

## **Efficacy of Intense Pulsed Light in Treatment of Striae Distensae in Thai**

Dr. Doojduean Srimukda<sup>1</sup>

Dr. Siriwan Kooramasuwan<sup>2</sup>

Dr. Ariya Sarikaputi<sup>3</sup>

### **Abstract**

Striae distensae caused by stretching of the skin is a common problem and found in multiple locations. There are several methods of treatment, but does not work perfectly. Intense Pulsed Light can activate collagen synthesis therefore it could be useful for striae alba.

**Objective:** To study the effectiveness of the Intense Pulsed Light in the treatment of striae alba.

**Methods:** Volunteers aged 20 years up had been diagnosed as striae alba were treated of striae on one side with Intense Pulsed Light, five times every two weeks, compared to no treatment side. Evaluated by taking photo, measuring width of striae and evaluating scores of patient satisfaction.

**Results:** In treatment of striae alba in the same treatment side by IPL, the average width of striae alba before and after treatments were significantly different since the 3<sup>rd</sup> and 4<sup>th</sup> treatment ( $p < 0.05$ ).

However, when we compared the average width of the treatment sides and control sides in the 2<sup>nd</sup> to 4<sup>th</sup> treatment, we have found no significant difference. Side effects included hyperpigmentation, sales and burn which gradually disappeared after the treatment.

**Conclusion:** Intense Pulsed Light can be used to treat striae alba which is proven by decreased size of striae alba. However, this should be a long-term follow-up which considered as a guideline to treat striae distensae. The method could combine with other methods in order to increase the efficiency of treatment of striae distensae.

**Keyword :** Intense Pulsed Light ,Striae distensae

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<sup>1</sup> Graduate Student, Master of Science in Anti-Aging and Regenerative Medicine, School of Anti-Aging and Regenerative Medicine, Mae Fah Luang University, Bangkok, Thailand, e-mail: oob\_maya@yahoo.com

<sup>2</sup> Major Advisor Department of Anti-Aging and Regenerative Science, School of Anti-Aging and Regenerative Medicine, Mae Fah Luang University, Bangkok, Thailand.

<sup>3</sup> Co-advisor, Department of Anti-Aging and Regenerative Science, School of Anti-Aging and Regenerative Medicine, Mae Fah Luang University, Bangkok, Thailand, e-mail: yuiariya@gmail.com

### **Introduction**

Striae distensae is the common cutaneous problem that caused from continuous overstretching of the affected skin. Several related conditions leading to this cosmetic concern include growth spurt in period of puberty, pregnancy, obesity, some genetic disorders with abnormal collagen production (Marfan syndrome, Cushing syndrome), prolonged use of systemic and topical corticosteroid. The striae distensae can display in various characteristics with red, white, or brown hues in linear or retiform structures and can be found in multiple locations such as abdomen, buttock, chest wall.

The incidence of striae distensae showed that 25%-35% in adolescents and mostly 77% in pregnant women. Generally, the characteristics of striae begin with red color (striae rubra) progressively within linear streak, and then finally turn into white hue (striae alba) with atrophic and wrinkled skin. Currently, its pathophysiology is still not clearly understood, the cutaneous changes is similar to scar formation resulting in deterioration of collagen, elastic fibers, and ground substance.

There are many studied treatments of striae distensae namely application of trolastin, protection of striae by alpha-tretinoin or 0.1% tretinoin cream in postpartum care. Besides, some of

keratolytic agents such as 20% glycolic acid with 0.05% tretinoin or trichloroacetic acid for striae treatment was studied. Several laser-based devices (585-nm flash-pumped pulsed dye laser, Excimer laser, Diode laser, and 1064-nm Nd:YAG laser) have a significant role and good results in treatment of striae rubra; however, post-inflammatory hyperpigmentation (PIH) after treatment was still the concerning problems. The research about 1,550-nm Fraxel SL laser reveals significant increasing collagen and elastic fibers with certain adverse events of swelling, erythema and PIH. Nevertheless, there is no satisfied treatment with less side effects.

The principles of Intense pulsed light (IPL) describes the usage of non-coherent broad spectrum light source distributed over a general range of wavelength of 500-1,200 nm in with various cut-off filters which are commonly use to filter out the different lower frequencies. This technology is used to perform a variety of skin treatments with few side effects and can used with many clinical applications such as treatment of acne, PIH, wrinkles, telangiectasias, hair removal and facial rejuvenation.

With previous studies, wavelength of 645-1,200 nm can travel through the skin with 1.5-3.5 mm in depth. Without destruction of the epidermis, this light can stimulates collagen production in the dermal areas by thermal effect. Therefore, the researcher studied the efficacy of IPL in the treatment of striae distensae due to its convenience, popularity and safety.

## **Objectives**

To study the effectiveness of IPL for treatment of striae distensae in Thai people

## **Materials and methods**

### **Subjects**

20 Female volunteers diagnosed of striae alba with age of at least 20 years old were recruited. All participants were healthy with no history of underlying diseases, pregnancy, breastfeeding, smoking, photosensitivity, infection on treatment area, or any treatments of striae distensae within 6 months ago. Informed consent forms were acknowledged by all subjects.

### **Methodology**

15 female subjects completed the study. All participants' faces were spitted into left and right sides. IPL was randomly assigned on one side with the contralateral side as a control group without any procedure. Each subject took a photograph of the lesion and the striae were measured and evaluated the width before starting treatment. IPL treatments were performed on the treatment area every 2 weeks for 5 sessions (8 weeks). The patients were appointed to follow up for 4 weeks after last treatment for assessment of post-treatment striae width, photograph including satisfaction score. The immediate adverse events were always observed after treatment.

### **Statistics**

Demographic data were analyzed by descriptive statistics: numbers, percentages, standard deviation. Comparison of the photographic changes between before and after treatments were analyzed by statistical paired t-test. The striae width between IPL-treated side and control side were analyzed by non-parametric Mann Whitney-U test. Comparing the proportion of improved samples between two groups by 2 dermatologists was analyzed by Fisher Exact test. All statistics calculated by determination of confidence interval at 95%.

## **Results**

The analyzed results of comparison of the mean of striae width between IPL-treated group and control group disclosed that no significantly difference at baseline.

After IPL treatment, the mean of striae width statistically significantly decreased since the 3<sup>rd</sup> and 4<sup>th</sup> treatment ( $p < 0.05$ ). On the contrary, in the control group, the mean of striae width diminished with no significant difference.

Analyzing the comparing results of striae width between IPL-treated group and control group, significant difference of mean of striae width was not observed at 2<sup>nd</sup>-4<sup>th</sup> visits.

In terms of dermatologist assessment, the first doctor evaluated that 93.3% of participants have got improved in IPL-treated group, whereas control group was found improved only 6.7%. Such differences get reach statistically significant ( $p < 0.001$ ). Assessment of the other doctor revealed that 73.3% became improved in IPL-treated group, while 40.0% had got better in control group with no significant difference between two groups ( $p = 0.065$ ).

Most subjects estimated satisfaction score for IPL treatment to striae distensae in moderately satisfied level as 11 subjects (73.4%). The next one was very satisfied level as 3 patients (20.0%) and slightly satisfied level was evaluated by 1 patient (6.6%).

For the adverse effects, burning sensation had taken place in 1 case (6.6%) and 3 cases (20%) were scale occurring on the treatment area. However, standard treatments with ice packing including drug application were done in all cases and then resolved within 2-4 weeks.

### Conclusion

Intense pulsed light (IPL) can decrease in the width of striae alba superior to control in Thai people after 8 week and was well-tolerated. Although the treatment results are not as effective as the laser-based devices, IPL has lesser side effects, safe and inexpensive. However, combination with the other treatments may be considered.

### Discussion

Intense pulsed light (IPL) for treatment of striae alba in Thai people can significantly decrease striae width since 3<sup>rd</sup> -4<sup>th</sup> visit or 6-8 months after treatment ( $p < 0.05$ ). In control group, the diminishing of striae width was merely little observed and not reached the significant difference. From our study, the striae alba can be treated by IPL which can resulted in declination of striae alba width in Thai people after the 4<sup>th</sup> session (8 week).

After 12 weeks, dermatologist assessment of the first doctor showed statistically significant difference ( $p < 0.001$ ), but the other doctor was not ( $p = 0.065$ ). The researcher assumed that the different results may cause from individually subjective attitudes. Moreover, most patients had moderately satisfied to IPL treatment (73.4%).

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