



**ANALGESIC EFFECT WITH LOWLEVEL LASER THERAPY AMONG SOFT TISSUE
LESION-AN ANALYTICAL STUDY WITH EVIDENCE**

S. S. Subramanian* and K. Lakshmi Prabha

¹Ph.D, Principal, Sree Balaji College of Physiotherapy.

²MPT, Asso.Prof, Sree Balaji College of Physiotherapy.

***Corresponding Author: S. S. Subramanian**

Ph.D, Principal, Sree Balaji College of Physiotherapy.

Article Received on 09/09/2021

Article Revised on 30/09/2021

Article Accepted on 20/10/2021

I. ABSTRACT

Pain management, a magic role what a physiotherapist, mostly concerned with. Being a non-pharmacological intervention with lesser period of exposure using low-level LASER therapy were lesser reported and researched, especially among subjects with soft tissue lesions. Findings of this research with lowering of pain can form foundation to further research with other physio modalities, such as ultrasound therapy, combining exercises with LASER therapy as major outcome of this study.

II. INTRODUCTION

Pain is the common problem all over the world irrespective of gender, age etc the causes of pain are so many and originated from nociceptive, neurological, inflammatory etc. Pain medication leading to negative effect on GI tract, Renal system etc Researchers are aiming to find out alternative to medication whenever possible are carried Globally.

Physiotherapy modalities, widely used to reduce pain as a nonpharmacological management. As an advancement of this, LOW LEVEL LASER (LLLT) therapy is currently accepted by various clinical experts. Low-level LASER therapy a promising one, with no known ill effects when applied with proper evaluation of patients.

Bio stimulation, Biomodulation and Bio synthesis action of low-level LASER is more effective to treat inflammatory condition for pain management.

KEYWORDS: LLLT-Low Level LASER therapy, NRS-numerical rating scale, LBA-low back ache, MSD-Musculoskeletal disorder, VAS-visual analogue scale, OA-Osteoarthritis,

III. AIMS AND OBJECTIVE

Objective of this study were to assess and evaluate the effect of LOW LEVEL LASER therapy on pain relief which was caused by soft tissue damage.

HYPOTHESIS

Low level LASER therapy has analgesic effect among soft tissue lesion.

IV. Materials and Methodology

Study ; Descriptive study
Study duration; 15 days weekly 5 days(july 2019-jan 2020)
Sample size; 59 with various soft tissue lesions
Study setup; Multispecialty hospital, Chennai
Sample selection; Convenient sampling

INCLUSION CRITERIA

Soft tissue lesion, both male and female, any age group, NRS pain rating more than 3, acute and chronic conditions.

EXCLUSION CRITERIA

Acute injuries like fracture and dislocation, autoimmune disorder, recent surgery, cancer, epilepsy, acute aemorage, vasculitis, non cooperative patients.

TOOLS OF MEASUREMENT

NRS Numerical rating scale; subjective rating scale from 0-10.

PROCEDURE

Patients who have attended physiotherapy clinic in Chennai were explained about the treatment and assessed for any contra indication specifically for LLLT.

Patients who have accepted for the treatment participated with consent letter. Patients were assessed for pain scale, using NRS, before the treatment session Depending upon the duration of pain and area, treatment time was allocated from 5 minutes to 15 minutes and treatment for 10 days. All patients were treated with 8j/cm² After

treatment session post test NRS score were measured and documented.

Table 1. Demographic details.

Age (years)	n(number of subject)	Distribution
10-20	2	3%
21-30	12	20%
31-40	9	15 %
41-50	14	24%
51-60	16	27%
61 AND ABOVE	6	10%
	59	59
MALE; 26 45%		FEMALE; 33 55%

Table 2: Duration of pain.

Duration	Number of subject	%
0-1WK	27	46%
2 WK	17	29%
3WK	10	17%
4WK and above	5	8%

Table 3: Distribution of subjects based on nature of clinical conditions.

REGION	M	%	F	%
KNEE	-		7	12%
TENDINITIS	20	34%	19	34%
SHOULDER	3	5%	-	
LBA	2	3%	3	5%
COCCYDYNIA	-		2	3%
ACC NAVICULAR	-		1	2%
TRISMUS	1	2%	-	
CAL SPUR	-		1	2%

V. Results and post LOW LEVEL LASERTHERAPY using NRS.

Table 4: Table of results –Prognosis.

No	No of days	%	Pre Test Score >6	Post Test Score '0'	pre Test Score >6	Post Test Score 1	pre Test Score >6	Post Test Score 2	Pre Test Score >6	Post Test Score 3	Pre Test Score >7	Post Test Score 4	pre Test Score >7	Post Test Score 5
41	10	69.9		41										
10	10	16.9				10								
3	10	5.08						3						
2	10	3.38							2					
2	10	3.38	These patients are known chronic and improved after 5 more days									2		
1	10	1.69	This patient improved after 5 more sittings											1
59														

VI. DISCUSSION

Non pharmacological means of pain management, Bindings of this study can be of greater contribution. As evidenced scientifically pain, arising from multiple sources, among both gender and different age groups can lessen productivity any subject's availability of life.

Effect of pain on joints;

Subjects with shoulder tendinopathy in a systematic review by Leethy et al 2020 on LLLT with pain reduction from 45% of the studies; but further studies to

recommend dosage and addictive effects of exercise with LLLT in the treatment of LLLT. However 6% subjects in this research with shoulder tendinopathy have an improved VAS and function.

LLLT ON OSTEOARTHRITIS OF KNEE

Stausholm et al 2019 in a systematic review of LLLT on OA Knee with reduction of pain and disability, where as didn't analyse the role of QOL, similar this research where only NRS was used only for reduction of pain

among 11.8% subjects with OA Knee, but further studies can validate the effects of LLLT on QOL.

Bjordal et al 2011 in an RCT have recorded Anti-inflammatory effects of LLLT in Achilles Tendinopathy with an increased blood flow and decreased inflammation using Doppler ultrasound and measuring prostaglandin E2.

Whereas this research where 10% of subjects with Achilles Tendinopathy have benefited with LLLT with above supported research and means.

EFFICACY OF PAIN OVER JOINTS

Jang et al 2012 in a Meta - analysis on pain relief effects by LASER on joint areas to reduce pain, while they have suggested to restrict energy doses of LASER therapy in to the dose window, could have more reliable pain relief.

Further Bjordal et al 2003 in a systematic review on usage of LASER in joint diseases recommended proper selection of energy dose to have Anti-inflammatory effect.

Though this study didn't have control on disease wise selection of energy dose with LLLT, further studies can be carried for better results.

CO – INTERVENTIONS WITH LLLT

While using LASER therapy combining with exercises NSAID and other physical therapies, were found to be productive as supported by (Djavid et al, 2007) and co – interventions were found to be ineffective by (Meireless et al, 2010) and few research who have not used any co - intervention as recorded by (Hegedus et al, 2009).

Whereas this research only LASER therapy was used with no co – intervention, but further RCT studies comparing effectiveness of LLLT with co – intervention are planned in the coming year.

LLLT IN TENDINOPATHY

Nogueira Junior et al 2011 in a Systematic review on LASER in Tendinopathy have concluded LLLT to be effective than placebo but with consistent results were demonstrated.

With an increased incidence of Tendinopathy subjects of 30% among MUSCULOSKELETAL DISORDERS (5) along with sedentary life style (6) further age and gender were found to be contributing factors (7) LLLT on lateral epicondylitis with reduction of inflammation due to angiogenesis and increased collagen synthesis as reported by Tumilty et al 2010.

This research subjects with 15 % of Epicondylitis might have benefited with the above said mechanism.

Bjordaletal 2011 in an RCT have recorded anti-inflammatory effects of LLLT in Achilles tendinopathy

with an increased blood flow and decreases inflammation using Doppler ultrasound and measuring Prostaglandin E2.

whereas this research where 12% of subjects with Achilles tendinopathy have benefited with LLLT with above supported research and means.

Tomazoni et al, have compared in rats with knee OA using NSAID and LLT have recorded reduced expression of proinflammatory cytokines and prostaglandin E2 significantly more than NSAID. Thus, indicating benefit from ill effects of drugs (5) by subjects treated with LLLT but subjects with major knee OA were not recommended with LLLT as recommended by European league guidelines on Rheumatism OA Guidelines.

Efficacy of LLLT among women and geriatric

Rayeganietal 2012 have a reduction in VAS by 63mm among geriatric women >61 years; using 2 weeks of LLLT and an improved WOMAC which was supported by similar findings by Tasioglu,etal 2004 among geriatric women with lowering of VAS by 68mm. Further Stergioulars,etal 2019 have recorded in a systemic review on LLLT with a significant reduction in LLLT and disability with LLLT, in 2-4 weeks follow up but this research of geriatric subject 11% with pretest score 8-reduction of NRS by 1 and especially among - 11% of women participants have benefited by 90%

Efficacy of LLLT on Diabetic subjects

Shashikumar etal 2015 have reported among 19 Type 2 diabetic Indian subjects lowering of VAS in 10 sessions with LLLT having 12% of this research subjects being type 2 diabetics have benefited with LLLT as reduction in pain similar to the above study could be due to reduction in interleukin-1 (chen etal, 2012) and an increased angiogenesis (melo etal, 2011).

VIII CONCLUSION

Low level LASER to be effective in minimizing pain among subjects with soft tissue lesion was found to be effective from this study finding. However lesser sample size with those variables and RCT can further validate more scientifically.

Limitations of this study

Role of exercises were not discussed. Role of medication were not discussed and follow-up of these subjects on sustaining analgesic relief were lacking in this research.

REFERENCES

1. Merskey H, Bagduk N. Classification of Chronic Pain. International Association for the Study of Pain (IASP) 1994. Part III: Pain terms, a current list with definitions and notes on usage.
2. Kim RP, Edelman SV, Kim DD. Musculoskeletal complications of diabetes mellitus. Clin Diabetes, 2001; 19(3): 132-5.

3. Jan Magnus Bjordal¹, Mark I Johnson, Vegard Iversen, Flavio Aimbire, Rodrigo Alvaro Brandao Lopes-Martins, in Low-level LASER therapy in acute pain RCT may 2006, Photo medicine and LASER surgery journal.
4. S Peter Magnusson¹, Mette Hansen, Henning Langberg, Ben Miller, Bjarki Haraldsson, Eva Kjoeller Westh, Satu Koskinen, Per Aagaard, Michael Kjaer. The adaptability of tendon loading differs in Men and Women; IJEXP, 2007; 88.
5. Stergioulas A. Low-power LASER treatment in patients with frozen shoulder: preliminary results. Photomed LASER Surg, 2008; 26(2): 99-105.
6. Béla Hegedus¹, László Viharos, Mihály Gervain, Márta Gálfi. The effect of low-level LASER in knee OA, by, Photomedicine and LASER surgery, 2009; 27.
7. Abeer A. Yamany Hayam M. Sayed. Effect of low-level LASER therapy on neurovascular function of diabetic peripheral neuropathy February, 2011.
8. Yusuke Morimoto, MD PhD, Akiyoshi Saito, and Yasuaki Tokuhashi. In Low Level LASER therapy for sports injuries LASER therapy journal, 2013.
9. Ayman s soliman, Ayman M mahmoud, Zahra MH Serry, Fady G Dawood. Therapeutic effects of low-level LASER and reflexology on adhesive capsulitis in elderly type 2 diabetic patients, 2014; 7(5).
10. Cotler HB, Chow RT, Hamblin MR, Carroll J. The use of low-level LASER therapy (LLLT) for musculoskeletal pain. MOJ Orthop Rheumatology, 2015; 2(5): 00068.
11. Kumar C G, S., Maiya, A. G., Hande, H. M., Vidyasagar, S., Rao, K., & K.V. Efficacy of low level LASER therapy on painful diabetic peripheral neuropathy. LASER THERAPY, 2015; 24(3).
12. Shashi Kumar Cg¹, Arun G Maiya, H Manjunath Hande, Sudha Vidyasagar, Karthik Rao, K V Rajagopal. In LASER therapy 2015. Efficacy of LLLT on painful diabetic peripheral neuropathy.