Epilation results comparison: diode laser versus IPL. The effectiveness of diode laser epilation following non-coherent light therapy.

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INTRODUCTION

Unwanted growth of hair on parts of the body parts is a frequent concern in females and males. Unwanted body hair can be reduced permanently using light assisted devices such as IPL and Lasers and these treatments has become more popular for its long-lasting effect. Nowadays there are various devices available for hair removal, including 755 nm alexandrite, 800-810 nm diode, and 1064 nm Nd:YAG lasers, and intense pulsed light (IPL) systems. Among available lasers, the 800-810 nm long-pulsed diode laser is one of the most commonly used devices. In here light is less absorbed by epidermal melanin therefore it is effective even on darker skin types. The efficacy of light assisted hair reduction is determined with various physical parameters, including the wavelength, pulse duration, fluence, spot size, treatment interval, and number of treatment sessions, as well as by the patient's individual characteristics, such as skin colour, hair colour, hair thickness, and the treated area of the body. Very often patients are using IPL- even at their own home to reduce unwanted hair. To evaluate the impact of IPL treatments on the diode laser efficiency in hair reduction, we compared the outcomes of axillary hair reduction in three groups by using IPL assisted device prior to the use of diode laser under the condition that fluence, pulse duration are as per manufacturers guidelines, epidermal cooling temperature and environmental temperature are identical.

STUDY AIM

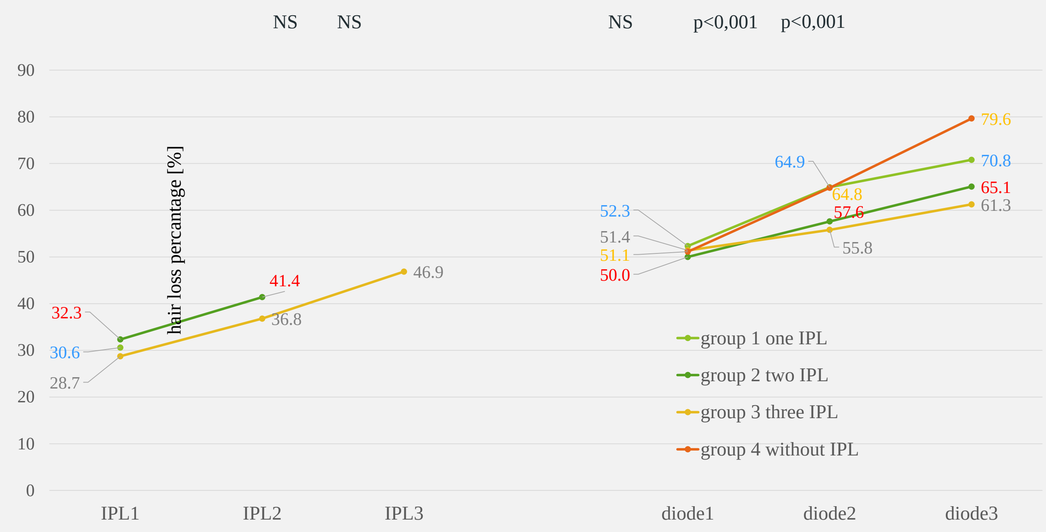
The objective of this study was to compare the results of epilation treatments by laser and by IPL and to rate the effectiveness of diode laser epilation following non-coherent light therapy.

MATERIALS AND METHODS

- The study was carried out in a clinic in Krakow (Poland) from July 2017 to February 2019.
- 805nm diode laser with the following parameters, Fluence :32-36 J / cm2 , Pulse duration 30 ms- 100 ms, Frequency: 2.31-2.54 Hz, 9x9 mm handpiece.
- IPL device with a wavelength of 640-1200nm, Fluence:28 - 34J / cm2 , Pulse duration 5ms -30ms,
- All settings adjusted according to skin response to the patch test settings
- 45 healthy females, 21- 23 years old, Skin type II-III took part in the study. Informed consent for participation and treatment obtained during consultation. No hair maintaince in area of the treatment used during duration of the study.
- The participants were divided into three groups of 15:
- I – one IPL treatment followed by three diode laser treatments.
- II – two IPL treatments followed by three diode laser treatments.
- III- three IPL treatments followed by three diode laser treatments.
- Each participant received hair removal treatment on armpits being randomly assigned to the right or left axilla for IPL course of treatments followed by diode laser.
- Other axilla was treated three times with diode laser for as a control for comparison
- Hair reduction was quantified with high-resolution digital photos (zoom x20) taken shortly before each of the treatments and six weeks after last treatment. The number of hairs in each photo was counted by using magnified screen images.
- Three evaluators, independently counted the number of hairs and the mean value was used for the evaluation.
- To keep the evaluators blind, no information was given about the participants, the axillary side, or the chronology of the photographs. Hair reduction from each axilla, a main outcome measure in this study, was defined as the number of removed hairs divided by the number of initial axillary hairs, and expressed as a percentage.
- Postprocedural assessment was quantified on a visual analogue scale (VAS) ranging from 0 to 3, six weeks after the last session where 0 meant- hairs is thicker, 1 meant- no results observed, 2 meant – hairs thinner, 3 meant hairs thinner and weaker.
- Subjective satisfaction scale was used where1 - meant the tretment did not meet my expectations, 2 - lack of satisfaction of the treatment effect, 3 - moderate contentment, 4 - satisfying effects, 5 - the treatment has met all my expectations.
- Adverse events were evaluated at each visit by means of physical examination and through the patients' self-report.

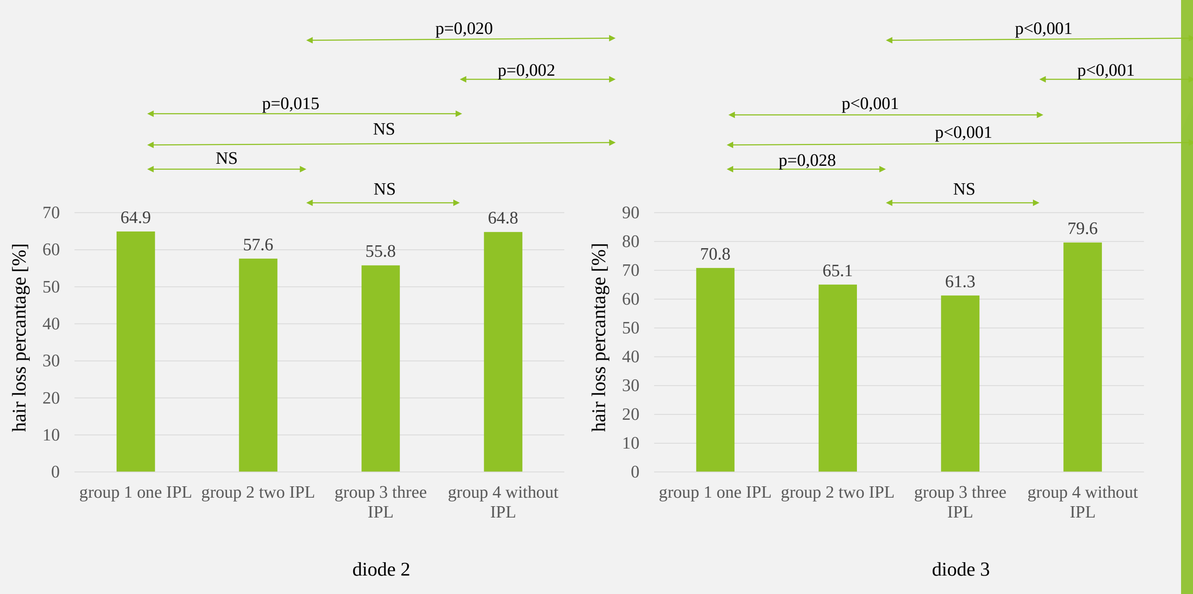
RESULTS : ANOVA

- There were no statistically significant differences in hair loos percentage between the study groups after one and two IPL treatments
- There were no statistically significant differences in hair loos percentage between the study groups after the first diode treatment
- After the second treatment using diode laser significant differences in the hair loos percentage is shown between the 4 groups (p <0.001).
- After this treatment, the biggest hair loos percentage is noticed in control group- without IPL (64.8%) and in group I with one IPL (64.9%) and the lowest in group III where diode treatments were preceded by three IPL treatments (55, 8%)
- After the third diode laser treatment, significant differences in the hair loos percentage between the studied groups (p <0.001) was shown. After this procedure, the largest hair loos percentage occurred in control group - without IPL (79.6%) and the smallest in the group III in where diode laser treatments were preceded by three IPL treatments (61.3%)



RESULTS: TUKEY'S POST HOC TEST

- The second diode laser treatment shows no significant differences between compared groups I:IV, I: control, II:III (Figure 2)
- The third laser treatment shows no significant differences between compared groups II :III



CONCLUSIONS

- ✓ IPL assisted treatments done prior to the diode laser hair reduction treatments have the negative impact on t the diode laser effectiveness
- ✓ This is linked with the way how non-coherent light weakens and thins the hair which impedes the absorption of laser light by melanin and adversely affects treatment results.
- ✓ Larger was number of the IPL assisted treatments- smaller diode laser assisted hair loss percentage.

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