



## Original Article

## Effect of Electro Optical Synergy System (ELOS) on Improving Quality of Life in Hirsutism

 Rabia Shaukat<sup>1</sup>, Rabia Mukhtar<sup>1</sup>, Bushra Bashir<sup>1</sup>, Rabia Tariq<sup>1</sup>, Atif Shehzad<sup>1</sup>, Lamees Mahmood Malik<sup>1</sup> and Tariq Rashid<sup>1</sup>
<sup>1</sup>Department of Dermatology Unit-1, Jinnah Hospital, Lahore, Pakistan

## ARTICLE INFO

## Key Words:

Hirsutism, Quality of Life, Electro-Optical Synergy System, ELOS

## How to Cite:

 Shaukat, R. ., Mukhtar, R. ., Bashir, B. ., Tariq, R. ., Shehzad, A. ., Malik, L. M. . & Rashid, T. . (2023). Effect of Electro Optical Synergy System (ELOS) on Improving Quality of Life in Hirsutism: Effect of ELOS on Improving Quality of Life in Hirsutism. Pakistan Journal of Health Sciences, 4(05). <https://doi.org/10.54393/pjhs.v4i05.543>

## \*Corresponding Author:

 Rabia Mukhtar  
 Department of Dermatology Unit-1, Jinnah Hospital,  
 Lahore, Pakistan  
[drrabiamahmad@gmail.com](mailto:drrabiamahmad@gmail.com)
Received Date: 2<sup>nd</sup> February, 2023Acceptance Date: 8<sup>th</sup> May, 2023Published Date: 31<sup>st</sup> May, 2023

## ABSTRACT

Hirsutism is a very common problem. Different treatment options are available to treat this condition. ELOS is one of the fast growing treatment modality leading to improvement in quality of life of hirsute women. **Objective:** To assess mean decrease in dermatology life quality index (DLQI) in hirsute women treated with electro optical synergy system (ELOS). **Methods:** This study was conducted involving 100 women aged between 16-60 years presenting with hirsutism having DLQI score of >10 at presentation. These women underwent treatment with electro optical synergy system (ELOS); 3 sessions 4 weeks apart. DLQI score was assessed again 4 weeks after 3<sup>rd</sup> session. **Results:** The mean age of women in this study was 24.8±7.9 years. Majority (n=73, 73.0%) of these women was unmarried. The mean duration of disease was 5.2±2.2 years. The mean DLQI score was 18.46±4.72 at baseline which decreased to 11.96±5.28 after treatment with ELOS. The mean decrease in DLQI score was 6.50±1.81. **Conclusions:** In the present study it was seen that in women presenting with hirsutism, electro-optical synergy system (ELOS) treatment resulted in improved quality of life evident from a statistically significant decrease in DLQI score.

## INTRODUCTION

Hirsutism is defined as an excessive growth of terminal hair in a male pattern in females. Around 5 to 10% of reproductive-age women are affected by hirsutism. It is one of the common presenting complaints to dermatologists and other healthcare professionals. It occurs as a result of an excessive production of androgens from ovaries or adrenal glands [1]. Hirsutism causes cosmetic disfigurement and it causes adverse effects on social and psychological aspects of females. It also leads to embarrassment, depression, anxiety, and social withdrawal which in turn leads to decrease in quality of life. It also gives clue to many underlying diseases including metabolic syndrome and polycystic ovarian disease [2].

There are various techniques such as shaving, waxing, and epilation to solve this problem but these provide only a temporary solution [3]. It is important to provide effective long term removal of these unwanted hair in order to prevent negative psychological sequela [4]. Laser and light-based technology have become fastest growing procedures for hair removal in cosmetic dermatology during last decade [3]. There has been a continued evolution of electro-optical synergy system leading to improvement in the long-term efficacy of laser and intense pulsed light (IPL) source for hair removal [5]. These technologies range from shorter wavelength ruby (694nm) to mid-spectrum 755nm Alexandrite and 800-810nm Diode

to 1 Nd:YAG lasers (1064 nm). Intense pulsed light (IPL) with 590-1200 nm wavelength is also used for removal of hair [4]. The electro-optical synergy system delivers a relatively low level of optical energy which is safe for different skin types while utilization of an additive energy of radiofrequency (RF) compensates for lack of high laser light intensity. Radiofrequency is not an optical and melanin is not required as a target chromophore, but hair structure absorbs it selectively [5]. A study conducted by Wong et al., showed that laser and electro-optical synergy technology caused significant improvement in quality of life in hirsutism [6]. Another study conducted in Iran showed significant reduction in mean DLQI score. The DLQI score before treatment was  $9.42 \pm 5.99$ , which was reduced to  $3.12 \pm 3.40$  after laser treatment [7]. The aim of this study was to evaluate the effect of hair reduction by electro-optical synergy system on improving quality of life of hirsute women. Various studies are conducted worldwide to assess the improvement in quality of life in hirsutism by ELOS and lasers but very little local data were available.

## METHODS

This was a quasi-experimental study. It was conducted at Dermatology Unit-I, Jinnah Hospital Lahore over a period of 6 months (08/10/2020 to 07/04/2021). A total of 100 patients were selected by non-probability, consecutive sampling technique. Female patients ranging from 16 to 60 years having hirsutism with DLQI >10 were included in study. Pregnant females, patients having photosensitivity and any psychiatric illness like depression, schizophrenia and mania were excluded. Informed consent was taken and basic demographic data along with relevant clinical data were recorded in a structured predesigned proforma. Data were collected in two phases; before first session of ELOS and 4 weeks after third session. The interval between each session was 4 weeks. All patients were asked to complete a valid translated urdu version of dermatology life quality index questionnaire before first session of ELOS and 4 weeks after third session. Each patient scored 0-3 for 10 items in the questionnaire. All the collected data were entered and analyzed through SPSS version 21.0. Numerical variables were presented by Mean  $\pm$  SD. Paired sample t-test was used to compare pre and post treatment DLQI scores taking p-value of  $\leq 0.05$  as statistically significant.

## RESULTS

The ages of the patients were ranging from 16 years to 60 years with a mean of  $24.8 \pm 7.9$  years. 80.0% of the women were younger than 30 years (Table 1). 33.0% women were illiterate while 26% were educated up to primary level, 19% up to middle level whereas 22% were above matric level. Socioeconomic status of these women was shown in Table

1. 73% of these women was unmarried while 27% was married. The duration of disease was in a range of 1 to 9 years with a mean value of  $5.2 \pm 2.2$  years. The most frequently involved area was chin (30.0%) followed by upper lips (26.0%), sideburns (17.0%), cheeks (14.0%) and neck (13.0%) as shown in Table 1.

**Table 1:** Baseline Characteristics of Study Sample

Characteristics	Participants n=100
Age (years)	24.8 $\pm$ 7.9
<30 years	80 (80.0%)
$\geq$ 30 years	20 (20.0%)
Duration of Disease (years)	5.2 $\pm$ 2.2
<5 years	51 (51.0%)
$\geq$ 5 years	49 (49.0%)
Area Involved	
Upper Lips	26 (26.0%)
Sideburns	17 (17.0%)
Cheeks	14 (14.0%)
Chin	30 (30.0%)
Neck	13 (13.0%)
Educational Status	
Illiterate	33 (33.0%)
Primary	26 (26.0%)
Middle	19 (19.0%)
Matric and above	22 (22.0%)
Socioeconomic Status	
Lower Class	38 (38.0%)
Middle Class	27 (27.0%)
Upper Class	35 (35.0%)
Marital Status	
Unmarried	73 (73.0%)
Married	27 (27.0%)

At baseline the DLQI score was ranging from 11 to 27 at baseline with a mean of  $18.46 \pm 4.72$  and after 3 sessions of ELOS done 04 weeks apart it was from 2 to 22 with a mean of  $11.96 \pm 5.28$  at follow-up. The decrease in DLQI was shown in Table 2 and 3.

**Table 2:** Description of DLQI Score among Hirsutism Patients receiving ELOS at various Time Stamps, n=100

Time Stamp	Dermatology Life Quality Index Score (mean $\pm$ SD)	p-value
Baseline	18.46 $\pm$ 4.72	<0.001*
After Treatment	11.96 $\pm$ 5.28	
Mean Decrease	6.50 $\pm$ 1.81	

Paired sample t-test comparing baseline and follow-up mean DLQI score, \*observed difference was statistically significant

**Table 3:** Comparison of Baseline and Follow-up Mean DLQI Scores across various Subgroups,  $n=100$ 

Subgroups	DLQI Score (mean $\pm$ SD)		p-value
	At Baseline	At Follow-up	
<b>Age</b>			
<30 years	18.49 $\pm$ 4.96	11.98 $\pm$ 5.46	<0.001*
$\geq$ 30 years	18.35 $\pm$ 3.73	11.90 $\pm$ 4.63	<0.001*
<b>Duration of Disease</b>			
<5 years	18.49 $\pm$ 4.12	11.94 $\pm$ 4.86	<0.001*
$\geq$ 5 years	18.43 $\pm$ 5.32	11.98 $\pm$ 5.74	<0.001*
<b>Area Involved</b>			
Upper Lips	18.46 $\pm$ 4.79	12.15 $\pm$ 5.52	<0.001*
Sideburns	18.88 $\pm$ 4.73	11.94 $\pm$ 4.94	<0.001*
Cheeks	19.21 $\pm$ 4.30	12.57 $\pm$ 4.07	<0.001*
Chin	18.00 $\pm$ 4.91	11.43 $\pm$ 5.84	<0.001*
Neck	18.15 $\pm$ 5.18	12.15 $\pm$ 5.70	<0.001*
<b>Educational Status</b>			
Illiterate	17.55 $\pm$ 4.65	11.18 $\pm$ 5.31	<0.001*
Primary	19.96 $\pm$ 4.37	13.38 $\pm$ 4.94	<0.001*
Middle	17.53 $\pm$ 5.25	11.16 $\pm$ 5.91	<0.001*
Matric and above	18.86 $\pm$ 4.56	12.14 $\pm$ 5.05	<0.001*
<b>Educational Status</b>			
Lower Class	18.13 $\pm$ 4.90	11.66 $\pm$ 5.40	<0.001*
Middle Class	18.96 $\pm$ 4.68	12.41 $\pm$ 4.92	<0.001*
Upper Class	18.43 $\pm$ 4.67	11.94 $\pm$ 5.54	<0.001*
<b>Marital Status</b>			
Unmarried	18.51 $\pm$ 4.73	12.01 $\pm$ 5.13	<0.001*
Married	18.33 $\pm$ 4.80	11.81 $\pm$ 5.78	<0.001*

Paired sample t-test comparing baseline and follow-up mean DLQI score, \*observed difference was statistically significant

There was no statistically significant difference in mean decrease in DLQI score across various subgroups of the patient as shown in Table 4.

**Table 4:** Comparison of Mean Decrease in DLQI Score across Various Subgroups,  $n=100$ 

Subgroups	N	Decrease in DLQI Score (mean $\pm$ SD)	p-value
<b>Age</b>			
<30 years	80	6.51 $\pm$ 1.77	0.891
$\geq$ 30 years	20	6.45 $\pm$ 2.01	
<b>Duration of Disease</b>			
<5 years	51	6.55 $\pm$ 1.80	0.784
$\geq$ 5 years	49	6.45 $\pm$ 1.84	
<b>Area Involved</b>			
Face	57	6.58 $\pm$ 1.78	0.618
Chin + Neck	43	6.40 $\pm$ 1.87	
<b>Educational Status</b>			
Illiterate + Primary	59	6.46 $\pm$ 1.88	0.781
Middle and above	41	6.56 $\pm$ 1.73	
<b>Socioeconomic Status</b>			
Lower and Middle Class	65	6.51 $\pm$ 1.74	0.954
Upper Class	35	6.49 $\pm$ 1.96	

Subgroups	N	Decrease in DLQI Score (mean $\pm$ SD)	p-value
<b>Marital Status</b>			
Unmarried	73	6.49 $\pm$ 1.68	0.951
Married	27	6.52 $\pm$ 2.17	

Independent sample t-test comparing mean decrease in DLQI score observed difference was statistically insignificant

## DISCUSSION

Quality of life (QoL) is defined as capacity to perform the daily activities which is in accordance with person's age and his or her role in life [7, 8]. This role can be in form of paid employment, schooling, household work or taking care of oneself. Different indices are available including questionnaires which measure the extent of disability due to skin diseases [8]. Dermatology life quality index (DLQI) is a routinely used tool which assesses the quality of life in dermatological patients [7-9]. Hirsutism is commonly encountered medical complaints of women of reproductive age [6, 10]. It negatively impacts upon the quality of life leading to stress, anxiety and depression especially in cultures where hairlessness is regarded as one of the norms for women [7, 11]. Electro-optical synergy (ELOS) is a unique combination of optical and electrical radiofrequency (RF) energies which are applied to tissue at the same time. It has been used to treat hirsutism effectively in various skin types [6, 7]. A recent study claimed that electro optical synergy system (ELOS) treatment causes significant improvement in the quality of life of women with hirsutism and also recommended it in future practice owing to its simplicity and safety [7]. The existing evidence was however limited which necessitated the present study. In this study, the mean age of the women with hirsutism was 24.8 $\pm$ 7.9 years. This observation was also made by another local study conducted by Anjum et al., who reported mean age of 24.6 $\pm$ 6.5 years [12]. Kutlu also reported mean age of 24.1 $\pm$ 4.2 years [13]. Other local studies also reported similar mean age [14, 15]. A comparable mean age of 24.4 $\pm$ 6.2 years and 24.2 $\pm$ 5.6 years had been reported by Kiran et al., and Chhabra et al., respectively among Indian patients [16, 17]. In our study, we observed that majority (73.0%) of women with hirsutism was unmarried. This observation was also made by Malik et al., who observed that the proportion of unmarried women was 71.0% and Shaffique et al., reported it to be 74.0% [15, 18]. A frequency of 83.0% had been observed by Ahmad et al., in Indian occupied Kashmir [19]. The mean duration of disease at the time of presentation was 5.2 $\pm$ 2.2 years in present study. Chhabra et al., reported the mean duration of disease at the time of presentation was 6.1 $\pm$ 3.4 years [17]. A comparable mean duration of disease was also reported by Rahnama et al., in Iranian women who found it

to be  $8.9 \pm 5.9$  years [20]. In the present study, the mean DLQI score was  $18.46 \pm 4.72$  at baseline which decreased to  $11.96 \pm 5.28$  after ELOS. This change in DLQI score was statistically significant ( $p$ -value  $< 0.001$ ). The mean decrease in DLQI score was  $6.50 \pm 1.81$ . This observation was also made by another local study where Baig et al., studied quality of life in 200 hirsute women at Mayo Hospital, Lahore. They reported a mean DLQI score of  $17.9 \pm 5.8$  causing great impact on quality of life of patients with hirsutism [8]. In a similar experimental study conducted on Iranian women with hirsutism, Maziar et al., also reported a significant decrease in mean DLQI score with ELOS treatment from  $9.42 \pm 5.99$  to  $3.12 \pm 3.40$  with a mean reduction of  $6.30 \pm 2.59$  [7]. When we stratified our results on the basis of age, duration, site of disease, educational status, socioeconomic status and marital status, no statistically significant difference in mean decrease in DLQI score was noted. The strengths of this study was a large sample size including 100 cases. We followed exclusion criteria strictly and the result was stratified to address different effect modifiers. Limitation of our study was that we did not follow the patients to see recurrence of disease and its role in DLQI score was not evaluated. It is highly recommended to do such studies in future for clinical research. This study is an addition to the limited published international research evidence on the topic. Electro optical synergy system (ELOS) treatment resulted in improved quality of life in hirsute women in this study as evident from a considerable decrease in DLQI score which advocates the preferred use of ELOS in the treatment of such women presenting in future dermatological practice.

## CONCLUSIONS

We concluded that electro-optical synergy system (ELOS) treatment resulted in improved quality of life evident from a considerable decrease in DLQI score in women presenting with hirsutism.

## Authors Contribution

Conceptualization: TR

Methodology: RS, RM

Formal Analysis: BB, RT

Writing-review and editing: BB, AS, LMM, TR

All authors have read and agreed to the published version of the manuscript.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

## REFERENCES

- [1] Mihailidis J, Dermesropian R, Taxel P, Luthra P, Grant-Kels JM. Endocrine evaluation of hirsutism. *International Journal of Women's Dermatology*. 2017 Mar; 3(1): S6-10. doi: 10.1016/j.ijwd.2017.02.007.
- [2] Agrawal KH, Belgaumkar VA, Chavan RB, Deshmukh NS. Impact of Hirsutism on the Quality of Life: A Cross-Sectional Pilot Study from Dermatology Life Quality Index Western India. *Journal of Skin and Stem Cell*. 2022 Jun; 9(2): e123857. doi: 10.5812/jssc-123857.
- [3] Bhat YJ, Bashir S, Nabi N, Hassan I. Laser treatment in hirsutism: an update. *Dermatology Practical & Conceptual*. 2020 Apr; 10(2): e2020048. doi: 10.5826/dpc.1002a48. doi: 10.5826/dpc.1002a48.
- [4] Krasniqi A, McClurg DP, Gillespie KJ, Rajpara S. Efficacy of lasers and light sources in long-term hair reduction: a systematic review. *Journal of Cosmetic and Laser Therapy*. 2022 Jul; 24(1-5): 1-8. doi: 10.1080/14764172.2022.2075899.
- [5] Sadick NS and Laughlin SA. Effective epilation of white and blond hair using combined radiofrequency and optical energy. *Journal of Cosmetic and Laser Therapy*. 2004 May; 6(1): 27-31. doi: 10.1080/14764170410029022.
- [6] Wong SC and Rivers JK. Does Laser and/or Electro-optical Synergy Technology for Removal of Unwanted Facial Hair Improve Women's Quality of Life? *Journal of the Dermatology Nurses' Association*. 2009 Nov; 1(6): 338-43. doi: 10.1097/JDN.0b013e3181c4eb82.
- [7] Maziar A, Farsi N, Mandegarfar M, Babakoohi S, Gorouhi F, Dowlati Y, et al. Unwanted facial hair removal with laser treatment improves quality of life of patients. *Journal of Cosmetic and Laser Therapy*. 2010 Jan; 12(1): 7-9. doi: 10.3109/14764170903449802.
- [8] Baig T, Aman S, Nadeem M, Kazmi AH. Quality of life in patients of hirsutism. *Journal of Pakistan Association of Dermatologists*. 2016 Dec; 24(3): 217-23.
- [9] Sanchon R, Gambineri A, Alpanes M, Martínez-García MÁ, Pasquali R, Escobar-Morreale HF. Prevalence of functional disorders of androgen excess in unselected premenopausal women: a study in blood donors. *Human Reproduction*. 2012 Apr; 27(4): 1209-16. doi: 10.1093/humrep/des028.
- [10] Sachdeva S. Hirsutism: evaluation and treatment. *Indian Journal of Dermatology*. 2010 Jan; 55(1): 3. doi: 10.4103/0019-5154.60342.
- [11] Gaber MA and El-Sayed SA. Quality of life in patients having hirsutism. *Menoufia Medical Journal*. 2021 Apr; 34(2): 477. doi: 10.4103/mmj.mmj\_328\_19.
- [12] Anjum S, Askari S, Riaz M, Basit A. Clinical

- Presentation and Frequency of Metabolic Syndrome in Women with Polycystic Ovary Syndrome: An Experience from a Tertiary Care Hospital in Pakistan. *Cureus*. 2020 Dec; 12(12): e11860. doi: 10.7759/cureus.11860.
- [13] Kutlu Ö. Evaluation of quality of life of patients with hirsutism among Turkish women: A single-center cross-sectional study. *Journal of Cosmetic Dermatology*. 2020 Nov; 19(11): 3053-7. doi: 10.1111/jocd.13563.
- [14] Farid-ur-Rehman, Sohail I, Hayat Z, Niazi NA. Etiology of hirsutism. Is there a correlation between menstrual regularity, body mass index and severity of hirsutism with the cause? *Journal of Pakistan Association of Dermatologists*. 2016 Dec; 20(1): 49.
- [15] Malik LM, Khursheed K, Haroon TS, Malik MA. An aetiological study of moderate to severe hirsutism. *Pakistan Journal of Medical Sciences*. 2007 Apr; 23(2): 167.
- [16] Kiran KC, Gupta A, Gupta M. The effect of hirsutism on the quality of life of Indian women. *International Journal of Research in Dermatology*. 2018 Mar; 4(1): 62-5. doi: 10.18203/issn.2455-4529.IntJResDermatol20180142.
- [17] Chhabra S, Gautam RK, Kulshreshtha B, Prasad A, Sharma N. Hirsutism: A clinico-investigative study. *International Journal of Trichology*. 2012 Oct; 4(4): 246. doi:10.4103/0974-7753.111204.
- [18] Shaffique S, Ahmad S, Asif HM, Anwar H, Hussain G, Javed S. Prevalence of Hirsutism in The Islamia University Bahawalpur, Pakistan. *RADS Journal of Pharmacy and Pharmaceutical Sciences*. 2018 Apr; 6(1): 17-21.
- [19] Ahmad QM, Shah IH, Sameem F, Sultan J. Hirsutism in Kashmir: an etiological study. *Indian Journal of Dermatology*. 2009 Jan; 54(1): 80. doi: 10.4103/0019-5154.48997.
- [20] Rahnema Z, Sohbaty S, Safizadeh H. Effect of hirsutism on quality of life: a study in Iranian women. *Journal of Pakistan Association of Dermatologists*. 2016 Dec; 23(1): 28-33.