

Clinical Trial > J Photochem Photobiol B. 2015 Dec;153:103-10.

doi: 10.1016/j.jphotobiol.2015.08.026. Epub 2015 Sep 2.

Can low-level laser therapy (LLLT) associated with an aerobic plus resistance training change the cardiometabolic risk in obese women? A placebo-controlled clinical trial

Fernanda Oliveira Duarte ¹, Marcela Sene-Fiorese ², Antonio Eduardo de Aquino Junior ³, Raquel Munhoz da Silveira Campos ⁴, Deborah Cristina Landi Masquio ⁴, Lian Tock ⁵, Ana Claudia Garcia de Oliveira Duarte ⁶, Ana Raimunda Dâmaso ⁴, Vanderlei Salvador Bagnato ⁷, Nivaldo Antonio Parizotto ³

Affiliations + expand

PMID: 26398817 DOI: 10.1016/j.jphotobiol.2015.08.026

Abstract

Introduction: Obesity is one of the most important link factors to coronary artery disease development mainly due to the pro-inflammatory and pro-thrombotic states favoring atherosclerosis progression. The LLLT acts in the cellular metabolism and it is highly effective to improve inflammation. The same occur in response to different kinds of exercise. However, we have not known the associate effects using LLLT therapies with aerobic plus resistance training as strategy specifically with target at human obesity control and its comorbidities.

Objective: Investigate the effects of the LLLT associated with aerobic plus resistance training on cardiometabolic risk factors in obese women.

Methodology: Women aged 20-40 years (BMI ≥ 30 kg/m(2)), were divided into 2 groups: Phototherapy (PHOTO) and Placebo. They were trained aerobic plus resistance exercises (in a concurrent mode), 1h, 3 times/week during 16 weeks. Phototherapy was applied after each exercise session for 16 min, with infrared laser, wavelength 808 nm, continuous output, power 100 mW, and energy delivery 50 J. The body composition was measured with bioimpedance. Inflammatory mark concentrations were measured using a commercially available multiplex.

Results: LLLT associated with aerobic plus resistance training was effective in decrease neck (P=0.0003) and waist circumferences (P=0.02); percentual of fat (P=0.04); visceral fat area (P=0.02); HOMA-IR (P=0.0009); Leptin (P=0.03) and ICAM (P=0.03). Also, the reduction in leptin (P=0.008) and ICAM-1 (0, 05) was much more expressive in the phototherapy group in comparison to placebo group when analyzed by delta values.

Conclusion: LLLT associated with concurrent exercise (aerobic plus resistance training) potentiates the exercise effects of decreasing the cardiometabolic risk factors in obese woman. These results suggest the LLLT associated with exercises as a new therapeutic tool in the control of obesity and its comorbidities for obese people, targeting to optimize the strategies to control the cardiometabolic risk factors in these populations.

Keywords: Aerobic exercise; Cardiometabolic risk; Inflammation; Low-level laser therapy (LLLT); Obesity; Resistance exercise.

Copyright © 2015 Elsevier B.V. All rights reserved.

Similar articles

[The effects of exercise training associated with low-level laser therapy on biomarkers of adipose tissue transdifferentiation in obese women.](#)

da Silveira Campos RM, Dâmaso AR, Masquio DCL, Duarte FO, Sene-Fiorese M, Aquino AE Jr, Savioli FA, Quintiliano PCL, Kravchychyn ACP, Guimarães LI, Tock L, Oyama LM, Boldarine VT, Bagnato VS, Parizotto NA. Lasers Med Sci. 2018 Aug;33(6):1245-1254. doi: 10.1007/s10103-018-2465-1. Epub 2018 Feb 23. PMID: 29473115 Clinical Trial.

[Low-level laser therapy \(LLLT\) associated with aerobic plus resistance training to improve inflammatory biomarkers in obese adults.](#)

da Silveira Campos RM, Dâmaso AR, Masquio DC, Aquino AE Jr, Sene-Fiorese M, Duarte FO, Tock L, Parizotto NA, Bagnato VS. Lasers Med Sci. 2015 Jul;30(5):1553-63. doi: 10.1007/s10103-015-1759-9. Epub 2015 May 10. PMID: 25958170 Clinical Trial.

[The potential of phototherapy to reduce body fat, insulin resistance and "metabolic inflexibility" related to obesity in women undergoing weight loss treatment.](#)

Sene-Fiorese M, Duarte FO, de Aquino Junior AE, Campos RM, Masquio DC, Tock L, de Oliveira Duarte AC, Dâmaso AR, Parizotto NA, Bagnato VS. Lasers Surg Med. 2015 Oct;47(8):634-42. doi: 10.1002/lsm.22395. Epub 2015 Jul 29. PMID: 26220050 Clinical Trial.

[In middle-aged and old obese patients, training intervention reduces leptin level: A meta-analysis.](#)

Rostás I, Pótó L, Mátrai P, Hegyi P, Tenk J, Garami A, Illés A, Solymár M, Pétervári E, Szűcs Á, Párniczky A, Pécsi D, Rumbus Z, Zsiborás C, Fűredi N, Balaskó M. PLoS One. 2017 Aug 15;12(8):e0182801. eCollection 2017. PMID: 28809927 Free PMC article. Review.

[Effects of Mode and Duration of Exercises on Fat Mass of Obese Population.](#)

Hassan B, Farooqui SI, Khan MU, Farhad A, Adnan QUA. J Coll Physicians Surg Pak. 2020 Apr;30(4):412-416. doi: 10.29271/jcpsp.2020.04.412. PMID: 32513363 Review.

[See all similar articles](#)

Cited by 5 articles

[Study protocol for the use of photobiomodulation with red or infrared LED on waist circumference reduction: a randomised, double-blind clinical trial.](#)

Marreira M, Rocha Mota L, Silva DFT, Pavani C. BMJ Open. 2020 Aug 11;10(8):e036684. doi: 10.1136/bmjopen-2019-036684. PMID: 32784257 Free PMC article.

[Photobiomodulation of the microbiome: implications for metabolic and inflammatory diseases.](#)

Bicknell B, Liebert A, Johnstone D, Kiat H. Lasers Med Sci. 2019 Mar;34(2):317-327. doi: 10.1007/s10103-018-2594-6. Epub 2018 Aug 3. PMID: 30074108

[The effects of exercise training associated with low-level laser therapy on biomarkers of adipose tissue transdifferentiation in obese women.](#)

da Silveira Campos RM, Dâmaso AR, Masquio DCL, Duarte FO, Sene-Fiorese M, Aquino AE Jr, Savioli FA, Quintiliano PCL, Kravchychyn ACP, Guimarães LI, Tock L, Oyama LM, Boldarine VT, Bagnato VS, Parizotto NA. Lasers Med Sci. 2018 Aug;33(6):1245-1254. doi: 10.1007/s10103-018-2465-1. Epub 2018 Feb 23. PMID: 29473115 Clinical Trial.

[When is the best moment to apply photobiomodulation therapy \(PBMT\) when associated to a treadmill endurance-training program? A randomized, triple-blinded, placebo-controlled clinical trial.](#)

Miranda EF, Tomazoni SS, de Paiva PRV, Pinto HD, Smith D, Santos LA, de Tarso Camillo de Carvalho P, Leal-Junior ECP. Lasers Med Sci. 2018 May;33(4):719-727. doi: 10.1007/s10103-017-2396-2. Epub 2017 Nov 29. PMID: 29185134 Clinical Trial.

[Low-level laser therapy \(LLLT\) does not reduce subcutaneous adipose tissue by local adipocyte injury but rather by modulation of systemic lipid metabolism.](#)

Jankowski M, Gawrych M, Adamska U, Ciescinski J, Serafin Z, Czajkowski R. Lasers Med Sci. 2017 Feb;32(2):475-479. doi: 10.1007/s10103-016-2021-9. Epub 2016 Jul 6. PMID: 27384041 Free PMC article. Clinical Trial.

Publication types

- > Clinical Trial
- > Randomized Controlled Trial
- > Research Support, Non-U.S. Gov't

MeSH terms

- > Adult
- > Blood Glucose / analysis
- > Body Mass Index
- > Double-Blind Method
- > Enzyme-Linked Immunosorbent Assay
- > Exercise
- > Female
- > Humans
- > Insulin / blood
- > Intercellular Adhesion Molecule-1 / blood
- > Lasers
- > Leptin / blood
- > Low-Level Light Therapy*
- > Obesity / radiotherapy*
- > Placebo Effect
- > Young Adult

Substances

- > Blood Glucose
- > Insulin
- > Leptin
- > Intercellular Adhesion Molecule-1

Related information

- MedGen
- PubChem Compound (MeSH Keyword)

LinkOut - more resources

- Full Text Sources
- Elsevier Science
- Medical
- MedlinePlus Health Information
- Miscellaneous
- NCI CPTAC Assay Portal

FULL TEXT LINKS



ACTIONS

- “ Cite
- Favorites

SHARE



PAGE NAVIGATION

< Title & authors

Abstract

Similar articles

Cited by

Publication types

MeSH terms

Substances

Related information

LinkOut - more resources

