LETTER TO THE EDITOR

ROLE OF DIODE LASERS IN ORO-FACIAL PAIN MANAGEMENT

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With the increasing use of low level laser therapy (LLLT) in clinical dentistry, the aim of the present study was to assess the effectiveness of diode lasers in the management of orofacial pain. Indexed databases were searched without language and time restrictions up to and including July 2016 using different combinations of the following key words: oral, low level laser therapy, dental, pain, diode lasers, discomfort and analgesia. From the literature reviewed it is evident that LLLT is effective compared to traditional procedures in the management of oro-facial pain associated to soft tissue and hard tissue conditions such as premalignant lesions, gingival conditions and dental extractions. However, it remains to be determined which particular wavelength will produce the more favorable and predictable outcome in terms of pain reduction. It is highly recommended that further randomized control trials with well-defined control groups should be performed to determine the precise wavelengths of the diode lasers for the management of oro-facial pain. Within the limits of the present review, it is concluded that diode lasers therapy is more effective in the management of oro-facial pain compared to traditional procedures.

To the Editor,

One parameter that determines the success of any clinical therapy is management of pain associated with the disorder. A variety of scales have been developed to assess the severity of pain, which include the Likert scale, Visual Analog Scale (VAS), Numerical Rating Scale and the orofacial Pain Scale for non-verbal individuals (1-3). One intervention, which is effective in the mediation of acute and chronic pain, is low-level laser therapy (LLLT) (4, 5). It has been suggested that diode lasers play a role in the mediation of analgesia by affecting the synthesis, metabolism and release of neurochemicals, such as endorphins and encephalin, which alter nerve conduction and modify pain response (6). Diode lasers have been used to reduce oro-facial pain associated with dental extractions (7), orthodontic treatment (8) and trigeminal neuralgia (9).

With the increasing use of LLLT in clinical dentistry, the aim of the present review was to assess the effectiveness of diode lasers in the management of oro-facial pain.

MATERIALS AND METHODS

Indexed literature in PubMed/Medline (National Library of Medicine, Washington, DC), Cochrane Register of Systematic Reviews, EMBASE, ISI Web

Key words: lasers, low-level light therapy, oro-facial, pain

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DISCLOSURE: ALL AUTHORS REPORT NO CONFLICTS OF INTEREST RELEVANT TO THIS ARTICLE.

of Knowledge and Google-Scholar databases were searched using the following key words: (a) oral; (b) low level laser therapy; (c) dental; (d) pain; (e) diode lasers; (f) discomfort; and (g) analgesia. Letters to the editor, commentaries, and conference abstracts were excluded.

RESULTS

Some studies (10-13) have reported that there is no difference in the severity of pain perception following conventional surgery and CO2 laser in the treatment of leukoplakia; whereas, Kharadi et al. (13) showed complete lesion removal and minimal pain intensity according to the VAS scale after one month of treatment. Basha et al. (14) reported that neodymium-doped yttrium aluminium garnet (Nd:YAG)-laser, when used for gingival excoriation, presented significant improvement in VAS pain scores compared to surgical stripping after the first post-operative week. Braun et al. (15) compared the intensity of pain on the VAS among patients treated with Er:YAG laser and sonic scaling, and reported a greater decrease in pain scores in the group treated with lasers. Kara et al. (16) and Haytac et al. (17) reported that patients' experience of pain recorded on the VAS was lower following Nd:YAG- and CO2-laser frenectomy compared to scalpel surgery, respectively. In the study by Ferrante et al. (18), patients who received LLLT did not experience a significant reduction in pain compared with the 15 controls (No LLLT)

DISCUSSION

With reference to the effect of lasers in pain reduction among patients with oral premalignant lesions, controversial results have been reported (10-12). It is pertinent to mention that in the study by Ribeiro et al. (12) most of the lesions were between 20 mm and 50 mm. Post-operative pain is affected by the size of the excised lesion as the time between the inflammatory and granulation phase is longer in larger lesions.

With reference to the role of Nd:YAG lasers in gingival excoriation, it is hypothesized that the reduction in pain may be related to the sealing of the sensory nerves and coagulum formed on the wound surface following laser irradiation. Diode laser treatment of gingival hyperpigmentation has been demonstrated to be less painful than electrosurgery in the immediate post-operative period. In relation to the reduction in postoperative pain using Er:YAG lasers compared with sonic scaling, it has been suggested that the vibratory and acoustic component of the sonic scaling may have contributed to the increased pain perceived by these patients. The usual management of low frenum insertion consists of frenectomy using scalpel and blade under local anesthesia. However, laser use has demonstrated efficient cutting with no bleeding, no need of anesthetic, antibiotic or analgesics, faster recovery and reduced pain (19). It is likely that the decreased edema, possible sterilization of tissues which could reduce post-operative infections and decreased requirement for sutures, may contribute to reducing the overall pain experienced following diode laser therapy. As far as the role of lasers in reducing pain following third molar extraction is concerned, it is speculated that the difficulty level of the extractions could have influenced these conflicting outcomes. It is hypothesized that more complicated extractions, which require significant bone and tissue removal, may not be as responsive to laser irradiation for pain control. However, further studies are needed in this regard.

From the literature reviewed it is evident that LLLT is effective in the management of oro-facial pain compared to traditional procedures. However, it remains to be determined which particular wavelength will produce the more favorable and predictable outcome in terms of pain reduction. Moreover, it is highly recommended that further randomized control trials with well-defined control groups should be performed to determine the precise wavelengths of the diode lasers for the management of oro-facial pain. Within the limits of the present study, diode lasers therapy is more effective in the management of oro-facial pain compared to traditional procedures.

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