13) LLLT can also cause hyperplasia, RNA and DNA synthesis, collagen production, and production of growth factors.(2) The data said that about 69% of patients exhibit spontaneous improvement with this advanced procedure where as remaining 31% may take more time to recover.(14) In the above mentioned case LLLT have shown good efficacy treating an acute case of palsy. Within two weeks complete recovery achieved.

Conclusion: -

As the patient did not co-operate for imaging of the nerve and blood investigation could not be done, this remains as one of the limitations of this report. But it can be concluded that TENS and LASER therapy are both equally effective with palliative therapy like physical exercise, massage and thermal therapy in the treatment of an acute case of Bell's palsy to re-establish facial symmetry.

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