Reduction of axillary hair of all colors after single treatment with microwave technology

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Background and Objectives: Techniques for the removal of unwanted hair are quite varied, with equally variable results. With the theory of selective photothermolysis, lasers have been designed to preferentially target hair follicles resulting in permanent removal. While this result has been more consistent with hair of darker pigment, treatment of lighter hair colors using these lasers has often proved futile. We evaluated a non-invasive focused microwave energy device in the removal of unwanted light and dark axillary hair.

Study Design and Methods: Single center, prospective study of individuals with unwanted axillary hair growth. Subjects meeting all inclusion and exclusion criteria were enrolled and treated with a non-invasive focused microwave energy device (miraDry System, Miramar Labs, Sunnyvale, CA). Standardized imaging was obtained at baseline or day of treatment and at thirty days after treatment. Subjects were directed to shave their axillary hair 5-7 days prior to treatment. Areas of involvement were templated and anesthetized with 1% lidocaine with 1:100,000 epinephrine, then conservatively treated utilizing the lowest energy settings. At thirty days after one treatment, hair reduction was calculated from hair counts in a 2cm x 2cm area in standardized photos.

Results and Conclusions: Six women and one man with an average age of 35.7 years (23-54 years), Fitzpatrick Skin Types I-III and unwanted axillary hair, were enrolled and treated. The majority of individuals had natural hair colors of brown (n=3), or light brown and/or blonde (n=3), with the remainder blonde/red (n=1). Immediately after treatment, subjects reported mild discomfort, edema, and bruising, with an average duration of six days. At thirty days post treatment, an average reduction of 43% in axillary hair was noted. While multiple treatments may be performed and longer follow up needed, one month after a single treatment with a non-invasive focused microwave energy device, an average reduction of 43% in axillary hair of all colors was achieved.
Background and Objectives

• In recent years, lasers have become the predominant method for hair reduction, and the third most common procedure performed by cosmetic dermatologists

• A variety of FDA cleared, commercially available laser systems exist for hair reduction

• Based on the theory of selective photothermolysis, the chromophore of the hair, melanin, absorbs the laser light energy and leads to hair reduction. In cases where there is not a marked difference in melanin concentration between the hair and the skin, laser hair reduction is ineffective and can possibly be dangerous

• An FDA-cleared non-invasive device used in this study utilizes microwave energy, focused at the dermal/hypodermal interface, to thermally impact the sweat glands. It was hypothesized that this heat would also affect the hair bulb, leading to hair loss. A feasibility study using an earlier generation of this device, with delivery of higher energy than used in this study, demonstrated loss of dark-colored hair after one treatment that ranged from 47-98%

• This study is designed to quantify the amount of hair reduction seen by patients treated with the non-invasive microwave system, while analyzing a subgroup of patients with light-colored axillary hair that is not easily treated by other commonly available treatments
Study Design and Methods

• Single center, prospective study of individuals with unwanted axillary hair growth

• Subjects meeting all inclusion and exclusion criteria were enrolled and treated with a non-invasive focused microwave energy device (miraDry System, Miramar Labs, Sunnyvale, CA)

• Standardized imaging was obtained at baseline or day of treatment and at thirty days after one treatment. Subjects were directed to shave their axillary hair 5-7 days prior to all photos

• Axillae were templated and anesthetized with 1% lidocaine with 1:100,000 epinephrine, then conservatively treated utilizing the lowest energy settings on the device. The recommended procedure for sweat reduction involves two treatments. This is planned for the subjects in this study however this report provides interim data

• At thirty days after one treatment, hair reduction was calculated from hair counts in a 2cm x 2cm area in standardized photos. Hair counts were completed by a single observer using image viewing software that provided zoom, pan and counting capabilities

<table>
<thead>
<tr>
<th>Demographics (n=7)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Average age (years)</td>
<td>36</td>
</tr>
<tr>
<td>Gender: % Female</td>
<td>6/7 = 86%</td>
</tr>
<tr>
<td>Skin Type:</td>
<td>I to III</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>100% Caucasian</td>
</tr>
<tr>
<td>Underarm hair: Light</td>
<td>n=4</td>
</tr>
<tr>
<td>Dark</td>
<td>n=3</td>
</tr>
</tbody>
</table>
Results and Conclusion

Results:
• The average reduction in axillary hair was 43% after one treatment for the 14 axilla measured. The range in results is quite large at this interim point in time (see the figure below)

• The average % reduction for light-colored axillary hair (blonde/light red/light brown) was 52%, and it was 31% for the darker hair (all brown)

• In general, patients experienced tenderness, swelling and some bruising post-treatment, but all resolved

![Graph showing % hair reduction per axilla after 1 treatment](image)

Conclusions:
• The device tested has shown the ability to reduce axillary hair, regardless of underarm hair color.

• The subjects will receive a second treatment and will be followed for a longer period of time to determine the stability of effect.

• Future directions include a study with large sample size and optimization of treatment parameters.

![Baseline - 42 hairs](image)

One month after 1 tx – 19 hairs: 55% reduction