The use of Alexandrite based diode for hair removal on Brazilian skin type

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Abstract

Background: The Soprano ICE platform offers a unique hair removal technique with different wavelengths of choice. The aim of this publication is to evaluate safety and efficacy of its alexandrite based 755nm diode laser module in hair removal of small areas in Brazilian skin type's patients.

Methods: 8 female subjects, all of Brazilian skin type III-V were treated for hair removal in small areas of the body in a 4 to 6 weeks intervals in a total of 4 sessions. Hair density was evaluated before and 6 months following 4th sessions and treatment area were photographed before and after.

Results: 6 months following 4 sessions of SHR In-Motion[TM] technique, hair count had presented a hair density decrease of 63% in total (42.25 Vs. 16.11), with an average fluence of 9.28J (range 7-12J) used and an average accumulation of 6.28kJ per area (range 5-10kJ). No adverse effects were reported by the patients within and between sessions.

Conclusion: the ALEX 755nm module of the Soprano ICE platform was proven safe and effective using the SHR In-Motion[TM] technique treating small body areas on Brazilian skin type II-V

Key words: Hair removal, Alexandrite diode, SHR, Brazilian skin type

Introduction

Laser hair removal has become popular for its long-lasting effect. It´s well known that there are various devices for hair removal, but Diode (810nm) and Alexandrite (755nm) technologies are considered the "gold standard" wavelengths for epilation. Recently, low fluence, high repetition rate and high average power diode laser emitting at 810nm wavelength was found to be safe and effective for all skin phototypes for the purpose of laser hair removal. However, the use of traditional Alexandrite 755nm laser technology in dark skin may pose clinical challenge due to its high peak power, significantly higher absorption in melanin when compared to the robust and advanced long pulse diode 810nm laser technology. This study was designed to clinically evaluate the safety and efficacy of a novel 755nm alexandrite laser device (Soprano Ice®, Alma Lasers Ltd) in Brazilian subjects with Fitzpatrick skin types II-V.

Technology

The Soprano ICE is a multi-platform system developed by *ALMA Lasers* for treatment of painless hair removal using the SHR method (Figure 1a). SHR differs from other techniques by emitting the laser in low fluence yet in high repetition rate (10Hz) to accumulate a total of high energy absorption into the hair structure. Being a multi-platform, the Soprano can be used with different diode modules of different wavelengths: 755nm (Alexandrite based), 810nm laser diode & 1064nm (Nd:YAG based). The diode that was selected was the Alexandrite based diode 755nm (Figure 1b) to evaluate the efficacy and safety in Brazilian skin type in small areas of the body. Diode is equipped with a sapphire tip cooling to maintain epidermis temperature low compared to the elevated dermis temperature and avoid adverse effects on the epidermis.

Method

After signing an informed consent, 8 female subjects of Brazilian skin type III-V were enrolled to this study. Prior to treatments all relevant medical history, skin type and hair type were evaluated. Exclusion criteria were patients <18 years of age, Pregnant or lactating, history of cancer, use of photosensitive medication, Epileptic or of hormonal disorders. Hair density was evaluated prior to first treatment in the intended treatment area and 6 months post 4th treatment in the same area (Underarm or bikini), and were photographed before and 6 months post treatment using Dermatoscope DermLite II Hybrid (3Gen Inc, USA). Prior to each session, patients were shave or had shaved the day before. Efficacy of the treatment was evaluated both by an evaluation of the hair count before and 6 months post 4th session and by comparing images taken at these timeframes. Safety was evaluated by patient's reports and physician evaluation.

Figure 1. Alma Soprano ICE hair removal platform (a) and Alexandrite wavelength (755nm) based ALEX module (b)

Treatment

Antiperspirants and perfumes were removed and area was covered with a reasonable amount of ultrasound gel (Carbomer, Triethanolamine and Preservative Water). Treatment parameters were decided upon skin and hair type suggested. Area was marked and then treated using the In-Motion^{TM} technique according to protocol, keeping the module in constant motion in the treatment area until accumulated energy was reached. Before each session treatment area was assessed and patients were asked regarding any adverse effect appearing following previous session.

Results

All 8 patients underwent 4 sessions at 4-8 weeks intervals and were documented, 3 had performed in underarm and 5 in bikini area. Data of patient's hair reduction and average settings are presented in Table 1 and visual hair reduction is presented in Table 1.

Patient #	Area	Hair Count			Average Fluence (J)	Average accumulation Energy (KJ)
		Before	3 months After	%Reduction		
1	Bikini	25	10	60	9.34	10
2	Underarm	38	15	60.53	8.63	5
3	Bikini	27	9	66.67	11.25	6
4	Underarm	62	16	74.19	9.88	6
5	Bikini	45	22	51.11	8	6
6	Bikini	24	7	70.83	8	6
7	Underarm	87	42	51.72	10	6
8	Bikini	30	7	76.67	10.44	5
Total	8	42.25	16	63.97	9.44	6.26

Table 1. Subject hair count, average fluence and energy used

Patients were documented for their hair density before treatment and compared to the density evaluated 6 months post 4th session (Figures 2&3). Results were calculated as % of reduction and average fluence and accumulative energy was calculated for each patient and in total. Significant hair reduction was achieved in the treated area by using a paired two-tailed T-test ($P< 0.00051$, $STD=19.52, 10.25$, Chart 1). Maximum hair reduction was as high as 76.67% and a total of 63.97% in average (Table 1).
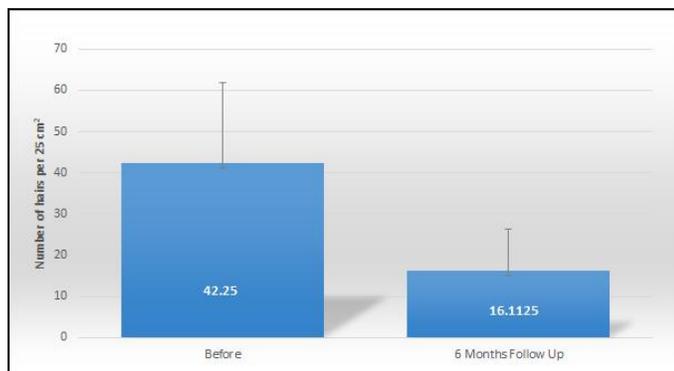

Chart 1. Average Hair count and Standard deviation of all patients before and 6 months post 4th treatment
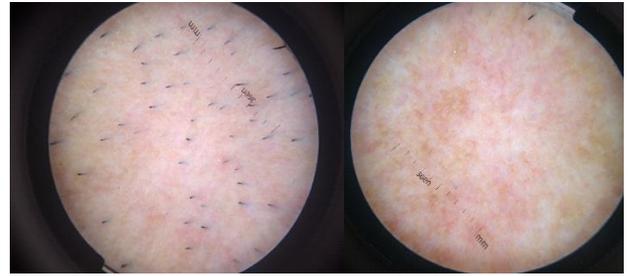

Figure 2. Before and 6 months after images of patient's #4 underarm

Patients had reported only minimal discomfort and mild heating sensation during treatments yet no long term adverse effects were noted by any of the participants nor by the treating physician.
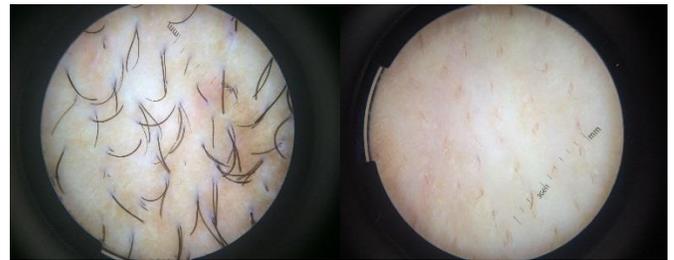

Figure 3. Before and 6 months after images of patient's #8 Bikini line

Summary

Significant hair reduction was observed in all patients following a regimen of 4 sessions using the Alexandrite based diode laser module in small areas of the body. A 6 months follow-up had proven that the technology in question is effective for the population of this study and was found safe to use as no adverse effects were noted.

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