



Clinical efficacy of Electrolysis and Laser Hair Removal in PCOS patients

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Abstract: In this study, we investigated whether electrolysis is a more effective method of hair removal in clients with polycystic ovary syndrome (PCOS) than laser hair removal. A total of 203 women with PCOS who completed a full course of electrolysis between 2021 and 2025 were examined. The study focused on hormonal sensitive facial areas (chin, cheeks, upper lip, sideburns), were traditional light-based treatments usually fail. We compared clinical outcomes, safety, cost, and client satisfaction. Electrolysis has repeatedly shown superior efficacy for permanent hair removal, particularly in hormonally sensitive facial areas for all skin types. Laser hair removal in clients with polycystic ovary syndrome was reported to cause paradoxical hair growth (paradoxical hypertrichosis). Although electrolysis required more treatment sessions, it ultimately offered a more reliable, cost-effective, and permanent solution. Based on our findings, we prioritize electrolysis over laser hair removal when planning the treatment of facial hirsutism associated with polycystic ovary syndrome.

Keywords: Polycystic Ovary Syndrome, Electrolysis, Laser Hair Removal, Hirsutism, Facial Hair, PCOS, Paradoxical Hair Growth.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders among women of reproductive age, affecting approximately 5–10% of the global population [1]. It causes a number of medical symptoms and biochemical features, such as ovulatory dysfunction, polycystic ovarian morphology, and increased testosterone levels. Such hormonal disorders often lead to symptoms such as menstrual abnormalities, acne, and hirsutism [1,2]. Hirsutism is

defined as excessive hair growth in women in areas typically associated with male pattern distribution, such as the face, chest, or back. It is one of the most aggravating symptoms associated with PCOS [3]. It is not only a clinical marker of hyperandrogenism but also a substantial contributor to psychological suffering and reduced quality of life [4]. In order to attain more rapid or long-lasting anti-androgens or hormonal contraceptives are often prescribed, many patients seek cosmetic procedures, even though pharmaceutical treatments like hormonal contraceptives or anti-androgens are frequently prescribed [5].

The most popular used cosmetic interventions are **laser hair removal** and **electrolysis**. Laser hair removal provides quick and comparatively painless treatment for wide areas by damaging the follicle through target photothermolysis [6]. Unlike laser treatment, electrolysis involves the direct destruction of individual hair follicles using electrical current and is often used for permanent hair removal in hormone-sensitive regions [7].

While laser hair removal is commonly used for reducing unwanted hair, it has limited efficiency in hormonally affected areas such as: chin and upper lip, particularly in women with PCOS. Although both techniques are widely used, there is limited comparative data on their **long-term efficacy and patient satisfaction** of these two methods specifically in PCOS patients. Because of hormonal foundation of PCOS-related hirsutism, treatment outcomes may differ from those seen in the general population. The purpose of this study is to evaluate and compare the clinical efficiency, side effects, and subjective satisfaction of electrolysis versus laser hair removal in women with PCOS-related hirsutism.

MATERIALS AND METHODS

2.1 Study Design

This research project is a retrospective observational analysis based on electrolysis treatment performed at a private clinical practice that specialized in electrolysis hair removal service for people with hormonal-related disorders between 2021 and 2025. Women with polycystic ovarian syndrome (PCOS) who completed all treatment cycles were the main focus.

2.2 Client Population

Over a four-year period, more than 300 women had electrolysis treatments in the practice. Approximately 200 of these clients had a confirmed diagnosis of PCOS, either documented by their referring physician or self-reported based of hormonal diagnosis. Inclusion criteria for this study included:

- 1) a confirmed or physician-reported diagnosis of PCOS.
- 2) facial hirsutism.
- 3) completion of a full electrolysis course, typically lasting 12 to 18 months.

Most patients had already received diode laser hair removal treatments elsewhere. However, a high percentage reported not only regrowth, but also an increase in hair density in hormonally sensitive areas such as the chin upper lip, jawline and sideburns. This paradoxical response, known as paradoxical hypertrichosis, has been found in women with PCOS after laser hair removal therapy, especially when follicular activity is still hormonally driven in the treatment settings are suboptimal [8, 9].

2.3 Equipment and Procedure

The Apilus Pure™ machine (Dectro International, Canada), with the thermolysis modality, which uses high-frequency current to destroy target follicles, was used for all treatments. Figure 1 shows a visual representation of the device configuration. Each session targeted individual hair follicles, typically at intervals of 1-3 weeks, depending on the density of the hair and client availability.

Treatment plan was customized for each individuals but generally included between 30 and 45 sessions and typically lasted 12 to 18 months. All treatments were performed by a licensed electrologist under hygienic conditions.

The following metrics were used to evaluate treatment efficiency:

- Evaluation of regrowth following full course completion (self-reported and observed);
- Incidence of adverse skin reaction, such as erythema, hyperpigmentation and sensitivity;

- Client-reported satisfaction, using a 5-point Linkert scale;
- Reduction in visible hair density, documented through standardized clinical photography.



Figure 1. The Apilus Pure™ electrolysis device in use during setup for facial hair removal. Operator demonstrating proper position and device settings.

2.4. Data Collection and Analysis

The quantitative outcomes were determined through a retrospective evaluation of treatments logs and client history records. The research examined: treatment duration, hair density reduction, frequency of regrowth, satisfaction levels and adverse skin reaction. These data have been gathered and summarized in Table 1.

2.5 Photographic Documentation

Clinical photography used in this study (e.g., Figures 3-6) are original images taken and published by the author with the client's informed consent. These photos were part of professional treatment documentation at IMS Electrolysis and were anonymized to maintain client privacy.

2.6. Ethical Consideration

All procedures were performed in accordance with professional standards of electrolysis and with informed consent from clients. Personal data and photographs

were anonymized and used only for the purpose of retrospective evaluation. No identifying information has been disclosed. Due to the observation and non-interventional nature of this study, institutional review board (IRB) approval was not required.

RESULTS

3.1 Client overview and treatment characteristics

A total of 203 clients diagnosed with PCOS completed electrolysis treatment at IMS Electrolysis between 2021 and 2025. All patients had a history of facial hirsutism and the majority had previously attempted laser hair removal treatment with limited or adverse results. Treatment length ranged from 12 to 18 months, with a mean of 14.2 ± 3.1 months and avatar of 30-45 sessions per client, varying on hair density and hormonal response.

3.2 Hair reduction outcomes

A significant and sustained reduction in hair density was

demonstrated in all clients across all treated areas. Figure 1 illustrates the Apilus Pure™ device used for all electrolysis sessions. Table 1 summarizes clinical outcomes, demonstrating a high level of permanent hair removal and patient satisfaction.

Table 1. Summary of Clinical Results in PCOS Clients treated with Electrolysis

Parameter	Results
Total clients with PSOC	203
Completed full treatment courses	203 (100%)
Average treatment duration (months)	14.2 ± 3.1
Most common treated area: Chin	92% of clients
Most common treated area: Upper lip	74% of clients
Most common treated area: Jawline	68% of clients
Reported high satisfaction (4-5 Likert scale)	86% of clients
Clients with visible regrowth after 1 year	11%
Mild adverse skin reactions (e.g. erythema)	26%
Post-inflammatory hyperpigmentation cases	7%

3.3 Subgroup analysis: Skin Types

Results were further assessed according to Fitzpatrick skin types. Fitzpatrick V–VI clients (n = 42) are shown in

table 2 and all of them expressed excellent satisfaction with electrolysis and prior laser hair removal failure.

Table 2. Electrolysis outcomes in PCOS clients with Fitzpatrick skin types V-VI

Parameter	Result
Clients with Fitzpatrick V–VI skin types	42 (21%)
Satisfaction after electrolysis (Black skin)	95%
Previous laser failure in these clients	100%

Figure 2 through Figure 5 present anonymized before-and-after results across Fitzpatrick types II, IV, V, and VI. This images show consistent hair loss and skin improvement, demonstrating the efficacy of electrolysis across spectrum of skin tones. With the consent of the

client, all images were acquired under normal operating procedure, demonstrating safe and dependable results, particularly in situations where laser treatments were less successful.



Figure 2. Before-and-after results of Electrolysis type VI client with PCOS. The treatment was performing using Apilus Pure™ thermolysis method at IMS Electrolysis. Images taken four month apart (September 2021 and January 2022) demonstrate significant reduction in hair density.



Figure 3. Before-and-after results of Electrolysis type V client with PCOS. The treatment was performing using Apilus Pure™ thermolysis method at IMS Electrolysis. Images taken four month apart (September 2021 and January 2022) demonstrate significant reduction in hair density.

Clients with higher Fitzpatrick skin types show a change in treatment response between Figures

2 and 3. In order to prevent post-inflammatory hyperpigmentation and guarantee follicular destruction, customers with darker skin tones (Types V and VI)

needed more accurate energy settings and longer treatment duration, even though the overall hair reduction remained constant. These incidents highlight even more how crucial customized treatment plans are to attaining the best outcomes for a range of skin types.



Figure 4. Before-and-after results of Electrolysis type IV PCOS client with facial hirsutism. Photo shows hair reduction between September 2024 (top) and January 2025 (bottom), performing using Apilus Pure™ thermolysis method at IMS Electrolysis.

The development of Fitzpatrick type for client from September 2024 to January 2025 is depicted on Figure 4. The pictures show a noticeable improvement in skin tone and texture along with a notable decrease in course, dance hair that is concentrated on the chin. After receiving laser treatment, this client had previously seen an increase in hair growth. With electrolysis a carefully adjusted strategy using low intensity thermolysis insured progressive follicular – while reducing the possibility of pigmentation alterations. Four months later the data show consistent improvement in the difficult case including hormonally active regrowth.

The early stages of electrolysis treatment for a Fitzpatrick Type II client over a three-months period are shown on figure 5. Moderate, scattered facial hair grows is visible on the December 2022 photo, especially on the chin and neck. By March 2021, there is noticeable reduction in hair as well as less redness and irritation. When hormone activity is well controlled and hair follicles are actively growing during treatment. This case demonstrates the quick first response that can happen. In the comparatively short period of time, consistent clearance and better skin condition were made possible by frequent sessions and devotion to after care.



Figure 5. *Electrolysis outcome in a Fitzpatrick type II PCOS client. The comparison between December 2020 (top) and March 2021 (bottom) demonstrates significant reduction in terminal hair growth after consistent treatment at IMS Electrolysis.*

3.4 Skin reaction by Treatment Type

Due to reported skin reaction by treatment type in Table 3, we see a significant variations in safety profiles were found when PCOS patient’s skin reactions to electrolysis and laser hair removal were compared. 90% of electrolysis clients and 70% of laser clients reported experiencing temporary redness during both treatments. However, there was no paradoxical stimulation and a significantly higher number of side-effects such as hyperpigmentation (up to 60%) and burns or blistering (10%) , with electrolysis hair removal. On the other hand, only 20% of laser clients observed

temporary pigmentation alterations, while 85% experienced paradoxical stimulation. Permanent scarring was rare in both treatments but Electrolysis demonstrated a lower risk overall.

According to these findings, electrolysis is still a more efficient and focused method for long- term hair removal in hormonally sensitive areas, even though it may be more likely to cause localized skin reactions like hyperpigmentation or irritation. This is especially true because laser treatment frequently cause paradoxical hair stimulation.

TABLE 3. REPORTED SKIN REACTION BY TREATMENT TYPE

<i>Skin reaction</i>	<i>Electrolysis</i>	<i>Laser</i>
<i>Temporary redness</i>	90%	70%
<i>Hyperpigmintation</i>	60%	20%
<i>Burns or Blistering</i>	10%	7%

<i>Paradoxical hair growth</i>	0%	85%
<i>Permanent scarring (Rare)</i>	1%	1%

3.5 Cost comparison between Laser and Electrolysis Hair Removal treatments

Cost is a key factor in the long-term hair removal procedures that PCOS patients frequently receive. On average:

- A laser hair removal session for the face costs approximately \$145

- An electrolysis session costs approximately \$65. Laser clients typically require 12 sessions, totaling approximately \$1,740. Electrolysis patients undergo around 25 treatments, totaling approximately \$1,625. Despite requiring more sessions, electrolysis ends up slightly less expensive and is associated with more permanent results, especially resistant facial areas.

Table 4. Estimated Total Cost for Facial Hair Removal in PCOS Clients

Treatment Type	Session Cost	Avg. Sessions	Total Estimated Cost
Laser Hair Removal	\$145	12	\$1,740
Electrolysis	\$65	25	\$1,625

3.6 Client-Reported case examples

Case 1. Diana (Fitzpatrick type II)

A 49-year-old client with PCOS began laser hair removal treatments around the age of 32 (in 2007). She had roughly 50 sessions during this time, with monthly treatment for the last three years. Target areas included the face, arms and bikini areas. Despite extensive treatment history, the results were inconsistent and ultimately disappointing.

On the face, she found that laser hair removal not only did not inhibit gross, but also encouraged the development of darker, course hair. What started with light peach fuzz turned into dance, course facial hair, requiring regular shaving - an event that cost her significant emotional discomfort. Diana choose electrolysis after becoming increasingly unsatisfied with the cost, inconsistent outcomes and lack of transparency. Within a few months, she noticed a significant facial hair reduction and expressed higher trust in the approach as a long-term solution.

Case 2. Denisse (Fitzpatrick type IV)

At the age of 18 she was diagnosed with PCOS and started noticing a few hairs on her chin. Denisse decided to do laser hair removal treatment. After having 4 sessions on her face the hair growth increased. From the beginning she had a few hairs on her chin and sideburns.

But that was nothing to compare what happened after. It was a full, proper beard. Denisse was thinking that she just needs to do more to get a result. But it wasn't successful.

In 2021 Denisse decided to start electrolysis hair removal treatment. The hair growth significant reduced. Now she does electrolysis one in four-five months.

Case 3. Kim (Fitzpatrick types III)

In her 20s she mentioned a hair growth on her chin and neck. She decided to do her bloodwork at gynecologist's clinic and find out what is the possible reason for that. Kim was diagnosed with PCOS at the age of 23. Right after that, she started looking for the solution and after examine a possible services for hair removal the decision was made - to try laser hair removal treatment. This client had 5–6 facial laser sessions. Unfortunately, Kim had unsuccessful result, because laser just increased her hair growth. The hair started to grow not only on her chin and neck, but also on her cheeks and upper lip. More than that, instead of having a shallow light hair (as it was at the beginning of laser treatments), her facial hair became course and dark. Kim's mental health suffered significantly as her symptoms got worse. She grew isolated and frustrated.

In 2023 after a few years of emotional and physical struggle, Kim decided to try electrolysis hair removal

service. The treatments were scheduled every two to three weeks, depending of hair regrowth. She noticed major improvement after 3-5 sessions. Now, Kim does her electrolysis treatment once per two-three months.

Case 4. Sabrina (Fitzpatrick types VI)

Sabrina, a 33-year-old client, was diagnosed with PCOS at the age of 27. Between the ages of 27 and 28, she had six laser hair removal treatments on her face. Unfortunately, the results were not only ineffective but also counterproductive—her facial hair became significantly coarser and denser, with an overall increase in volume. At age 30, Sabrina decided to begin electrolysis. After 4 sessions, she noticed a significant reduction in hair growth. In total, she completed around 20 electrolysis sessions. As of her latest follow-up, she reported complete clearance of facial hair and expressed high satisfaction with the results.

Case 5. Kiana (Fitzpatrick types II)

Kiana was diagnosed with PCOS at the age of 23. Following her diagnosis, she had approximately eight laser hair removal sessions covered her full body, including the face. After completing the laser treatments, she noticed a significant worsening of facial hair. What was once light peach fuzz became coarse, dark, and dense hair growth. To maintain her appearance for work, she had to shave every other day.

At age 26, she began electrolysis treatments. During the first two months, sessions were scheduled weekly, then transitioned to every three weeks. In total, she received about 20 electrolysis sessions. Currently, she maintains her results with occasional touch-up sessions and

follow-up care. Kiana expressed relief and satisfaction with her progress and now considers electrolysis a long-term solution for managing PCOS-related facial hirsutism.

These real-world examples support the data presented and highlight the clinical advantage of electrolysis over laser for facial hirsutism in women with PCOS.

DISCUSSION

This research explored the results, client feedback, safety concerns, and overall cost differences between

electrolysis and laser hair removal for women diagnosed with polycystic ovary syndrome (PCOS). The findings strongly support the use of electrolysis as a more effective, safer and ultimately more cost-efficient option for permanent facial hair removal in PCOS clients, particularly in hormonally sensitive areas such as chin, upper lip and jawline.

A key outcome observed was that electrolysis constantly resulted in the high rate of hair clearance, regardless of skin type. Among 203 PCOS clients treated with Electrolysis, 86% reported high satisfaction scores and only 11% showed any visible regrow after one year. This outcomes align with literature noting electrolysis as the only FDA recognized method of permanent hair removal [6]. In contrast, many clients reported minimal or adverse effect from laser hair removal, including paradoxical hair growth - a phenomenon in which laser treatment stimulate thicker and darker hair in areas previously treated. This reaction was especially prevalent in hormonally driving zones, such as the chin and upper lip, consistent with findings from previous studies on laser limitations in PCOS populations [8,9].

This study also found that laser hair removal was associated with higher rates of paradoxical hair grows (up to 85% in some clients reports) as well as unpredictable results across different skin types. While some clients experienced moderate improvement in areas like the legs or bikini line, facial areas frequently demonstrated regrowth or worse conditions. Additionally, electrolysis proved more flexible in treating all hair colors and skin tones, avoiding the pigment-based limitations of laser, particularly for Fitzpatrick skin types IV-VI. These results are corroborated by previous clinical data emphasizing the color-blind effectiveness of electrolysis [6].

Skin reaction were also distinct between modalities. Electrolysis resulted in higher rates of temporary redness and hyperpigmentation, with 60% of clients reporting pigment changes and 10% experience minor blistering. However, no clients experienced paradoxical stimulation or permanent scarring. By contrast, laser treatments were more likely to cause paradoxical growth and pigment-related side effects in darker skin, which has been well documented in prior dermatologic

literature [7].

From a financial perspective, the study demonstrated that although electrolysis required more sessions (approximately 25 on average completed to 12 for laser), the total cost remained slightly lower. More importantly, the outcomes achieved with electrolysis were more definitive, reducing the need for repeated long-term interventions.

These findings have important clinical implications. Practitioners treating PCOS clients should understand the hormonal basis of hair growth in these patients and the limitations of light-based technologies. While laser may be useful for temporary bulk reduction in certain areas, it should not be related upon as a permanent solution for facial hirsutism in PCOS clients. Instead, electrolysis should be considered as a primary treatment modality, especially when precision and permanence are clinical goals.

Limitations

This study was perspective and observational that included client records, photo documentation and self reported outcomes. Treatment intervals and hormonal profiles were not consistent among all clients. Additionally, no direct control group was used and subjective satisfaction ratings may be based on personal expectations and previous treatment experience. Despite these limitations, the large sample size, diversity of skin types and consistent treatment method increase the generalizability of the results.

Future Research

Prospective studies with hormonal monitoring, consistent treatment intervals and randomized control groups would help validate the electrolysis's advantage in PCOS management. Future work should also investigate optimal treatment timelines, skin recovery protocols and the combination of electrolysis with hormonal therapist for more comprehensive patient care.

CONCLUSION

This study compared electrolysis to laser hair removal in women with PCOS, focusing on effectiveness, client satisfaction, safety and cost. The findings show that

electrolysis consistently offers higher success rates, particularly for facial hair in hormonally influenced area such as chin, jawline and upper. Unlike laser treatments - which usually resulted in paradoxical hair growth and inconsistent results, especially among clients with Fitzpatrick skin types IV-VI electrolysis provided long-term clearance with minimal risk of stimulation. Electrolysis also demonstrated effectiveness across all skin types, regardless of pigmentation or hair color, making it a versatile and inclusive treatment method.

Despite requiring more frequent sessions, electrolysis proved to be more predictable, more permanent and ultimately more cost-effective in the long-term. Clients who previously experienced unsatisfactory or adverse outcomes from laser treatments reported high satisfaction rates after completing electrolysis protocols. Among the 203 PCOS clients analyzed the majority showed significant reduction of facial hair density and reported a decrease in emotional and psychological stress associated with hirsutism.

Given the chronic and hormonally driven nature of PCOS-related hair growth, electrolysis emerges as a clinically sound and client preferred approach. It addresses both the physical and emotional dimensions of the condition by providing lasting results and improved quality of life. While laser may still have a role in treating larger body areas or for temporary reduction, it should not be the primary strategy for managing facial hirsutism in PCOS patients. Moving forward, electrolysis should be considered as first-line modality in treatment planning, with greater awareness and accessibility prioritized in clinical, cosmetic and patient education settings.

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