

◆ Abstract

Obesity is a result of homeostasis energy disturbance. Low-level laser acupuncture with their homeostatic activities may primarily compensate for this disturbance. The purpose of this study was to investigate the efficacies of laser acupunctures with different laser irradiation doses for body contouring, weight loss and body fat reduction in obese female undergraduate students. Twenty eight subjects with simple obesity were divided into four groups receiving laser acupunctures at 0, 358, 478, and 597 J/cm², respectively six times per week for four weeks. Body weight (BW), body mass index (BMI), body fat mass (BFM), body fat percent, waist girth, hip girth, and waist-to-hip ratio (WHR) were measured before and after treatment. Results showed that laser acupuncture could reduce body fat mass and lower body weight in a dose-dependent manner in obese persons. Among the doses of 358, 478, and 597 J/cm², both the 358 and 597 J/cm² doses were effective in the 4-week trial.

◆ Aim of The Study

This study is aimed to investigate the efficiency of laser acupunctures with GaAlAs laser irradiation at different doses for body weight loss and body fat reduction in obese humans on a blinded clinical trial.

◆ Methods & Materials

Twenty eight undergraduate female students with simple obesity (obesity criteria according to WHO for Asin-Pacific region: body mass index (BMI) ≥ 25 Kg/m²; Body fat percent $\geq 30\%$) were divided randomly into four groups, seven in each group. The four groups were placebo, low-, medium-, and high-laser dose. Each student was asked to not change her diet or habits during the study.

A GaAlAs laser (Model LD-1, Guangzhou, China) with 810nm wavelength, 0~500mW adjustable and continuous power output, and with 0.4 cm beam diameter was used (Fig. 1). The students in the placebo, the low-dose, the medium-dose, and the high dose groups were treated with the laser at the doses of 0, 358, 478, and 597 J/cm² (powers: 0, 150, 200, and 250mW; intensity: 0, 1194, 1592, and 1990 mW/cm²; irradiation time: 5min/point, 25min in total) respectively, six times per week for four weeks at the Laboratory of Laser Sports Medicine of South China Normal University in Guangzhou.. The laser irradiations were applied directly to the skin of the five selected with a perpendicular beam.

Body weight (BW), BMI, body fat mass (BFM), body fat percent, waist girth, hip girth, and waist-to-hip ratio (WHR) were measured at baseline and the end of treatment. BW, BMI, BFM, and body fat percent were measured using the body

composition analyzer (Model In body 3.0, Republic of Korea).



Fig. 1: GaAlAs laser used for low level laser therapy (zerona)

◆ Results

-Body Weight (BW) [Kg]

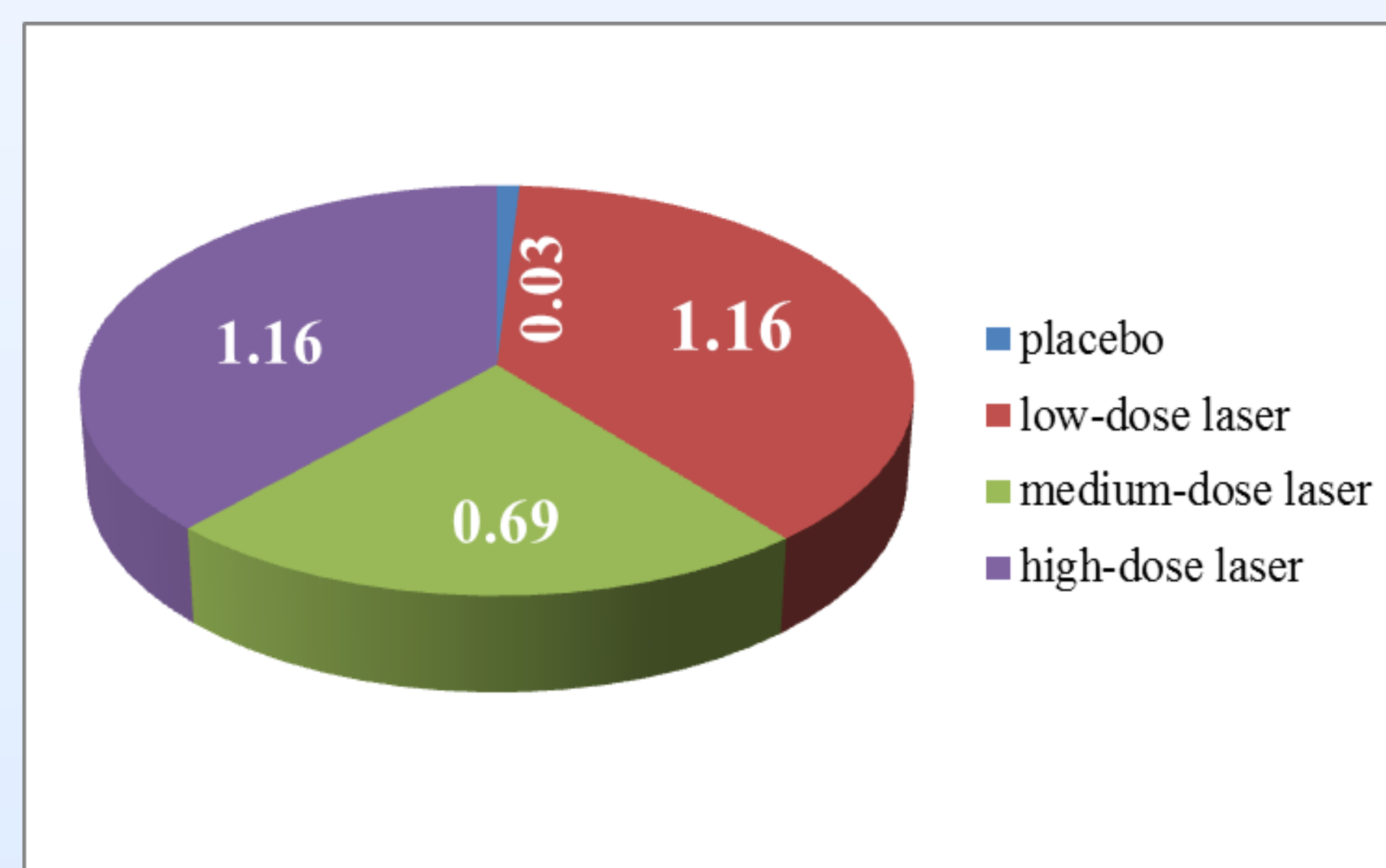


Fig. 2: The change of body weight over time of study for different laser doses

-Body Mass Index (BMI) [Kg/m²]

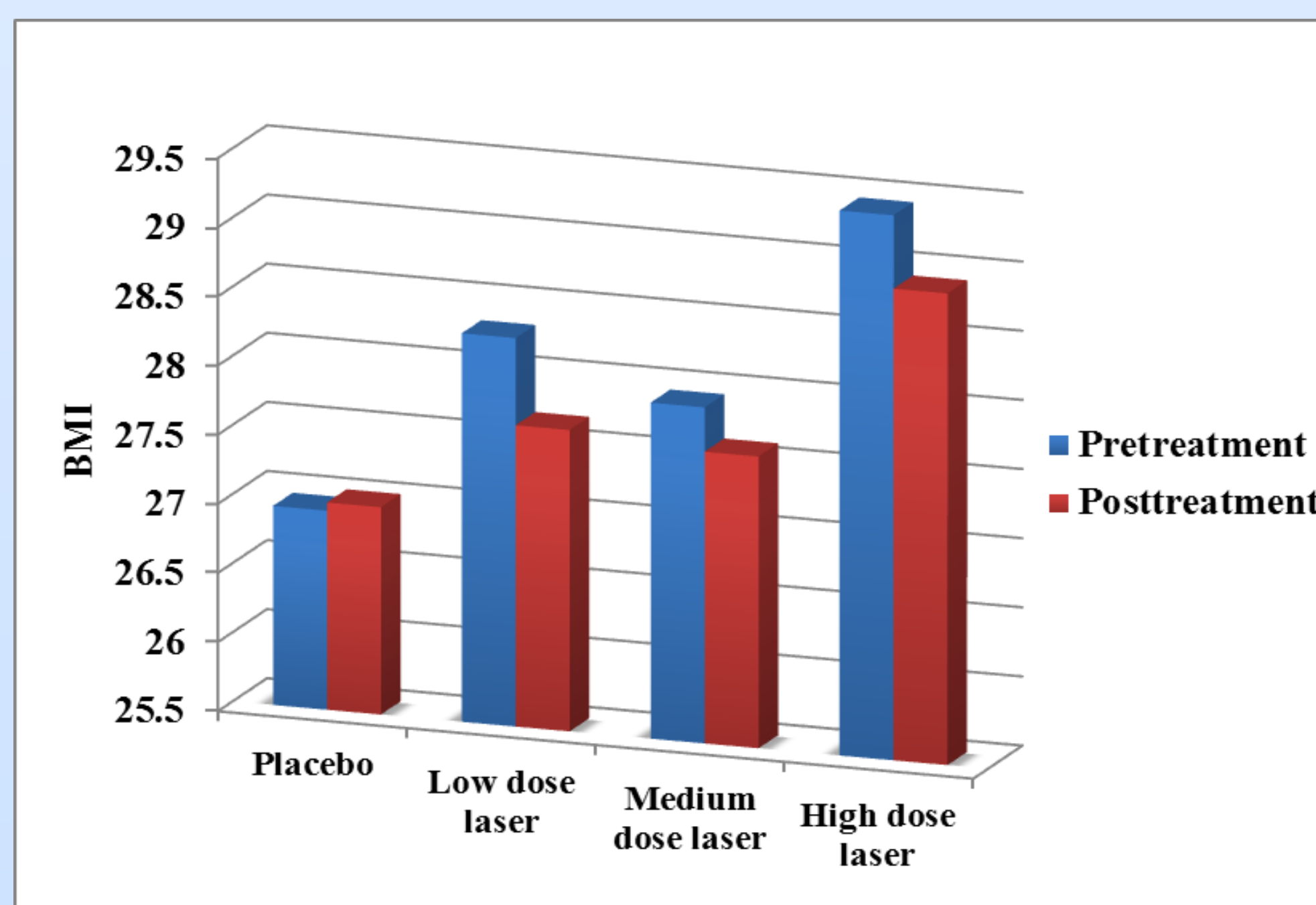


Fig.3: The body mass index for pre- and post-treatment at different laser doses

-Body Fat Mass (BFM) [Kg]

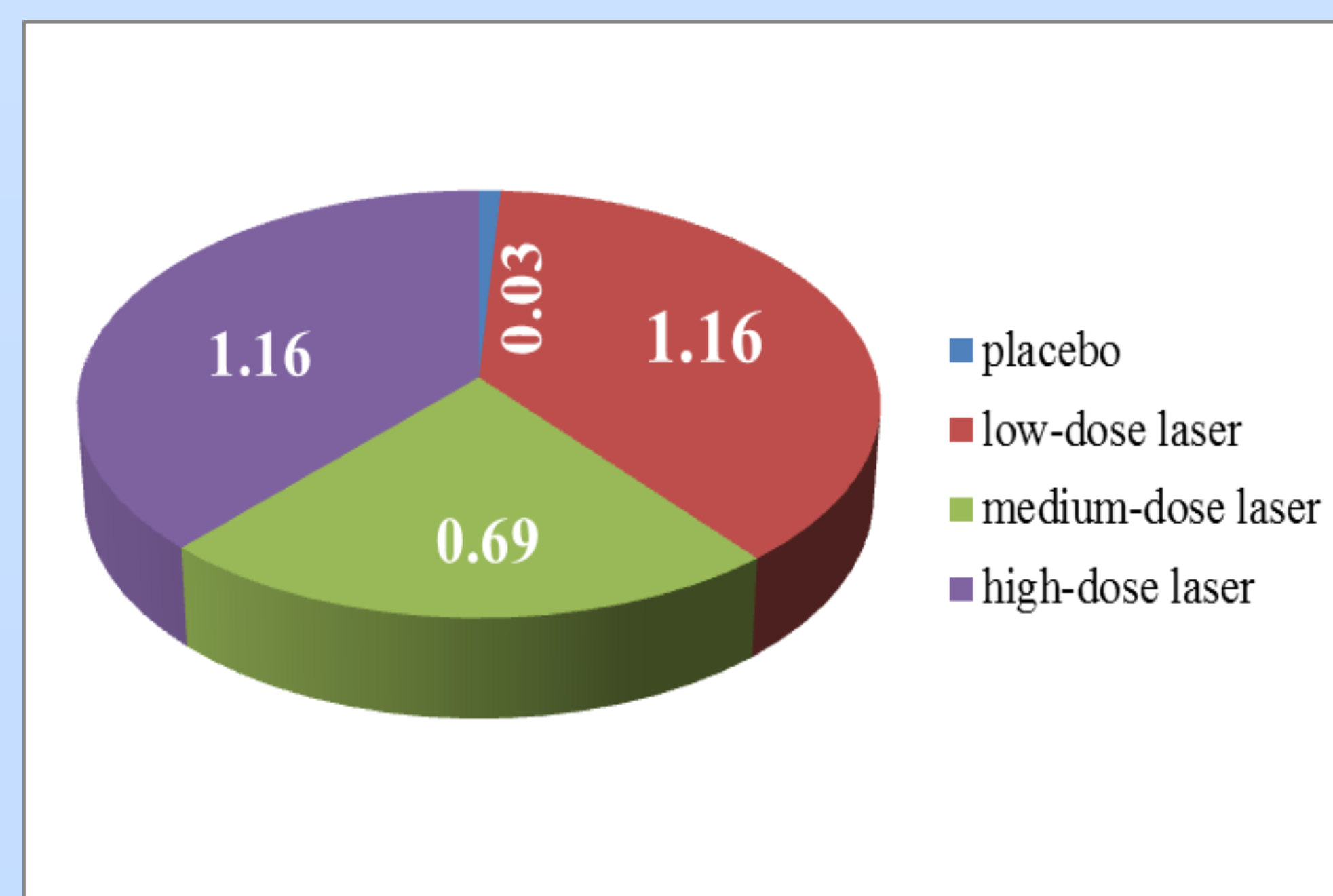


Fig. 4: The change of body fat mass over time of study for different laser doses

-Body Fat Percent (BF%)

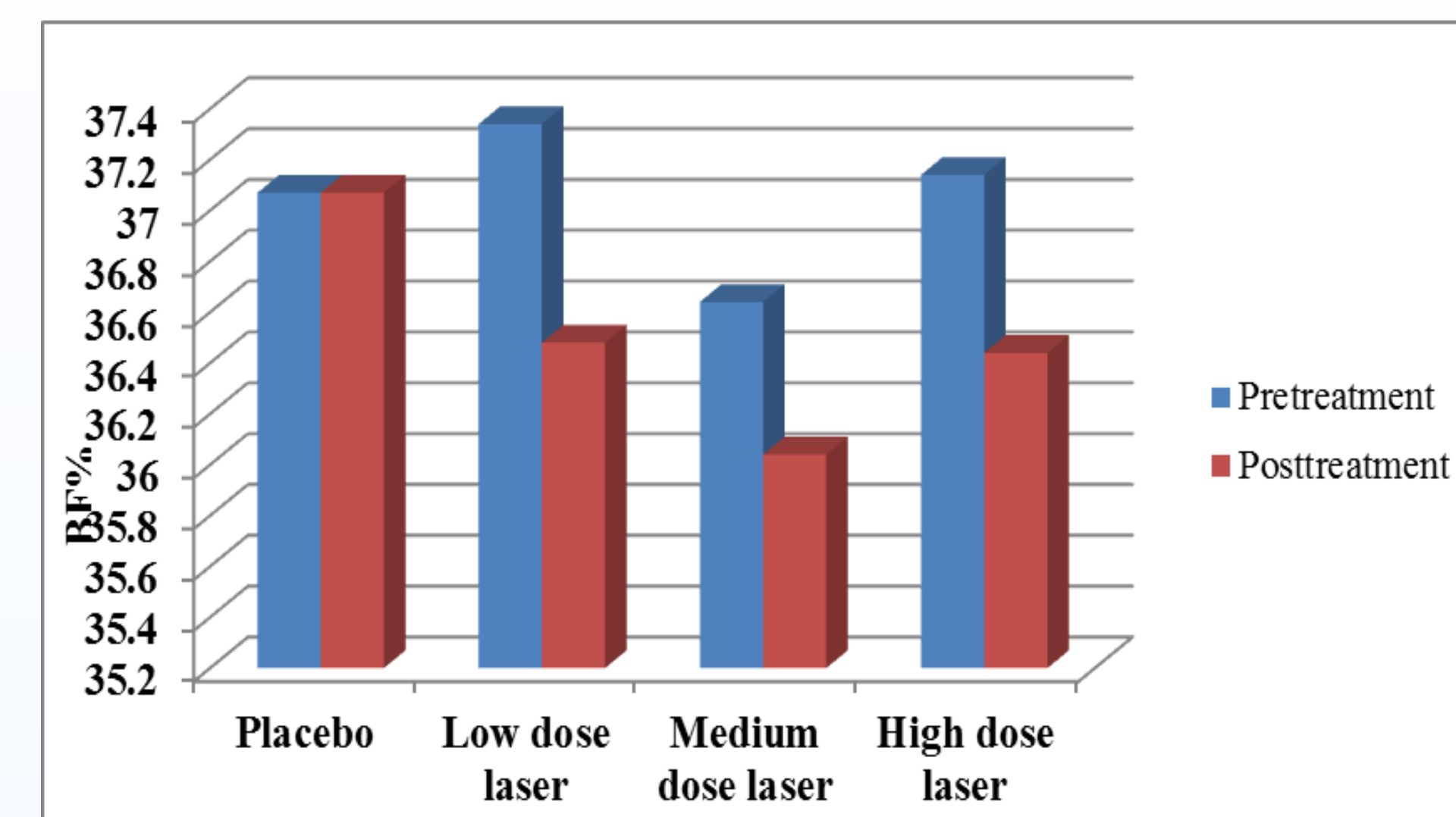


Fig.5: The body fat percent for pre- and post-treatments at different laser doses

-Waist-to-Hip Ratio (WHR)

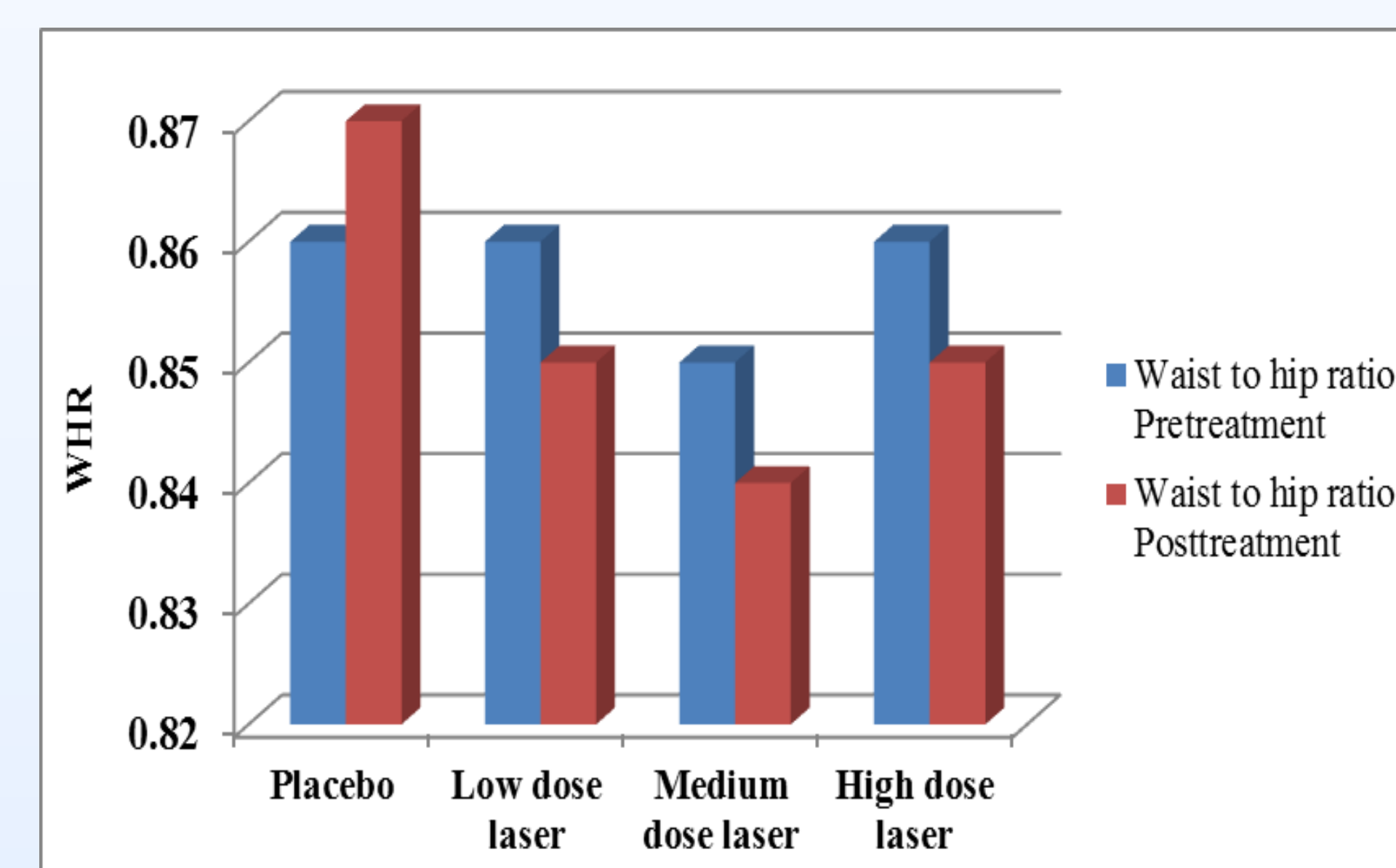


Fig.6: The waist-to-hip ratio pre- and post-treatments at different laser doses

◆ Conclusion

Obesity became a serious problem overall the world especially in Arab countries, since it is associated with many diseases such as diabetes and some cancers.[1]

Over the last 30 years the low level laser therapy (LLLT) has been applied in many medical fields, in addition to the acupuncture. Laser acupuncture showed a good results alone in weight reduction of obese persons.[2]

In this study, results showed that the laser acupuncture with 810nm GsAlAs laser irradiation at both the low dose of 358 J/cm² and the high dose of 597 J/cm² significantly reduces BFM as well as BW in obese students, however, In the low dose and high-dose groups, the percent reduction was greater in BFM than in BW since laser affect on BMF not water.

Among the doses of 358, 478, and 597 J/cm², both the 358 and 597 J/cm² doses were effective in the 4-week trial.

◆ References

- [1] Liu Xiao-G., Zhang J., Lu Jian-L.,and Liu T.C., 2012. Laser Acupuncture Reduces Body Fat in Obese Female Undergraduate Students, Int. J. Photonenergy; article ID:730351.
- [2] Avci P., Nyame T.T., Gupta G.K., Sadasivam M., and Hamblin M.H., 2013. Low-Level Laser Therapy for Fat Layer Reduction: Acomprehensive Review, Laser in Surgery and Medicine; 45:349.

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