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SOURCE (OR PART OF THE FOLLOWING SOURCE):

Type	Dissertation
Title	Analysis of portwine stain disfigurement and pulsed dye laser treatment results
Author	P.H.L. Koster
Faculty	Faculty of Medicine
Year	2000
Pages	118

FULL BIBLIOGRAPHIC DETAILS:
http://dare.uva.nl/record/86379

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General introduction

Portwine stains are vascular birthmarks consisting of ectatic dermal blood vessels, that present as a pink, red or purple discoloration of the skin.[1] Portwine stains occur in approximately 0.3 percent of newborn children.[2] They can be differentiated from other capillary malformations, such as salmon patches and haemangiomas, by being present at birth and growing proportionally with its bearer. Over the years the lesion may become darker and nodular. Portwine stains can occur solitary or as part of a syndrome, e.g. Sturge-Weber[3] or Klippel-Trenaunay.[4] Portwine stains do not disappear by themselves, but they can be treated with the flashlamp pumped pulsed dye laser since it was introduced in 1985. This laser was specifically designed for cutaneous vascular lesions, based on the concept of selective photothermolysis.[5] The combination of wavelength and pulse duration results in highly selective thermal injury of the dermal vessels. Its introduction opened up the possibility of treating children. This was not possible with the argon laser, which was the treatment of choice before, because of the unacceptable high risk (40 percent) of scar tissue formation in children.[6,7] Several studies have emphasized the social and psychological burden of a visible disfigurement,[8-15] and it was expected that treatment early in life would diminish psychological disabilities. Also, early treatment of portwine stains might be more efficient, since portwine stains in children are smaller and not yet degenerated.

In 1992 the Dutch Health Insurance Council granted the study OG92-004, "Treatment of portwine stains by laser, the younger the better?" Aim of the project was to study whether portwine stain treatment with the flashlamp pumped pulsed dye laser would be more effective in younger patients, under the assumption that the answer would be affirmative.

In order to answer this research question 100 patients aged 0 to 31 yr with a previously untreated portwine stain in the head/neck region were treated with the flashlamp pumped pulsed dye laser. Fig. 1 shows the frequency distribution of the involved localizations. To objectively monitor treatment progress, patients were photographed under standardized conditions at the start of treatment, and color measurements were taken with a Minolta chromameter. Based on literature[16-21] it was expected that 4-6 treatments would be necessary to clear a portwine stain. During the course of the project

it became clear that 4-6 treatments would not suffice in the majority of our patients. Instead of simply comparing the number of treatments necessary to clear the portwine stains in the different age groups, it became necessary to assess preliminary results after 5 treatments of the entire portwine stains. In this thesis treatment results as measured with the chromameter are described. Also, treatment results were assessed using a questionnaire addressing a number of portwine stain characteristics. We developed this questionnaire because color measurements do no appreciate the changes brought about by laser treatment in other portwine stain characteristics such as size.

The psychological and economical aspects of flashlamp pumped pulsed dye laser treatment in childhood are dealt with in the PhD thesis of CAJM de Borgie.[22]

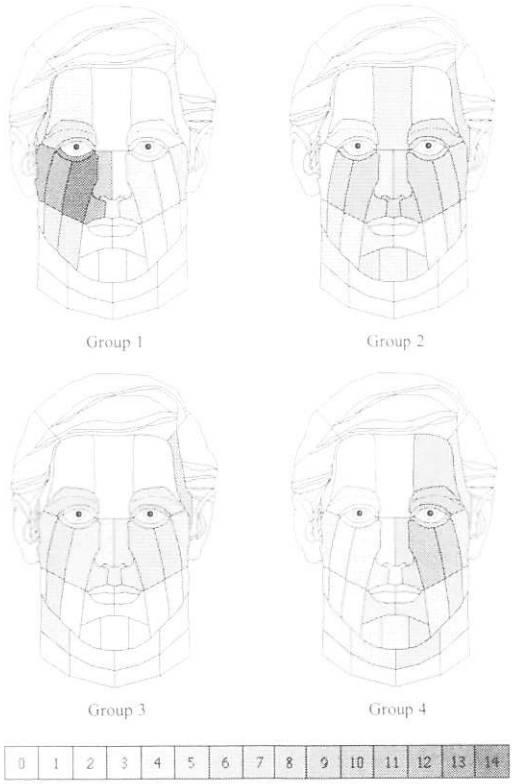

Fig. 1: Number of times a localization is involved, expressed in grey scale values, for each age group.