Syrian Arab Republic

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Faculty of Dentistry

Oral Medicine Department

A comparative study among three different wavelengths of low level laser on recurrent aphthous ulceration management

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Introduction :

Aphthous stomatitis is a common painful recurrent oral ulcer that disturbs the daily activities of patient like eating , talking and maintaining oral hygiene. It is a disorder that characterized by a small recurrent ulcers in the oral mucosa. The main symptom that the patient complains about is the severe pain. The pathogenicity is unknown , the immunity plays an essential role in the aphthous pathology. The ulcers are clearly delineated, small, round lesions with an erythematous halo. They appear mostly on the movable oral mucosa, especially lips, cheeks, tongue and soft palate. Most often they appear in groups of two or three lesions. These ulcers lead to wounds in the oral epithelium, thus exposing the nerve endings associated with pain.

Until today , a large number of treatment protocols for aphthous have been proposed, and because its causes are unknown, treatment options are symptomatic, that is, not curative or preventive. It has recently been suggested that laser therapy can be used with success as an effective approach in treating recurrent aphthous ulcers. As it has proven its ability to accelerate healing and relieve pain by stimulating metabolism and photobiomodulation and reducing inflammation at the site of the ulcer. With multiple wavelengths and studies on them to manage aphthous, we directed to compare the effectiveness of three wavelengths of low-power laser because of its features (low Its price compared to other lasers, its small size and weight, ease of use for professionals, and the possibility of its application for different ages and with different health conditions of the patient ..) that make it a practical device.

Aim of the study :

-Evaluation of the effectiveness of GaALAs 808nm laser in the management of aphthous lesions in terms of measuring pain, acceleration of healing, redness, patient satisfaction with treatment and recurrence, in comparison with the control sample.

-Evaluation of the effectiveness of the ALGaInp 660nm laser in the management of aphthous lesions in terms of measuring pain, acceleration of healing, redness, patient satisfaction with treatment and recurrence, in comparison with the control sample.

- Evaluation of the effectiveness of GaAs 635nm laser in the management of aphthous lesions in terms of measuring pain, acceleration of healing, redness, patient satisfaction with treatment and recurrence, in comparison with the control sample.

-Clinical comparison between these treatments.

Materials and Methods:

Study design:

A randomized, controlled clinical study .

Sample collection:

The sample will be collected from the patients reviewing the Oral Medicine Department at the Faculty of Dentistry at Damascus University, and the patients will be entered into the study sample based on the following inclusion and exclusion criteria:

Inclusion criteria:

1. Patients with one or more aphthous lesion.

2. The lesion site on the buccal or labial oral mucosa, tongue, or floor of the mouth.

3. The patient has a history of recurrence.

4. No more than 48 hours have passed since the appearance of the lesion until the working day.

5. The diameter of the ulcer does not exceed 5 mm.

6. Age of 20 to 40 years.

7. The patient can attend the follow-up.

8. no other treatments for the present apthous ulcers.

9. Avoid pungent foods and acidic drinks during the follow-up period..

Exclusion criteria:

1. A smoker patient.

2. Patients with systemic condition related to oral ulcers such as Crohn's disease.

3. The patients taking antibiotics or anti-inflammatory drugs during the month before treatment.

Study procedure:

The medical history was taken from the patient, the careful clinical examination, the informed consent to participate in this study and the commitment to follow-up.

The samples were sorted randomly, where 4 similar classifiers containing 4 symbols (English letters A, B, C, D) were placed, where each group had a previously defined symbol, and the classifiers were randomly drawn so that the first sixteen patients were entered in the group that was drawn first and The second sixteen patients in the group that were withdrawn secondly, and so on... with the help of an assistant researcher.

treating recurrent aphthous ulcers on 64 patients (divided into 4 groups) with three laser wavelength (808nm,660nm,635nm) controlled with placebo as application of an activated laser as following:

1. GaAs 635 nm gallium arsenide laser:

Power: 220 milliwatts

Fluency: 4.2 J/cm3

Depth of tissue: 1 cm

The necessary irradiation time(treatment time): 19 seconds / 2 times, separated by 30 seconds rest

Laser beam spot size: 0.5 cm2

Irradiance: 0.34 W/cm2

Application method: direct contact . (to focus the rays over the ulcer area)

2. AlGaInP 660 nm Aluminum gallium indium phosphide laser:

Power: 150 milliwatts

Fluency: 4.1 J/cm3

Depth of tissue: 1 cm

Irradiation time: Treatment Time: 27 seconds/twice, with 30 seconds rest between them

Laser beam spot size: 0.5 cm2

Irradiance: 0.24 W/cm2

Application method: direct contact.

3. GaAlAs 808 nm gallium aluminum arsenide laser:

Power: 250 milliwatts

Fluency: 4 J/cm3

Depth of tissue: 1 cm

Irradiation time: Treatment Time: 16 seconds/twice, with 30 seconds rest between them

Laser beam spot size: 0.5 cm2

Irradiance: 0.40 W/cm2

Application method: direct contact.

Clinical evaluation:

1-Pain is measured using a visual analogue scale (VAS) at baseline, before treatment, directly after treatment, and on days 2, 3, 5, 7 after treatment.

2-Lesion size is measured using dental probe at baseline, before starting the treatment, and on days 3, 7.

3-Erythema is measured using a scale based on Greer et al rules on a 4-point scale at baseline before starting treatment and immediately after treatment, and on days 3, 7.

4-Patient's Satisfaction Index is measured using VAS scale.

5-Recurrence is measured after one month in same place of treatment.