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**Clinical Evaluation, Oxidative Stress Status and Antibody
Detection of Certain Viruses in Serum and Saliva of Chronic
Bell's Palsy Patients Treated with Two Treatment Modalities**

A Thesis

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Abstract

Backgrounds

Peripheral paralysis of facial nerve also called Bell's palsy is the most prevalent damaging of the cranial nerves that affect facial nerve and muscles. It suddenly occurs with idiopathic weakness behavior. The weakness, result in dropping of one side of the face, pain in mastoid region and paresthesia of the anterior 2/3 of the tongue with partial or complete facial disfiguring. Light amplification by stimulated emission of radiation (LASER) is one of the most effective therapeutic lines in the field of physiotherapy. The Low-level laser therapy may have advantageous effects in reducing facial nerve inflammation; recline in edema and facial nerve compression.

The electrical stimulation of facial muscles aims to preserve muscle bulk especially in complete paralysis, and it has also a psychological benefit as the patient observes muscle contraction in his face.

Oxidant – antioxidant imbalance, increasing oxidative stress status and leads to deregulation of normal body metabolism, physiology and damage of biological macromolecules which play important roles in development of inflammatory process.

Aims of the study

To evaluate the efficiency of low level laser therapy in treatment of Bell's palsy in compared to transcutaneous electrical nerve stimulation and applying House Brackmann grade to determine the disease grade.

Assessment of oxidative stress biomarker Malondialdehyde and anti-oxidants (Vitamin E and total antioxidant capacity) in serum and saliva of those patients and compare that with healthy control subjects, also to compare between two groups of patients on low level laser therapy and transcutaneous electrical nerve stimulation before and after treatment.

To assess the association between Bell's palsy and virus infection of herpes simplex-1 and varicella zoster by studying serum and saliva IgG and IgM indices before and after treatment and with control.

Subjects, Materials and Methods

One hundred twenty subjects were participated in this study; they were divided into two groups, the first one with eighty patients with Bell's palsy subdivided into two subgroups according to the method of treatment; forty patients were treated with low level laser therapy and forty patients were treated with transcutaneous electrical nerve stimulation. The second group was forty healthy control subjects, with no signs and symptoms of any systemic diseases. Bell's palsy patients were clinically examined and evaluated before and after treatment based on House Brackmann Scale. Serum and saliva samples were taken from each subject before and after treatment for analysis. Malondialdehyde, antioxidants (vitamin E and total antioxidant capacity), herpes simplex-1 and varicella zoster IgG and IgM kits were used for laboratory diagnosis.

Results

The age range of patients was 20- 70 years, with a mean \pm S.D of (43.6 \pm 15.6) years and for the healthy control was (45.4 \pm 15.9) years.

No significant difference was found between the age of patients and that of control. The number of male Bell's palsy patients was higher than females; the number of patients with right side Bell's palsy was higher than that of left side. Patients were with disease durations of 1- 4 months, and all patients were in grades III, IV, V, with the highest number of patients was with grade V.

Clinically, the results showed that the recovery proportion was higher in patients treated with low level laser therapy than with transcutaneous electrical nerve stimulation, which was about (75%).

For Bell's palsy patients, the results showed high serum and saliva oxidative stress biomarker (malondialdehyde) before treatment and low levels of both antioxidant parameters (Vitamin E and total anti-oxidant capacity) in serum and saliva of those patients before treatment when compared to healthy subjects.

The majority of Bell's palsy patients was those with positive serum herpes simplex- type one IgG index, followed by serum varicella zoster IgG index, and were significantly higher in those patients than in control subjects.

There was a highly significant reduction in serum and saliva malondialdehyde after both treatments and was significantly lower in patients after low level laser therapy than in those who treated with transcutaneous electrical nerve stimulation.

A highly significant increase in serum and saliva vitamin E level and total anti-oxidant capacity after low level laser therapy, and transcutaneous electrical nerve stimulation, and were significantly higher in low level laser therapy treated patients than after transcutaneous electrical nerve stimulation.

The number of Bell's palsy patients with positive herpes simplex virus-one and varicella zoster virus (IgG and IgM) indices were decreased after both treatments.

Serum herpes simplex type- one and varicella zoster IgG indices were still positive and significantly higher in Bell's palsy patients after transcutaneous electrical nerve stimulation than in those treated with low level laser therapy. Also, saliva herpes simplex type- one IgM, serum and saliva varicella zoster - IgM were significantly higher after transcutaneous electrical nerve stimulation.

Conclusions

Oxidative stress increased in serum and saliva of Bell's palsy patients which plays a pivotal role in the pathogenesis of this disease. Low level laser therapy is effective physical therapy for the recovery of patients with Bell's palsy with no adverse effects reported and with better results than

transcutaneous electrical nerve stimulation in which its application cause discomforts to those patients. This study provided clinical evidence to document the early beginning with low level laser therapy as an alternative noninvasive treatment. The presence of antibody responses (indices) to herpes simplex- type one and varicella zoster in serum of patients with Bell's palsy indicate the association between viral infection and Bell's palsy.