

## Comparison of intense pulsed light (IPL) and pulsed dye laser (PDL) in port-wine stain treatment

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### Abstract

**Objective:** The pulsed dye laser (PDL) is the gold standard for the treatment of port-wine stains (PWS). However, intense pulsed light sources (IPLS) have often been used recently for PWS treatment not only due to their broader wavelength span which covers more than one absorption peak of hemoglobin, but also their larger spot size, and less purpura formation. An open 4-year prospective study was carried out to evaluate the clearing efficacy of second generation IPLS compared with PDL for the treatment of PWS.

**Materials and methods:** PWS patients were treated with both a PDL (PhotoGenica V-Star, Cynosure, USA; parameters: 595 nm, 7–10 mm, 0.5 ms, 4.6–7.8 J/cm<sup>2</sup>) and an IPLS (Ellipse Flex, Ellipse A/S, Denmark; parameters: 555–950 nm, 8 ms, 14–19 J/cm<sup>2</sup>). Each PWS was divided into pairs of equally red areas at the same localization. The left–right trial was continued with repeated treatments at 6–8 weekly intervals until one side showed improvement (partial or complete clearing) or caused side effects. The clearing of PWS was rated by clinical evaluation and the patient's decision regarding further treatment was documented. If the clinical evaluation was considered insufficient, before and after images, which were rated by impartial non-professionals, were included in the rating.

**Results:** One hundred patients (69 females, 31 males, aged 0.1–74.2 years, average 23.4 ± 14.9 years) with 130 PWS areas completed the comparison study after an average of 4.1 ± 2.0 repeated treatments (range 1–13). Sixty-four percent of the patients had not been treated before. Superior clearing of PWS by IPLS was found in 57.7% of the treated areas and this result is statistically significant ( $P < 0.0005$ ), whereas superior clearing of PDL was found to be 13.8%. No difference between treatment methods was found in 28.5% of the cases which included 6.9% of all treated PWS locations found to be non-responding to both treatment options. The superiority of IPLS clearing was also evident in the age subgroups, showing statistically significant differences in three of the four age groups. Fifty-nine percent of the patients or their parents decided to continue the PWS treatment with IPLS, whereas 19% preferred to continue with PDL. Other than purpura, the long-term adverse events following PDL treatment were hyperpigmentation and hypopigmentation, which occurred in 12 and three areas, respectively. By comparison, burns occurred in four areas after IPLS, two of them were caused by treatment of brown skin and one resulted from treatment of a lentigo within the PWS.

**Conclusion:** Second generation IPL technology proved to be superior in clearing PWS and was preferred by the patients for continuing treatment compared with PDL as long as it was used in non-tanned patients.