



## Case report

## Excellent cosmetic result of daylight photodynamic therapy for facial flat warts in a child

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## ABSTRACT

FFW are among the most frequent infectious skin conditions. Although several pharmacological and physical topical treatments are available, results are often unsatisfactory in terms of efficacy (frequent recurrence) and cosmetic outcome (risk of scars, hyper- or hypopigmentation). We describe the case of multiple recalcitrant facial flat warts treated by daylight photodynamic therapy (DL-PDT) in an otherwise healthy 8-year-old female child, with complete clearance and excellent cosmetic result. The advantages of DL-PDT over conventional PDT in terms of tolerability, time and cost, especially in paediatric setting are discussed.

## 1. Introduction

Facial flat warts (FFW) are a very common infectious skin disease caused by human papillomavirus (HPV). Conventional therapies, including topical keratolytic agents, electrosurgery, cryotherapy and carbon dioxide laser may cause scars, inflammatory reactions and hyper- or hypopigmentation, with high risk of treatment failure and recurrence [1]. Furthermore, such treatments are often contraindicated or not tolerated, especially in children. In general, lesion-directed therapies are not fully effective to eradicate HPV infection, in particular in subclinical and latent conditions. Recently, conventional photodynamic therapy (c-PDT) has been used on FFW with good cosmetic results, better compliance and lower recurrence rates [2,3]. However, c-PDT shows some limits: it is accompanied by pain during illumination, is time-consuming and requires dedicated equipment [4]. Daylight PDT (DL-PDT) offers advantages over c-PDT in terms of tolerability, time and cost, making this procedure more suited to the paediatric setting.

Here we report the case of multiple recalcitrant FFW successfully treated by DL-PDT in an 8-year-old female child.

## 2. Case report

An otherwise healthy 8-year-old female child presented to our Department because of a 1-year history of several warts grouped on eyelids, cheeks and nose (Fig. 1a), with multiple relapses after topical treatments (tretinoin) and cryosurgery. Due to patient's young age and poor compliance to physical therapies available in our hospital, she was

scheduled to begin DL-PDT.

On the day of treatment, an organic sunscreen with a sun protection factor of 30 was used on all sun-exposed areas and, after 15 min, aminolevulinic acid (ALA) cream was applied in a 1-mm thick layer to the entire treatment area and left uncovered for 30 min indoor. The patient was then invited to expose herself continuously to daylight for 2 h in the hospital garden close to the clinic. At the end of daylight exposure, residual ALA cream was wiped off, followed by application of lenitive cream. The patient was instructed to avoid daylight for the following 24 h. She complained of mild burning sensation only. The procedure was repeated after one month with the same modality. Six weeks after the last treatment (Fig. 1b), complete clearance without scarring was recorded, with no recurrence at one-year follow-up.

## 3. Discussion

FFW are among the most frequent infectious skin conditions. They appear as small, slightly raised, skin colored papules, alone or in group, and are commonly found in children and young adults.

Although several pharmacological and physical topical treatments are available (keratolytic agents, electrosurgery, cryotherapy, carbon dioxide laser), results are often unsatisfactory in terms of efficacy (frequent recurrence) and cosmetic outcome (scars, inflammatory reactions, hyper- or hypopigmentation) [1].

The ideal therapy for FFW, especially in children and aesthetically relevant body areas such as eyelids, should be effective, safe, time-saving, with low risk of dyschromias and scars.

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Fig. 1. Skin-colored papules grouped on eyelids, cheeks and nose, A) before treatment and B) six weeks after the second session of daylight photodynamic therapy with ALA.

c-PDT is a widely employed non-invasive treatment, useful not only for non melanoma skin cancer (NMSC), but also for inflammatory/infectious skin diseases, such as acne vulgaris, psoriasis, necrobiosis lipoidica and viral warts [4,5]. It consists in the topical application of a photosensitising agent (usually 5-ALA or its methyl ester 5-methylaminolevulinic acid), precursor of protoporphyrin IX in the biosynthetic pathway of heme, followed, after an incubation time of some hours, by exposure of the lesions to an adequate source of artificial light for several minutes.

DL-PDT is a novel procedure in which the activation of the topical photosensitizer is induced by exposure to natural daylight, without requiring preliminary occlusion. The absence of occlusion, with consequent less time spent at the clinic and the possibility to perform the treatment in an outdoor setting, may increase the compliance of young patients.

In addition, pain intensity during DL-PDT is significantly lower than with c-PDT, probably because of gradual and continuous production and photoactivation of smaller amounts of protoporphyrin IX, minimizing the little patient's discomfort during irradiation [4,6].

Many clinical studies have reported the safety and efficacy of c-PDT for patients with FFW [2,3]. Only one research described positive

outcome of DL-PDT with topical 10% methylene blue gel. To the best of our knowledge, this is the first report describing the effectiveness of DL-PDT using ALA as photosensitizer for the treatment of FFW. In our case, therapy was well tolerated by the young patient and clearance of warts was achieved after only two sessions, with minimal side effects and no recurrence at one-year follow-up.

In conclusion, our case shows that DL-PDT using topical ALA is an effective and safe therapy for FFW in children and may represent a useful alternative treatment modality with tolerable side effects.

The technique is easy to implement, resulting in minimal costs, high tolerability and good cosmetic results with no recurrence.

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#### Conflicts of interest

None declared.

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