

The Effect on Telangiectasias of the Nose with a Novel Intense Pulsed Light Source as Evaluated with Randomly Selected Half-side Treatment

Pyra Haglund, MD, PhD, Stureplanskliniken, Lastmakargatan 18, S-111 44 Stockholm, Sweden

Summary Different lasers and intense pulsed light (IPL) sources have been used over the last years to achieve reduction of facial telangiectasias. Multiple studies have shown IPL to be effective using subjective assessment of results, and one study has also shown long-term effects as judged by photos and patient self-assessment.. For the purpose of getting an objective evaluation of the effect of IPL on telangiectasias, this single-blind study was undertaken where one half of the nose was randomly chosen for treatment and the other half served as control. With a protocol of three treatments one week apart and evaluation one week after the last treatment, a diminishing effect of IPL on telangiectasias was clearly demonstrated. For this study, a novel IPL light source, the Powerlite 600 EP, was used.

Acknowledgement

I would like to thank Dr Anna Josephson, MD, PhD, Dept of Neurosurgery, Karolinska University Hospital, Solna, and Dr Ralf Sundberg, MD, PhD, Laser Clinic Group Sundberg and Agdell, Malmö, for help with evaluation of results and for valuable discussion after evaluation. I would also like to thank Bo Nilsson, PhD, Dept of Medical Statistics, Radiumhemmet, Karolinska University Hospital, Solna, for advice and guidelines in planning the study, and Dr Marie Wickman, MD, PhD, Dept of Plastic Surgery, Karolinska University Hospital, Solna, for valuable advice.

This study was approved by the Scientific Ethics Committee North at Karolinska University Hospital, Solna.

Background

Facial telangiectasias, defined as superficial cutaneous vessels of 0,1-1 mm diameter, are common and often seen on the ala nasi and along the upper part of the nasolabial folds. Telangiectasias are thought to occur through the release of vasoactive substances. These can be triggered by hormones, infections, chemical and physical factors and are thought to be an important factor in the rosacea disease. Telangiectasias may also occur due to a weakness in the vessel wall and surrounding tissue and hereditary factors as well as chronic sun exposure and alcohol consumption are of importance. (1).

A variety of lasers have been used to diminish the number of facial telangiectasias (2-10). Recently, intense pulsed light has been shown to have an effect on telangiectasias (11-15) and it has also been demonstrated in microscopic examination of skin biopsies (16). The results of IPL treatment have recently been shown to be long-term (17).

Intense pulsed light emits light of a variety of wave lengths usually between 540 and 900 nm. IPL treatment is based on the concept of selective photothermolysis with absorption of light in the target chromophore and very little absorption in surrounding tissue. Light energy is transformed into heat energy with proteolysis and destruction of target tissue. The target chromophore when treating telangiectasias is oxyhemoglobin with absorption peaks at 542 and 577 nm. Oxyhemoglobin also has an absorption peak at 418 nm but this wavelength is also absorbed by the melanin chromophore and is therefore less suited for selective treatment of blood vessels.

All treatments were performed at Stureplanskliniken by dr Pyra Haglund, who has a vast experience of IPL treatment over the last seven years using several different IPL sources for

skin rejuvenation, hair removal, hyperpigmentation, various vascular lesions such as spider veins, reticular veins, telangiectasias, rosacea, various hemangiomas and port wine stain.

Materials and Methods

For the study, four male and three female patients of skin types II and III were selected. They were all selected because they had some degree of telangiectasias of the nose. The telangiectasias were of the same degree on the left and right halves of the nose. After consulting an expert on medical statistics, a number of seven patients was chosen. Exclusion criteria were pregnancy, breast-feeding, photo sensitive medication, Roacutane treatment for the last year prior to the study, immuno deficiency, liver disease and pronounced tan. Patients with a history of basalioma, skin epithelial cancer, malignant melanoma or dysplastic nevus syndrome were also excluded.

The intense pulsed light source that was used was a Powerlite 600 EP from Preswede AB with a small yellow treatment head. It emits wavelengths of 540-950 nm in a pulse design of 2 ms pulse, 2ms delay and so on and where settings of 30-80 ms were used, i.e. 7-20 pulses in each treatment corresponding to energy levels of 15-25 J/cm².

Immediately before the first treatment, digital photos of patients in frontal and side position were taken. Whether treatment was to be on the right or left side of the face was decided by throwing a dice.

A cooling gel 1-2 mm thick was applied and one treatment passage was performed on the chosen half of the nose. Treatment was slightly painful. After treatment, an aloe vera gel was applied for soothing.

Treatment of the chosen half of the nose was repeated after one and two weeks and after three weeks digital photos were taken in the same positions as before treatment. Patients were then offered immediate treatment of the other side free of cost.

Evaluation of the treatment results was done from the photos in the computer by two physicians who had not been involved in the treatment and who did not know which side was treated. Evaluation was also done by the patients themselves and they were given the opportunity to study the photos before evaluating.

Results on the telangiectasias were graded in "worse", "unchanged", "slight improvement" and "great improvement".

Results

Of the seven patients treated, five found a great improvement and two found a slight improvement on the treated side. In six of seven patients, no effect was seen on the untreated side.

The double-blind evaluation was done by two different doctors from evaluation of photos only, but they were allowed to magnify photos for evaluation. Both doctors could detect an effect for the better on the treated side rather than the untreated side in six of seven patients.

A slight erythema and some residual heat were sometimes present the first day after treatment. The treatment was somewhat painful but anesthesia was not needed. The effect on telangiectasias was often immediate where the vessels would become invisible immediately after treatment. No other side effects were seen.

Table 1. Evaluation of results on treated vs untreated side as evaluated by the patients themselves and by two doctors. Results on the telangiectasias were graded in "worse", "unchanged", "slight improvement" and "great improvement" (-, 0, + and ++ in table).

Patient	Self		Dr 1		Dr 2	
	Treated	Untreated	Treated	Untreated	Treated	Untreated
1=A	++	0	++	0	++	0
2=G	++	+	+	0	0	0
3=J	++	0	++	0	++	+
4=K	+	0	+	0	++	+
5=N	++	0	++	0	+	0
6=P	++	0	0	+	++	0
7=V	+	0	++	0	0	-

Figure 1.
Before treatment to the left, after treatment to the right.







Discussion The IPL treatment was very effective in treating telangiectasias of the nose; all of the patients found improvement or great improvement on the treated side and one of them found not only great improvement of the treated side but also improvement of the untreated side. As for the patients self assessment of the effect it was clear that the treatment had effect in all cases and also that the effect was seen mostly in the treated side.

The double-blind evaluation was done by two different doctors from evaluation of photos only, but they were allowed to magnify photos for evaluation. Doctor no 1 found great or slight improvement on the treated side and no effect on the untreated side in six of seven cases and an improvement on an untreated side with no effect on the treated side in one case. Doctor no 2 found great or slight improvement on the treated side in five of seven cases. Interestingly, doctor no 2 found a worse status on an untreated side after treatment as compared with an unchanged status on the treated side; however this doctor made the spontaneous comment that this patient has a general redness with telangiectasias in the whole face and that the general level of redness was more pronounced in the after pictures. Hence, there was a degree of improvement on the treated side when considering the general flushing status of the face at the time of evaluation. In the seventh case, there were very few telangiectasias and doctor no 2 could not see a definite change after treatment.

One patient noted a slight improvement on the untreated side with a great improvement on the treated side, the same pattern was noted by doctor no 2 in two cases. A possible explanation for this is that telangiectasias of the face are interconnected and when telangiectasias in one area are closed due to the IPL treatment it may well decrease the blood flow of telangiectasias in surrounding areas, e.g. the other side of the nose.

The single-blind evaluation was done from photos only. For future studies it would be interesting to make a clinical evaluation of the patients also, since live evaluation can always be more detailed and probably would lead to more safe assessments of clinical effect. It is also important to choose evaluators with care. Doctor no 2 is doing IPL treatments since many years and thus experienced in evaluating treatment results whereas doctor no 1 is not. Also, if the evaluators were to evaluate many more photos, their evaluations would probably be even more consistent and correct.

Clinically, the treatment results with this machine are very similar to the results obtained with other IPL machines used by the author over the years. Technically, it can be noted that the number of pulses is even higher with the Powerlite but the total energy level is similar or a little lower than the settings usually used with e.g. Lumenis machines. This seems to have a clinical significance since the amount of residual heat and erythema after treatment was less pronounced after successful telangiectasia treatment (immediate visible clearing of vessels) with the Powerlite than after successful treatment with other machines. A pulse design with more pulses, increasing the accumulated heat in the target chromophore even more while allowing for epidermal thermal relaxation may be the answer to more effective treatments with lower total energy fluencies and thus less side effects.

In summary, the Powerlite 600 provides an efficient treatment of telangiectasias of the nose as shown by half-sided treatment and single-blind evaluation with even less side effects such as erythema and residual heat than other IPL machines.

References

1. Goldman MP, Bennett RG. Treatment of telangiectasia: a review. *J Am Acad Dermatol* 1987;17:167-82.
2. Ross M, Watcher MA, Goodman MM. Comparison of the flashlamp pulsed dye laser with the argon tunable dye laser with robotized handpiece for facial telangiectasias. *Lasers Surg Med* 1993;13:374-8.
3. West TB, Alster TS. Comparison of the long-pulsed dye (590-595 nm) and KTP (532 nm) lasers in the treatment of facial and leg telangiectasias. *Dermatol Surg* 1008;24:222-6.
4. Goldberg DJ, Meine JG. A comparison of four frequency-doubled Nd:YAG (532 nm) laser systems for treatment of facial telangiectases. *Dermatol Surg* 1999;25:463-7.
5. Landthaler M, Hohenleutner U, El Rahmeen TA. Therapy of vascular lesions in the head and neck area by means of argon, Nd:YAG, CO₂ and flash lamp-pumped pulsed dye laser. *Adv Otorhinolaryngol* 1995;49:81-6.
6. Dover JS, Arndt KA. New approaches to the treatment of vascular lesions. *Lasers Surg Med* 2000;26:158-63.
7. Sadick NS, Weiss R. The utilization of a new yellow light laser (578 nm) for the treatment of class I red telangiectasias of the lower extremities. *Dermatol Surg* 2002;8:21-5.
8. Eremia S, Li CY. Treatment of face veins with a cryogen spray variable pulse width 1064 nm Nd:YAG laser: A prospective study of 17 patients. *Dermatol Surg* 2002;28:244-7.
9. Kim Y, Shin B, Chung B, Cho S. A simple technique for treatment of nasal telangiectasia using trichloroacetic acid and CO₂ laser. *Dermatol Surg* 2002;28:729-31.
10. Niamtu J. Clinical applications of the 532 nm diode laser for the treatment of facial telangiectasia and pigmented lesions. Literature review, history, and discussion of clinical experience. *Am J Cosmet Surg* 2001;18:71-81.

11. Schroeter CA, Neumann HAM. An intense light source. The photoderm VL-flashlamp as a new treatment possibility for vascular skin lesions. *Dermatol Surg* 1998;24:743-8.
12. Angermeyer MC. Treatment of facial vascular lesions with intense pulse light. *J Cutan Laser Ther* 1991:95-100.
13. Raulin C, Weiss R, Schönermark M. Treatment of essential telangiectasias with an intense pulsed light source (PhotoDerm VL). *Dermatol Surg* 1997;23:941-6.
14. Weiss RA, Goldman MP, Weiss MA. Treatment of poikiloderma of Civatte with an intense pulsed light source. *Dermatol surg* 2000;26:823-8.
15. Levy JL. Intense pulsed light treatment for chronic facial erythema of systemic lupus erythematosus: a case report. *J Cutan Laser Ther* 2000.
16. Hernandez-Perez E, Ibieta EV. Gross and microscopic findings in patients submitted to nonablative full-face resurfacing using intense pulsed light: A preliminary study. *Dermatol Surg* 2002;28:651-5.
17. Weiss RA, Weiss MA, Beasley KL. Rejuvenation of photoaged skin: 5 years results with intense pulsed light of the face, neck and chest. *Derm Surg* 2002;28:1115-19.
18. Fitzpatrick RE, Rostan EF. Double-blind, half-face study comparing topical vitamin C and vehicle for rejuvenation of photodamage. *Dermatol Surg* 2002;28:231-6.