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General Introduction

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A port-wine stain is a benign, disfiguring vascular birthmark consisting of ectatic dermal capillaries. This congenital capillary malformation is relatively common occurring in an estimated 3-5 per 1000 births.[1,2] Approximately 90% of port-wine stains are found on the face or neck. It presents as a pink-to-red area which typically darkens to purple with age and grows in proportion to the general growth of the child's body.[3] Proliferative growth of port-wine stains has been found in two-thirds of patients by the age of 45.[4]

Currently the treatment of choice for port wine stains is the flash-lamp pumped pulsed-laser. Based on the theory of selective photothermolysis[5], this laser has brought a major advancement in the treatment of port-wine stains. Compared to the argon laser, used before, the flash-lamp pumped pulsed-dye laser shows a significantly lower risk of scarring and pigmentary changes in children.[6,7] This way the introduction of the flash-lamp pumped pulsed-dye laser opened up the possibility of treating port-wine stains at early ages.

A number of retrospective reports have been published highlighting the favourable patient outcomes of laser treatment of port-wine stains in different anatomical sites, different age-groups, different colors, with varying mean depth of vessels and in different skin types.[8-16] So far published studies have produced conflicting and contradictionary criteria to predict the outcome of treatment.

Sociological studies on attractiveness conducted in 1970s and studies of children with facial anomalies provided the rationale for treatment: people with a facial port-wine stain were assumed to suffer from psychological and social impairments. A number of studies has substantiated this claim.[17] Nevertheless, there are scarce, if any, convincing data on the amount and degree of these psychological implications from vascular malformation in children and their parents.

In this thesis studies on various aspects of the evaluation of treating facial PWS in childhood with the flash-lamp pumped pulsed-dye laser are reported. The thesis discusses the clinical aspects of measuring and analysing the effectiveness of laser treatment in relation to age. It also presents a outline of the way in which the flash-lamp pumped pulsed-dye laser has been introduced into clinical practice.

We first present a study on the effectiveness of the flash-lamp pumped pulsed-dye laser in relation to the age of onset of treatment (*chapter 1*). Hundred patients aged 0 to 31 years with an untreated facial port-wine stain were treated with this laser modality. Patient outcomes were evaluated prospectively after an average number of 5 treatments. The assessment of clearance of the port-wine stain was based on an objective color measurement taken with a colorimeter (Minolta chromameter).

Chapter 2 describes the psychosocial adjustment of children and adults with a facial port-wine stain. The answer to the question whether treatment during childhood is cost-effective is given in *Chapter 3*, which describes the results of a study assessing the incremental costs and effects (in terms of medical consumption and clinical outcomes) of treating several age-groups with the FPDL. This cost-effectiveness study, like all other parts of this thesis, was linked to the prospective clinical cohort study represented in the first chapter.

Our experiences with treating children with a facial PWS for several years undergoing FPDL treatment is described in a systematic way in *chapter 4*. There we describe the practical application of the laser therapy in the clinical management of infants and young children. Treating children is not as simple as was suggested in the early nineties. Complete clearance is seldom achieved. A great majority of patients requires multiple treatments, even in childhood. The introduction of general anesthesia brings an element of risk to the treatment procedure that can be subject to dispute.

Chapter 5 specifically focuses on the assessment of the flash-lamp pumped pulsed-dye laser treatment in. In this chapter satisfaction with the overall outcome of laser treatment and the assessment of the treatment procedure itself were evaluated.

Chapter 6 presents a survey regarding the diffusion of the flash-lamp pumped pulsed-dye laser into port-wine stain treatment and its use between 1994 and 1999 in the Netherlands.

Chapter 7 discusses the introduction of laser treatment of PWS at early ages from the perspective of Health Care Technology Assessment: the planned, systematic search for sound data on various aspects of new technologies in order to support rational decision making on issues of introduction, diffusion and acceptance.

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