EVALUATION OF EFFECT OF LOW LEVEL LASER THERAPY POST THIRD MOLAR SURGERY: AN ORIGINAL RESEARCH

Dr. K. Pratyusha Lakshmi¹, Dr. Shadab Ali Baig², Dr. Sheffali Walia³, Dr. Vidya Priyadharshini⁴, Dr. T. Vigneswaran⁵, Dr. Firdos Sirajuddin Mazgaonkar⁶, Dr. Rahul VC Tiwari⁷

¹Reader, Department of Prosthodontics and Crown & Bridge, SVS Institute of Dental Sciences, Mahbubnagar, Telangana. pratyushakoganti@gmail.com
²Assistant Professor, Department of Oral and Maxillofacial Surgery, SCB Dental College & Hospital, Cuttack, Odisha, India. shadabalibaig@yahoo.com
³Senior Resident, Surendera Dental College & Research Institute, H. H. Gardens, Power House Road, Sri Ganganagar – 335 001, Rajasthan, INDIA. sheffaliwalia820@gmail.com
⁴Reader, Dept. Of Periodontics, JSSDCH, JSSAHER, Mysore-15. drvidyapd@yahoo.co.in
⁵M.D.S, Prof and HOD, Oral & Maxillofacial Surgery, RVS Dental college & Hospital, Coimbatore, Tamil Nadu. dratvignesh@gmail.com
⁶MDS, Assistant Professor, Department of Oral and Maxillofacial Surgery, Dr. G. D. Pol Foundation’s Y. M.T. Dental College and Hospital, Kharghar, Navi Mumbai. firdosm90@gmail.com
⁷OMFS, FOGS, (MHA), PhD Scholar, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, 384315. drrahulvctiwari@gmail.com

ABSTRACT

Introduction: The aim of this study is to evaluate the effect of the low-level laser therapy (LLLT) post the third molar surgery.

Material and methods: Hundred patients were randomized into two treatment groups, each with 50 patients—case (LLLT) and control. They were not on any medication one day before surgical extraction of the third molar. We used 980-nm diode-laser, using a 600-μm handpiece, intraorally (lingual and vestibular) at 1 cm from the involved area immediately after surgery in the case group. Routine management was done in the control group. Swelling, Pain and interincisal opening were assessed among the groups on days 1, 2 and seven.

Results: The laser group (cases) showed improvement in the interincisal opening and remarkable reduction of trismus, swelling and intensity of pain on the first and the seventh postoperative days.

Conclusion: We can conclude that LLLT, is useful for the reduction of postoperative discomfort after third-molar surgery.

Keywords: Extraction, Third molars, Low-level laser therapy,

I. INTRODUCTION

Third molar surgery is a common procedure performed by oral and maxillofacial surgeons. Surgical removal of an impacted third molar often involves postoperative pain, swelling, and loss of jaw function. The many factors that contribute to these situations are complex, but they originate from an inflammatory process that is initiated by surgical trauma. The pain reaches maximum intensity 3 to 5 h after surgery, continuing for 2 to 3 days, and gradually diminishing until the seventh day. Swelling reaches peak intensity in 12 to 48 h, resolving between the fifth and seventh day [1-4]. The biological effects of laser were first studied in 1967 and the laser therapy concept began in 1971 [1]. LLLT has been used for the prevention of swelling and trismus after the removal of impacted third molars, following periodontal surgery procedures, for reducing orthodontic postadjustment pain, as well as for the treatment of chronic facial pain, chronic sinusitis, gingivitis, herpes simplex, dentinal tooth hypersensitivity, and sensory aberrations in the inferior alveolar nerve [5]. Although LLLT has been used to prevent postoperative swelling and trismus after third-molar surgery, the results are controversial. This might be due to varying study designs,
differentiations or difficulties in the measurement of variables related to post-operative sequelae, as well as to different lasers and hand-piece types and different irradiation parameters [6-10]. The aim of this study is to evaluate the effect of the low-level laser therapy (LLLT) post the third molar surgery.

II. MATERIAL AND METHODS

Hundred healthy adult subjects were recruited into the study who had impacted lower third molar with III B surgical difficulty grade. Consent was taken from the subjects. We excluded those with systemic illness, pregnancy, and other acute conditions. We divided the subjects equally as the case and the controls. The experimental group received laser therapy, and the control group only routine management. The laser was applied intraorally (lingual and vestibular) at 1 cm from the involved area and extraoral at the insertion point of the masseter muscle immediately after surgery and at 24 h. A single operator performed the LLLT in all patients of the case group. In the study, a diode laser device with a continuous wavelength of 980 nm was used, and the laser therapy was applied by using a 600-μm handpiece. Laser energy was applied at 300 mW (0.3 W) for a total of 180 s, 60 s for each point (3), 0.3 W×180 s=54 J. The interincisal distance, Trismus, postoperative swelling, intensity of pain by the VAS method were measured on 1, 2, and 7 days postoperatively. The comparison was done by keeping the p<0.05 as significant.

III. RESULTS

We observed that on the first postoperative day, the average interincisal opening in the control group was 2.40±0.61 cm; in the LLLT group, it was 2.91±0.89 cm. On the seventh postoperative day, the average interincisal opening in the control group was 4.05±0.2 cm; in the LLLT group, it was 4.26±0.5 cm. Trismus in the LLLT group was significantly less than in the control group at the second and seventh postoperative days (p<0.05) (Fig. 1).

At the first postoperative day, the average swelling in the control group was 15.2±0.83 cm and in the LLLT group it was 14.2±1.0 cm. On the seventh postoperative day, the average swelling in the control group was 13.7±1.0 cm, in the LLLT group it was 13.6±1.0 cm. Postoperative swelling was significantly less in the LLLT group compared with the control group at first the postoperative day (p<0.05; Fig. 2). Intensity of pain was lower in the laser group than in the control group in all evaluations, but without statistically significant differences. In the control group the pain was 7.1, 7.0, 5.7 (VAS) in the LLLT group it was 3.75, 3.48 and 2.08 at 24 h, 48 h, 72 hrs (Fig. 3).

Fig. 1 Comparison of the interincisal opening among the groups.

Fig. 2 Comparison of the facial swelling among the groups.
In the previous studies LLLT has been reported to lower swelling and trismus following the removal of impacted third molars, there is no unison among the studies. All references to the use of laser therapy in the postoperative management of third molar surgery employ different methodologies, and in some, explanations as to selection of their respective radiation parameters are not given.[11-15] Various authors reported that soft-laser treatment had no beneficial effect on swelling and trismus after third-molar surgery. In all of these studies, the authors used different lasers at different power and dose, and all had applied the laser intraorally. We observed a significant reduction in the trismus among the cases and the controls. Carillo et al. [12] reported that the percentage of trismus in the laser group was significantly less than in the placebo group up to 7 days after surgery. In addition, they noted that helium–neon laser treatment had no beneficial effect on swelling after third-molar surgery. Postoperative swelling was significantly less in the LLLT group compared with the control group at first the postoperative day in our study. Similar to our study Roynesdal et al. [13] investigated the effect of soft-laser application on postoperative swelling and trismus, they carried out extraction of both lower third molars similarly impacted in two separate operations, irradiating unilaterally with a 6-J semiconductor laser at 830 nm, 40 mW, and found pain reduction—and decreases in swelling and trismus—at 9 h, without statistically significant differences. There was significant difference in the pain among the groups in our study. In comparison to our study Fernando et al. [16] carried out extraction of both lower third molars similarly impacted, using a laser semiconductor at 830 nm, 30 mW, with application intraorally at 4 J, at each surgical site in the experimental group. They reported pain and swelling levels at 24 and 72 h and on the seventh day, in addition to wound healing. There were no differences between groups in pain and swelling levels at 72 h, or in wound healing. The methodologies and results of these diverse studies are too varied to define the ideal parameters for use of the therapeutic laser or to evaluate its clinical effectiveness.

V. CONCLUSION

We can conclude that LLLT is useful for the reduction of postoperative trismus and swelling after third-molar surgery. The effects of LLLT are probably dependent on the method of its application.

REFERENCES