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THE EUROPEAN SOCIETY FOR PHOTODYNAMIC THERAPY

NICE, FRANCE | 16 & 17 MARCH 2018

PROGRAM

17th Annual Congress | www.euro-pdt.org
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CONGRESS VENUE
Le Méridien Nice
1 Promenade des Anglais
06000 Nice
Dear Colleagues.

It is with pleasure I wish you welcome to the 17th EURO-PDT Congress which is the largest PDT for Dermatology Congress in the world. Most of the participants are Europeans, but we also have participants from other parts of the world. We have put together a program with PDT experts presenting their latest hottest news in scientific and clinical PDT. We hope that you will like the program and that you will profit from it, scientifically and/or clinically. It also offers an excellent opportunity to discuss with colleagues, exchange views and share experience; and to enjoy company at the congress dinner.

We want to thank Galderma for its generous support to EURO-PDT and this congress. Without that support we could not have organized it. On behalf of us all, a great thank you to Galderma.

Prof. Lasse R. Braathen
President of EURO-PDT
Dear Colleagues,

Welcome to Nice! Welcome to the 17th Annual Congress of the European Society for Dermatology!

I enjoy the sight of the empty line of chairs on the promenade here, as illustrated on our meeting book, reminding me of the calm at the end of a busy clinic! I wish you all the chance to escape the clinic over the two days of our meeting and enjoy high quality presentations by many of the experts in PDT from across Europe (yes, including UK !) and Brazil.

This year, we consider the place of PDT within disease-specific guidelines, provide updates on current studies, and consider the widening use of daylight PDT. We consider variations in protocol for delivery of PDT as well as opportunities around combination therapy.

We look forward to enthusiastic interactions as we digest the latest research, and later, digest hopefully an equally enticing congress dinner.

Thank you to all contributors and participants for taking the time to meet together for what we hope will be a stimulating meeting.

Welcome and enjoy!

Colin Morton
Congress President
SESSION 1  EPIDEMIOLOGY AND GUIDELINES FOR AK AND NMSC

Chairs  Lasse Braathen, Switzerland / C.A. Morton, Scotland

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C. Ulrich, Germany / S. Ibbotson, UK

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Y. Gilaberte, Spain / R.E. Hunger, Switzerland

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**Chairs**  R.-M. Szeimies, Germany / A.-M. Wennberg, Sweden

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Glossary

AK - Actinic Keratosis
ALA - Aminolevulinic Acid
BCC - Basal Cell Carcinoma
nBCC - Nodular BCC
sBCC - Superficial BCC
CR - Complete response
Fx - Fractional
DL-PDT - Daylight PDT
LED - Light-Emitting Diode
MAL - Methyl Aminolevulinate
NMSC - Non-Melanoma Skin Cancer
PDT - Photodynamic Therapy
PpIX - Protoporphyrin IX
SCC - Squamous Cell Carcinoma
SD - Standard Deviation
VAS - Visual Analogic Scale
NMSC are the most frequent cancers in adult patients. Their incidence is increasing worldwide both in men and in women but their mortality is stable or decreasing. The rising incidence is due to various factors such as UV or sunlight exposure, increased outdoors activities, change in clothing style, increased longevity etc. In France the incidence has tripled between 1980 and 2012. Comparable increase are noted in other European countries. A continuous long-term increase of the NMSC incidence has been observed in Germany in the past decades and is expected to continue to increase.

Fair skin people and immunsuppressed patients are more at risk to develop NMSC. Some genetic disease also predispose to NMSC. UV is the major carcinogen involved in NMSC development. Whereas BCC is classically more related to intermittent sun exposure in childhood and SCC to chronic sun exposure, recently the increased risk of BCC in outdoor workers has been reported. Socio economical status seems to be strongly associated with a higher risk of BCC but not SCC. In conclusion both the NMSC risk will probably continue to substantially increase in the future because of increased UV exposure and an aging population. On the contrary, NMSC mortality at the same time will remain stable or even decrease.

Non-melanoma skin cancer (NMSC) was recognized in 2015 as an occupational disease for outdoor workers in Germany and poses an enormous socioeconomic burden. This has led to the continuous demand of evidence-based prevention. However, studies assessing the perceptions, beliefs and risk behaviour of outdoor workers as an essential prerequisite for prevention are rare. To assess perceptions, beliefs, and risk behaviours towards NMSC among different outdoor groups as a basis for the development of sustainable prevention programmes, we performed a cross-sectional study among 353 farmers, gardeners and roofers using a 20-question online survey. Of these, 153 (43.4%) reported never to use sunscreen during work. Wearing headgear and long pants were the most common sun protection measures. A low perceived skin cancer risk was significantly associated with poor use of sunscreen, long-sleeved shirts, sunglasses and headgear. Despite great evidence on NMSC risk in outdoor professions throughout the literature, high-risk groups in fact are not yet aware of the topic. Sustainable target group-oriented awareness prevention programmes are needed to lower the immense burden of NMSC.

Key Words: Non-melanoma skin cancer, NMSC, outdoor workers, risk behavior
AK area and severity index (AKASI) is a new quantitative tool for clinical evaluation of actinic keratosis (AK) at the head. In clinical trials the severity of individual AK lesions is commonly graded using the clinical classification system of Olsen et al. or the histological classification of Röwert-Huber et al. Both of these systems share the limitation that they assess only the severity of individual lesions and do not take into account the entire area affected by AK.

Clinical trials on new AK therapies typically evaluate their efficacy based on AK lesion counts before and after treatment. The principal limitation of this approach is that in many AK lesions do not exist as discrete entities, but may rather coalesce across the affected field. This makes it difficult, even for expert dermatologists, to accurately assess AK lesion numbers. AKASI has been developed to overcome these problems. It represents the first attempt to quantitatively assess the severity of AK across an entire affected field. AKASI addresses the unmet need for a more accurate scoring system. The results of a pilot validation study showed that AKASI and physicians’ global assessment (PGA) are highly correlated.

AKASI demonstrates a useful tool to evaluate treatment outcomes and has meanwhile been implemented in a good number of clinical trials.
Reflectance confocal microscopy (RCM) is a noninvasive tool that proved to be helpful in the diagnosis of nonpigmented skin tumours. RCM enables visualization of architectural and cytological structures at nearhistological resolution. It can improve the diagnostic accuracy of dermoscopically equivocal solitary pink neoplasms.

For management decisions, it is important to identify specific morphological clues that allow bedside classification of nonpigmented skin neoplasms into benign versus malignant and melanocytic versus nonmelanocytic. More specifically, the presence of a nested melanocytic proliferation at the dermoepidermal junction or dermis level permits the clinician to ascribe a given lesion as melanocytic; the identification of basaloid bright tumour islands is a key RCM feature for the diagnosis of basal cell carcinoma; and the presence of disarrayed epidermis along with small demarcated papillae is suggestive for the diagnosis of squamous cell carcinoma. Here we present a comprehensive description of the main RCM diagnostic clues for pink lesions that direct clinicians to the correct diagnosis.
Actinic keratoses (AKs) are regarded as early in-situ SCC which have the potential to progress into invasive tumors and subsequently metastasize. As the incidence is increasing steadily, reliable risk stratification of patients enabling physicians to make adequate treatment decisions are needed. However, current biomarkers do not predict a possible progression risk of AK lesions. They have commonly aimed at epidermal structures, but recent approaches indicate an important role of dermal factors such as cancer associated fibroblasts (CAF). Moreover, promising results have been reported regarding growth patterns, gene-expressions or mutations in AKs. Among others, Fibronectin (FN1), Cadherin 3 (CDH3), Kallikrein related peptidase 6 (KLK6), Peptidase Inhibitor 3 (PI3), and kinetochore gene (KNSTRN) might allow for a risk stratification due to a specific algorithm taking underlying gene mutations of a distinct patient into account.

In case of progression, cutaneous SCCs are typically associated with low rates of metastasis and high survival rates. Nonetheless, metastatic cutaneous SCC is a significant health threat; up to 8800 individuals die each year of this disease. Thus, biomarkers especially for advanced tumors predicting their metastasizing potential or for metastatic tumors evaluating therapeutic outcome of different treatment approaches are desirable. For example, a recent study showed podoplanin to be an independent prognostic parameter for metastasis. Another study revealed elevated frequencies of CDB T cells expressing PD-1, CTLA-4 and Tim-3 within tumor from perineural SCC patients.

Although these results offer a bunch of possible biomarkers, they have to proof benefits and reliability in clinical practice.

**Background:** MAL-PDT is an excellent option for Bowen’s disease (BD) and Basal Cell Carcinoma (BCC) however, sometimes, resistance occurs.

**Objective:** Determine biomarkers of better/worse response to MAL-PDT.

**Material and methods:** A retrospective study (2006-2015) of 68 BD and 390 BCC patients treated with MAL-PDT in Hospital San Jorge (Huesca, Spain) was performed. Sociodemographic, clinical, histological and immunohistochemical characteristics were studied. Additionally, the in vitro response of SCC (SCC-13 and A-431) and BCC (ASZ and BSZ) cell lines, resistant or not to MAL-PDT, was evaluated.

**Results:** In both types of tumours, BD and BCC, and also in cell lines, P53 expression was associated with good response to MAL-PDT. Higher expression of cyclin D1 and EGFR was associated with poor response to MAL-PDT in BD, whereas peripheral reinforcement for β-catenin was associated in BCC.

**Conclusion:** p53, cyclin D1, EGFR in BD and p53, β-catenin in BCC might be possible biomarkers to select those patients more suitable to be treated with MAL-PDT.
The objective of this study was to collect real-world clinical data on the use of methyl aminolevulinate daylight-photodynamic therapy (MAL DL-PDT) for the treatment of face/scalp AK in Europe. A prospective, multicenter, noninterventional study was conducted in 6 European countries in patients receiving a single treatment of MAL DL-PDT for face/scalp AK. Patient-reported outcomes were assessed by questionnaires at baseline and at 3 months after treatment, efficacy at 3 months using a 6-point global improvement scale, and adverse events (AE) at each visit. Overall, 325 patients were enrolled from 52 centers, 314 of whom attended the 3-month visit. Most patients had multiple lesions (58.4% had >10 lesions), mainly located on the scalp (60.0%) and/or forehead (54.2%). AK were predominantly grade I (39.4%) or grade II (33.2%) and 10.5% of patients had grade III lesions. The proportions of patients and physicians that were overall satisfied to very satisfied with MAL DL-PDT were 80.4% and 90.3%, respectively. The vast majority of patients (90.0%) would consider using MAL DL-PDT again if needed. Physician-assessed efficacy at 3 months was at least much improved in 83.5% of patients, with 45.9% requiring no retreatment. Related AEs were reported in 15% of patients. In conclusion, use of MAL DL-PDT for multiple face/scalp AK resulted in high levels of patient and physician satisfaction in clinical practice in Europe.

Key Words:
AK, MAL, DL-PDT, observational study

Advancing Light Sources for PDT
Ewan Eadie
Dundee, UK

DL-PDT is an established, almost pain free, treatment for field change AK. However, it is limited to non-rainy days during months when the temperature is comfortable for patients. To overcome these limitations, a novel wavelength and uniformity tunable light source was developed. This proprietary technology replicated the spectral distribution of a protoporphyrin-IX (PpIX) weighted solar spectrum and delivered uniform illumination to both flat and curved surfaces.

The PpIX effective irradiance of the light source, measured at a distance of 10 cm, was 1.2 mWcm-2 and for a treatment duration of 2 hours, the PpIX effective radiant exposure was 8.3 Jcm-2. This light source provided uniform illumination (Coefficient of Variation (CV) 6%) over a large treatment area (35 cm x 20 cm) and could also be manipulated to improve uniformity on curved surfaces, such as the lower leg (initial CV 25%; final CV 8%).

Key Words:
DL-PDT, light source, uniformity, spectral irradiance, PpIX effective radiant exposure, AK
In this multicenter, prospective, randomized, controlled, two-armed, observer-blinded trial, patients with a minimum of 5 mild-to-moderate AK on photodamaged facial skin are randomly allocated to either DL-PDT with MAL or cryosurgery. In the DL-PDT group, 5 treatments of the entire face are conducted over the course of 18 months. In the control group, lesion-directed cryosurgery is conducted at the first visit and, in the case of uncleared or new AK lesions, also at visits 2 to 5. The efficacy of the treatment is evaluated at visits 2 to 6 by documenting all existing and new AK lesions in the face. Cosmetic results and improvement of photoaging parameters are evaluated by means of a modified Dover scale. Primary outcome parameter is the cumulative number of AK lesions observed between visits 2 and 6. Secondary outcome parameters are complete clearance of AK, new AK lesions since the previous visit, cosmetic results, patient-reported pain, satisfaction with cosmetic results, and patient-reported quality of life. Safety parameters are also documented.

This clinical trial will assess the efficacy of repetitive DL-PDT in preventing AK and investigate rejuvenating effects.

This was a prospective investigation including, in the second half of 2016, in France, 154 dermatologists using daylight PDT. Daylight MAL PDT showed its effectiveness and tolerance in the management of mild to moderate KA. Simple to use, achievable even on cloudy days with only one exhibition session to the daylight, DL-PDT presents two advantages over MAL-PDT conventional - the lack of specific equipment needed; - the minimization of pain by the lengthening of the illumination time (about 120 minutes in the daylight versus 10 minutes with the LED in Conventional PDT).

Compared to other topical treatments for actinic keratosis, MAL-PDT has the advantage to treat in one sitting fields of cancerization.
Very few studies have systematically investigated the effects of PDT on actinic keratoses (AKs) of the extremities, that appear to be more resistant and difficult-to-treat than AKs on the face and scalp. We report the preliminary data on the use of daylight-PDT using methyl aminolevulinate cream for AKs on the forearms. A retrospective analysis was performed by reviewing medical records of 22 patients with multiple refractory AKs located on the forearms. After the application of a 10% urea cream for 10 days, DL-PDT was performed with two sessions one week apart. The response of AKs was assessed at 3 months after the last session. The two-sided Wilcoxon rank signed test was used to analyse the change of the number of AKs; a p-value $<0.05$ was considered statistically significant. A significant improvement was observed 3 months after treatment, with a mean complete response rate of 74% for total lesions ($p<0.0001$).

### Key Words:
- AK, DL-PDT, forearms, extremities, MAL, response

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**Daylight PDT for AK on forearms**

Carlotta Fai  
Lecce, Italy  
Dario Fai

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Daylight-PDT with MAL (DL-PDT) for the treatment of actinic keratoses (AK) now has a history of more than 10 years, starting in an University-based institution in Copenhagen to now a world-wide registered drug and procedure which is also implemented in current guidelines of care of AK.

However, disease distribution and awareness, different health care systems, access of patients to specialists and economic aspects in Europe and elsewhere influence the distribution and offer within the variety of treatment options for AK.

During this 20 min session, we like to learn from you in the audience, representing Europe’s best specialists on the use of PDT in their countries, how DL-PDT has influenced your behavior in the overall treatment of AK, if there are still unmet needs, both from medical or economical standpoints. Using modern smartphone-based technology (www.mentimeter.com), we like to engage you with realtime voting in this audience-based survey.

### Daylight PDT in Europe - An Auditorium-Based Survey

Rolf-Markus Szeimies  
Recklinghausen, Germany

Colin A. Morton, Lasse R. Braathen

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**Key Words:**
- DL-PDT, AK, audience-based survey
DL-PDT can now be considered as a reference treatment for diffuse mild to moderate actinic keratosis.

The aim of the present study was to determine the feasibility and efficacy of home based DL-PDT.

16 patients have been included (15M/1F average age 76 yrs). The average number of AK was 25 Grade 1-2 [12] 1-3 [4] At day 1 the protocol was explained to the patient with a prescription of a keratolytic ointment (urea 30%) At day 15 AK were gently curetted, a template and photographs were taken The patient had a prescription of sunscreen and MAL. The treated area was clearly defined with the patient who was supposed to perform the PDT within the next four days. 14 patients were evaluable at M1 : the response rate was 87%. 9 patients were evaluable at M3 with a response rate of 88%. 80% presented with new AKs on the target zone. 7 patients were evaluable à M6 with a response rate of 88% (74.4% with new AKs).

The median VAS was 2. 12/14 patients had redness and mild burning. Only 1/14 had a persistent inflammation →3D. One patient presented with a facial zoster at Day 8.

Our results are very similar to previously reported results for DL-PDT. Therefore we conclude that home based daylight PDT is a safe and efficient procedure and can be easily proposed to the patients for the treatment of mild to moderate AKs.

MAL-PDT is highly effective for the treatment of superficial basal cell carcinoma (sBCC). However, current European MAL-PDT protocol requires at least two hospital visits, which is costly and unpractical for patients. Fractionated ALA-PDT has shown to be more effective as compared to a single illumination session. The aim of the present study was to study fractionated MAL-PDT in sBCC in a randomised multicenter pilot trial.

Material and methods: Twenty-one patients were included in the analyses. They were randomized into two groups. The first group (n=11) received illumination at 3 and 4 hours [20 + 55 J/cm²] after MAL-application. In the other group (10), illumination was performed at 3 and 5 hours [20 + 55 J/cm²]. The lesion response was evaluated at 3 and 12 months after treatment. The Mann-Whitney test and Fisher’s exact test were used to compare continuous and categorical variables between groups, respectively.

Results: In the first group 80.0% showed a complete response at 3 months compared to 90.9% in the other group. At 12 months, 80.0% showed still a complete response in the first group, compared to 72.7% in the other group. There were no significant differences between these groups. Five treatment failures/recurrences occurred, of which 3 appeared to be mixed type BCCs.

Conclusion: In this pilot study, MAL-PDT, using two illumination sessions on the same day, seems to be effective in the treatment of sBCC.
Organ Transplant Recipients (OTRs) are susceptible to premalignant lesions and keratinocyte skin cancer. Management can be challenging. There are few data regarding dPDT in OTRs. The aim of this study was to collect pilot data regarding efficacy and tolerability of dPDT for renal transplant patients. Hyperkeratotic (grade 3) AK were excluded from the study. Male participants (n=5) between 3-39 years post-transplant were recruited from dermatology specialist transplant clinics in the United Kingdom. Patients were treated with Dpdt as per protocol. All patients reported no pain during treatment. At 3-month follow up, 3/5 patients achieved complete clearance of the treated areas. One patient achieved 50% clearance but AK recurred in all sites after 6 months. One patient also achieved partial response. All participants expressed a preference for further dPDT in the future. This pilot study has indicated high levels of patient satisfaction and tolerability, although further data are required to determine efficacy.

The increasing use of immunomodifying drugs for the treatment of autoimmune and autoinflammatory diseases significantly adds to the induction and, even more often, to the promotion of skin cancer.

Both effects have been thoroughly studied in the well established peer-group of chronic immunosuppression - solid organ transplant recipients (OTR). Paralleling decreasing rates of graft loss due to acute rejections and overall improving graft and patients survival rates, malignancies have become one of the greatest limitations of many transplantation programs. Skin cancers, and especially invasive squamous cell carcinomas dominating skin cancer statistics in OTR, are frequently more aggressive, than in immunocompetent patients.

However, primary as well as secondary prophylaxis (including modern field therapy measures for actinic keratoses) have shown a significantly protective impact on the development of skin cancer. An interesting approach to control NMSC in OTR is the use of DL-PDT. New evidence in the literature indicates that DL-PDT, either alone or augmented by laser pretreatment, as field-directed approach sufficiently controls the development and course of AK, thus minimizing the inhibiting side effects like pain and discomfort.
Skin pretreatment has the potential to ensure adequate penetration of photosensitizing agents and to improve PDT efficacy. Several techniques are being used to boost treatment outcomes for actinic keratoses, including fractional lasers, dermabrasion and microneedling.

This talk will provide an overview of existing preclinical and clinical data, focusing on efficacy rates and clinical procedures.

Ultraviolet photodamage is an increasing health issue, especially in fair skinned people living in southern countries.

Actinic keratosis (AK), the most common premalignant lesion, needs to be appropriately treated because of the risk of transformation into invasive squamous cell carcinoma.

Daylight photodynamic therapy (DL-PDT) is an efficacious technique for patients who present large areas of chronic actinic damage and easy access to sunlight.

DL-PDT is a simple, almost painless, and convenient treatment, addressing not only multiple visible AK’s but also subclinical ones, approved for grade I/II AK’s on the face/scalp, with efficacy similar to conventional PDT.

The presentation covers real life experience with DL-PDT for various grades of photodamage, different sites involved (face, scalp, trunk) reporting side effects and results both in short and long term.

The results obtained confirm the data from literature and validate the efficacy of DL-PDT as a first line regimen for actinic field cancerization treatment.

Key Words:
AK, Actinic field cancerization, DT-PDT, MAL, Non melanoma skin cancer, Photodamage
**Objectives:** To compare the efficacy and safety of the combination of topical calcipotriol (CAL) before methylaminolevulinate (MAL)-PDT for AKs of the scalp versus conventional MAL-PDT in a randomized controlled-clinical trial.

**Materials and Methods:** Twenty patients with multiple AKs on the scalp were randomized to receive conventional MAL-PDT with previous curettage on one side of the scalp and CAL-assisted MAL-PDT applied once a day for fifteen days before the illumination with red light-emitting diode (37J/cm²) on the other side. After three months, patients were evaluated for the clearance of AKs, side effects and histopathology before and after the procedure. Protoporphyrin IX (PpIX) fluorescence was measured before and after illumination on both sides.

**Results:** All twenty patients completed the study. Overall AK clearance was 92.07% and 82.04% for CAL-PDT and conventional PDT respectively (p<0.001). The AKs grade I showed similar response rate of 92.83% and 87.29% (p=0.055) respectively for CAL and MAL-PDT sides. However, AKs grade II showed more improvement on the CAL-PDT side (89.55%) compared with MAL-PDT (62.90%) (p<0.001). Before illumination, PpIX fluorescence intensity was higher on the CAL-assisted side (p=0.048). The treatment was more painful on the CAL-PDT side, although well tolerated. The mean VAS score was 5.40±1.43 on the CAL-PDT side and 3.95±0.69 on the conventional MAL-PDT side (p=0.001). Side effects such as erythema (p=0.019), edema (p=0.002), crusts (p<0.001) were more pronounced on the CAL-assisted side. Histopathological analyses were obtained from five patients and both sides showed improved keratinocyte atypia following PDT, with a slight more improvement on CAL-assisted side.

**Conclusion:** CAL-assisted PDT proved to be safe and more effective than conventional MAL-PDT for the treatment of AKs on the scalp. CAL pretreatment increased PpIX accumulation within the skin and may have enhanced the efficacy in this first human trial. As this is the first CAL-assisted PDT study in human skin, further and larger trials are needed to corroborate our findings.

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**Can Daylight PDT be improved with combination therapy?**

**Stefano Piaserico**

Padova, Italy

Daylight photodynamic therapy (DL-PDT) is a treatment for immuno-competent patients with grade I or II AKs or fields of actinic damage on face and scalp.

One of the main limitation of DL-PDT is thick AKs. Moreover, DL-PDT shows efficacy rates approximately 20% lower on the extremities compared with the face and the scalp.

Only sparse data are available on the combination therapy of DL-PDT with other strategies in order to improve DL-PDT efficacy.

One study showed that sequential treatment with 5% 5-FU and DL-PDT is superior to DL-PDT alone for grade I-II AKs on the extremities.

Another study reported that ablative fractional laser combined with DL-PDT was significantly more effective than DL-PDT for AK treatment in organ transplant patients.

Finally, a recent study showed that pretreatment with calcipotriol prior to DL-PDT resulted in improved complete response rates compared with DL-PDT alone.

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**Conventional PDT combined with vitamin D study results**

**Luis Torezan**

Sao Paulo, Brazil

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**Key Words:**

Calcipotriol, PDT, PpIX, AK
Reaching low but still sufficient PpIX levels without curettage

Hans Christian Wulf
Copenhagen, Denmark

Ida Marie Heerfordt, Giedre Bieliauskiene

Pulse PDT with removal of MAL after 30 minutes is the gentlest form of PDT. It results in lower PpIX accumulation than daylight PDT but with full effect on AKs. We investigated when PpIX formation in conventional PDT without curettage reached the PpIX level in pulse PDT with curettage.

Fourteen patients had two areas allocated to: (i) MAL application without prior curettage (+CUR) and (ii) 30 minutes MAL incubation after curettage (+CUR). The PpIX levels were measured up to 6 hours after MAL application. No illumination was performed.

After 3 hours the median PpIX level in +CUR areas was 22 AU, representing the PpIX amount which can be photobleached in pulse PDT with full treatment effect, and the median PpIX level in +CUR areas was 20 AU, not significantly different from the level in +CUR areas.

PDT with 3 hours of MAL incubation without curettage might provide full treatment effect.

Longer MAL incubation versus curettage in daylight PDT.
A clinical study

Hans Christian Wulf
Copenhagen, Denmark

Ida Marie Heerfordt

DL-PDT has become routine to avoid pain and reduce inflammation. However, curettage is still a prerequisite prior to MAL application to increase MAL penetration into the skin. Curettage is inconvenient and painful and may result in oozing and bleeding which might interfere with MAL absorption.

We investigated if curettage could be avoided by changing the illumination time from 60 minutes to 180 minutes after MAL application. By doing this the cure rate after 3 months was 85% and identical for both daylight PDT with curettage and without curettage. Pain and inflammation were not reduced by avoiding curettage.
The planar shape of current light sources used for photodynamic therapy (PDT) of actinic keratoses lead to inhomogeneous light distribution on lesions located on curved parts, such as the scalp. Moreover, PDT is known to be very painful.

Resulting from a European project, PHOSISTOS, based on light emitting fabrics (LEF) was developed to overcome those drawbacks. This helmet consists of a 3D printed frame and a flexible structure composed of optical fibers. Besides its original design, the project aims to demonstrate that an illumination performed 30 minutes after MAL application (Metyx® - Galderma, Lausanne, Switzerland), with a low irradiance (1.33 mW/cm²) during 2h30, and a reduced fluence (12 J/cm²) is as efficient as the conventional protocol and less painful, in a comparative (split face intra-individual comparison), randomized, bi-centric, phase II study.

Preliminary results show that PHOSISTOS is effective in the treatment of AK with pain scores much lower than the conventional protocol (0.7/10 versus 7.3/10).

PDT is a well-established treatment for actinic keratoses. In Europe, the approved protocols involve irradiation with either the Akti-lite CL128 or the daylight, while irradiation with the Blu-U is approved in the United States. Many other protocols involving irradiation with other light sources have also been proven to be efficient.

In this study, we compared the effective light doses from ten protocols with clinically proven efficiency. We have also investigated the relation between the effective light dose and the complete response rate.

Effective light doses from the protocols involving irradiation with daylight, white light or blue light are higher than those involving red light illumination. However, no association between the complete response rate and the effective light dose was found. Hence, preference shall be given to the protocols with high complete response rates and low pain scores regardless of the effective light dose.
PDT is a wide extended therapeutic modality with an established protocol and determined light sources. In the last years, there have been advances in integrating new sources as daylight or home devices. There is a recent interest in developing new sources of light for PDT included or integrated into fabrics or body covers. This tendency started in the first decade of the 2000’s (LED in fabrics like Ambulight®), and new several assays with LEDs and even optic fibers have been developed.

Relating head devices for PDT illumination there is scarce data about this line of research, although there is increasing evidence of use with the advent of new head covers able for PDT (for example the PHOSISTOS® project).

In this communication, a review of current research and types of helmets or caps for the PDT procedure on the scalp will be discussed, with the presentation of a new study using low-level laser therapy (LLLT) head devices for PDT.

Topical photodynamic therapy [PDT] usually employs hospital-based LED irradiation. Improved access to PDT and convenience for patients is important and portable, low irradiance LED devices are appealing. The Photobiology Unit, Ninewells Hospital, Dundee and the University of St Andrews developed low irradiance LED devices for portable PDT (Ambicare Health Ltd). Initial experience indicated low pain scores, high efficacy and satisfaction. A randomised, prospective clinical trial comparing conventional and ambulatory PDT in 50 patients with Bowen’s disease or superficial basal cell carcinoma (≤2.4 cm diameter) was undertaken. This showed low pain scores for both conventional and ambulatory PDT and high clearance rates at one year, with no significant differences seen. This confirms that ambulatory PDT is an effective option for selected patients. The study also emphasises that size of the lesion is an important determinant for tolerance of PDT, with small lesions being readily treated relatively painlessly by PDT.
**Cost effectiveness of DL-PDT**

**Piergiacomo Calzavara-Pinton**
Brescia, Italy

**Background:** The cost of topical treatments for actinic keratosis (AK) have never evaluated with respect to the actual cancerization field which requires treatment and the lesion response rate. Traditionally, evaluation in AK has been done in the context of patient response rate only.

**Objective:** To develop an economic model assessing the cost of topical treatment, per surface treated, per lesion and per lesion cleared for the management of AK in Italy.

**Methods:** Patient data was obtained from an observational study conducted in Italy, which included 100 patients with five or more mild or moderate lesions on the face and/or scalp. Efficacy of treatments available for AK, c-PDT and DL MAL PDT, DHA, IMQ 5% and ImMeb was considered at three months and was derived from lesion response rates obtained from literature. The cost of each treatment was calculated based on the approval status of the drug, the literature data and the area that could be covered by 1 tube/sachet, i.e. the cancerization area that required treatment.

**Conclusions:** The cost of treatment in actinic keratosis is highly dependent on the surface area treated and cost per successful lesion treated of each topical treatment should be calculated for cancerization area. Based on the analysis, daytime therapy with methyl aminolevulinate (MAL DL PDT) is, therefore, an effective treatment option for AK treatment with a favourable value for money profile.

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**Different skin preparation alternatives to curettage**

**Hanan Osman-Ponchet**
Sophia-Antipolis, France

Curettage is widely used to enhance penetration of photosensitizing agents prior to PDT. Different skin preparation alternatives to curettage suitable for large skin areas are emerging, such as skin preparation pad abrasion or microneedling. The objective of this work was to compare the effect of different skin preparation alternatives on dermal absorption of [14C]-methyl aminolevulinate (MAL) contained in Metvix® cream using an ex vivo human skin model.

Ex vivo human skin samples were pretreated with skin preparation pad, microneedling device or tape stripping and then treated with Metvixia® cream for 2.5 hours. Dermal absorption of [14C]-MAL was measured by liquid scintillation counting. Skin integrity was evaluated by measuring transepidermal water loss (TEWL), a good indicator of stratum corneum barrier function, and by microscopic examination of skin sections.

Preparation of the skin using different alternatives to curettage markedly increases both TEWL (2- to 3 fold increase) and dermal absorption of MAL (4- to 100-fold increase) with limited apparent damage of epidermis.

**Key Words:** TEWL, PDT, MAL, Skin preparation
There is an alarming increase in drug resistance amongst bacteria and other pathogens. Antimicrobial PDT (aPDT) represents an alternative treatment for infections. No reports of microbes becoming resistant to aPDT have been reported so far. In addition, some studies show the possibility of combining aPDT with conventional antibiotics exerting a synergistic antimicrobial effect.

Basic research proves that aPDT effectively photoinactivate bacteria, in planktonic and biofilms, all kind of fungi and yeast, virus and parasites. From a clinical point of view, even though aPDT does not have any approved indication yet, several studies support its use in onychomycosis and other local superficial mycosis, infected chronic ulcers, oral infections, supplicative hidradenitis, or leishmaniasis, among others.

This presentation will provide an update about the most remarkable basic and clinical studies which support the use of aPDT in the clinical setting and, which is more important, supports the research in this strategy to fight against infections.

DL-PDT has been considered an alternative to conventional PDT for a few years. There are published several studies and reviews that indicate that DL-PDT is a treatment with efficacy and safety results similar to conventional PDT. In addition, patient satisfaction has been significantly improved, since it is less painful, reducing the time required and health resources. In this way it has been consolidated in the treatment of AK grade I and II of the face and scalp. However, Daylight PDT procedure has the limitation of weather conditions, since it cannot be done on rainy or foggy days, or on days of low temperatures or extreme heat. In our clinical practice we have solved this problem by reprogramming the day of lighting or by having the patient perform Daylight PDT at home following some instructions. In this way we want to show our clinical experience, patient satisfaction and efficiency of homebased DL-PDT in Spain.
**Background**: Daylight mediated PDT (DL-PDT) has shown to be similar to conventional PDT with regard to safety and efficacy in AK treatment. Recent developments focused on painless devices that ensure standardized and supervised procedure. The “medisun daylight 9000 PC booth” provides a daylight-adjusted spectrum for PDT with a shortened treatment procedure. Irradiation time in the setting is only 1 hour.

**Objectives**: To determine safety, treatment efficacy and pain during PDT using the medisun booth.

**Material & Methods**: We performed PDT using the medisun booth in 10 patients. Severity of AK disease was assessed by calculating AKASI. Pain during treatment was assessed by use of a VAS. MAL was applied for 1 h prior to irradiation. Patients were then irradiated for 1 h. Follow-up visits for treatment outcome were performed 3 months after.

**Results**: PDT was almost painless (VAS 1,18). All patients showed improvement of AK disease severity after 3 months (AKASI V0: 5.06, AKASI V1: 1.9, Δ AKASI V0/AKASI V1: 62.45%).

**Conclusions**: The medisun booth offers a feasible office-based treatment option to conduct PDT with a daylight adjusted irradiation spectrum. PDT was almost painless.

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The main side effects of photodynamic therapy are pain during illumination and erythema and crusting after treatment.

The introduction of daylight photodynamic therapy has resulted in pain-free field treatment of multiple actinic keratoses. Erythema and crusting may be less pronounced after daylight PDT compared to conventional PDT. The downtime associated with erythema and crusting can make patients reluctant to receive PDT.

We have introduced the concept of pulse-PDT in which MAL is applied for only 30 minutes under occlusion and then removed. Illumination with red LED light is performed after 3 h. Pulse-PDT reduced erythema after PDT of multiple AK on the face and scalp. The use of a super-potent corticosteroid before and just after pulse-PDT further reduced erythema. Pulse-PDT with or without corticosteroid induced less PpIX fluorescence than conventional PDT but no difference was found between treatment efficacies.

The use of topical potent vasoconstrictor brimonidine tartrate is another possible way to reduce PDT induced erythema.
TREATMENT OF SUPERFICIAL BCC WITH FRACTIONATED 5-AMINOLEVULINIC ACID PDT VERSUS TWO STAGE METHOLOMINOLEVULINATE PDT: A MULTI-CENTER RANDOMIZED CONTROLLED TRIAL

JANNEKE KESSELS
Maastricht, The Netherlands

H. Kreukels, PJ Nelemans, H van Pelt, K Mosterd, ERM de Haas, NWJ Kelleners-Smeets

Background: BCC is the most common type of skin cancer with growing incidence rates. 5-Aminolevulinic acid (ALA) and its methyl-ester (MAL) are currently used to treat sBCC with PDT. Previous research showed high efficacy of ALA-PDT using a 2-fold fractionated illumination scheme in which two light fractions of 20 and 80 J/cm2 are delivered, four and six hours after ALA application.

Methods: A randomized multi-centre trial in the Netherlands, to evaluate whether 2-fold ALA-PDT is superior to conventional MAL-PDT.

Results: 162 patients were randomized to either one of the study groups. After 12-months 6 treatment failures occurred after ALA-PDT and 13 after MAL-PDT. The 12-months cumulative probability of remaining-free-from-treatment-failure was 92.3% [95% CI [83.7-96.5]] and 83.4 [95% CI [73.1-90.0]], respectively (p=0.091).

Conclusions: The 2-fold ALA-PDT scheme resulted in fewer recurrences, although the difference was not statistically significant. It resulted in higher pain scores and more post-treatment side-effects compared to MAL-PDT.

Efficacy of PDT in Bowen’s disease: a retrospective observational study in 423 lesions

OSCAR ZAAR
Göteborg, Sweden


Background: Only a handful of studies have been carried out on the effectiveness of photodynamic therapy (PDT) for Bowen’s disease (BD).

Method: In this retrospective study, all patients diagnosed with BD that were treated with PDT between January 1, 2002 and December 31, 2014 at Sahlgrenska University Hospital were assessed.

Results: 423 BD lesions were included in the study. The mean FU duration was 11.2 months [range 0.2-151 months]. The complete response rate at the first FU visit was 77.5% for all BD lesions. During later FU visits, another 60 recurrences were observed, which resulted in a recurrence rate of 18.3%. Thus, the overall clearance rate after FU was 63.4% for all BD lesions. Significant risk factors for unsuccessful treatment in the present study were large lesion size (>2cm) and a single PDT session.

Conclusion: This study shows that PDT is a relatively effective treatment modality for BD.

Key Words: PDT, 5-aminolevulinic acid (5-ALA), MAL, sBCC, Effectiveness

Key Words: Bowens’s disease, PDT, SCC in situ
Recently the introduction of daylight-activated photodynamic therapy (DL-PDT) and assisted-drug-delivery (Power-PDT) has advanced the concept of PDT. Over the past few years we have gained clinical experience with these techniques and have continuously modified our [DL-] PDT treatment algorithm: Depending on the extend of field cancerization, therapy-naive patients will initially be treated with conventional DL-PDT (multiple AKs) or Lesion Intensified Field Treatment (LIFT-) PDT (few AKs). Patients previously treated with DL-PDT that would tolerate a more intense reaction can be subjected to Power-DL-PDT. Lesions reluctant to PDT are excised for histologic evaluation. 5FU-pretreatment can visualize subclinical lesions and enhance PDT efficacy. Photorejuvenation is preferentially performed with Power-DL-PDT. For Power-PDT, lasers (CO2 or Er:YAG) are preferred over medical needling. In general, warm and sunny weather conditions are preferred, as we feel that this increases the clinical reaction and improves therapy outcome. Post-treatment erythema can be managed with brimonidine tartrate gel.
PDT with methyl aminolevulinate (MAL) may prevent first onset of AK in organ transplant recipients, who are at high risk of AK and NMSC development.

Prophylactic conventional PDT for primary AK prevention was assessed in renal transplant recipients (RTR, n=25) with normal skin randomized to split-side MAL-PDT of the face, arm and dorsal hand, the contralateral side serving as an untreated control. Patients received PDT every 6 months for 5 years and had final followed up 1 year post-treatment.

Twenty RTRs were followed up for 6 years. In this period, 14 patients developed 76 AK in untreated skin and 21 AKs in PDT-treated skin. The median time to first onset of AKs was 30 months in untreated skin and 42 months in PDT-treated skin.

PDT was generally well tolerated, although erythema, edema and scaling occurred in most patients following the first 1-3 treatments.

Daylight PDT (DLPDT) is a simplified PDT procedure in which daylight is used for the photosensitizer activation. Based on this concept the treatment is less expensive, less time-consuming, less painful and better tolerated by the patients. Recent trials have demonstrated that DLPDT achieves similar short-term response rates with conventional PDT (CPDT) in the treatment of nonhyperkeratotic AKs. Data, however, on long-term efficacy of DLPDT are still limited. The presentation will focus on results of a multicenter intra-individual study with the objective to evaluate long-term efficacy of DLPDT and compare it with that of CPDT. A total of 46 patients with 453 lesions completed the study. Clinical evaluation at the 12-month follow-up demonstrated complete lesion response of 71% for DLPDT and 73% for CPDT, which was not a statistically significant difference. According to the results of the study both treatments are similar in terms of long-term efficacy and recurrence rates. Being effective and better tolerated DLPDT may address some of the unmet needs in the treatment of AKs, especially in large areas.
Background: Fortaleza is a northern city in Brazil with a low latitude (3º 43’ 2”S). In this part of the country, there are many individuals with oculocutaneous albinism (OCA) and actinic keratosis (AK) forming field cancerization.

Methods: Twenty-three patients with OCA and AK underwent two sessions of standard daylight photodynamic therapy (DL-PDT) with curettage, a month interval between them. A skin biopsy was carried out one week before the first treatment and ninety days after the second one, to study later histopathological and immunohistochemical parameters.

Results: The AK clearance rate was 51% after 1 session (T1) and 68% after 2 sessions (T2) four months after the first treatment (T1 and T2, p < .0003 – Conover test).

Conclusion: DL-PDT presented a clinical efficacy lower than the population without OCA. A second session improved the clinical results. Histopathological and immunohistochemical parameters data analysis in process can explain better these results.

Key Words: AK, Curettage, Daylight, Field cancerization, Oculocutaneous albinism, Phototherapy

Porphyrsins based on the PPIX motif are used in many important systems such as pharmaceuticals and in photosynthesis. The synthesis of drugs with suitable solubility remains a key challenge in drug applications. Polyamine adducts allow a drug to specifically target cell structures in vitro.1,2,3 In this research we have synthesised hybrid polyamine porphyrins such as in Figure 1 to aid mitochondrial targeting and water-solubility. The compounds localise in HEP3B and HT29 cancer cells and the porphyrin with the longer amine chain localises mainly in mitochondria.3 The in vitro PDT efficacy as well as singlet oxygen quantum yields, after laser 660 nm irradiation, are strong whereas exogenous PPIX itself exhibits much weaker PDT effects. In vivo mice studies of the compounds are currently underway.

The Immunology Frontier Research Center at Osaka University is an institute with international researchers and publications in world-leading journals. We promote a positive work environment and cutting-edge biological research.

Key Words: Mitochondrial, Polyamine, PPIX, Cancer, Singlet oxygen
Leishmaniasis of the ear treated successfully by PDT

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Sara Elloudi, Selma Benkirane, Zakia Douhi, Salim Gallouj, Fatima Zahra Mernissi

Introduction: Cutaneous leishmaniasis (CL) is a parasitic infection characterized by significant clinical polymorphism. Unusual clinical aspects, sometimes on in the immunodeficient patient or associated with particular parasitic species. We report a particular aspect of cutaneous leishmaniasis of the ear in a patient under anti-TNFα treated by the Photodynamic therapy (PDT) successfully.

Observation: Patient aged 42, followed for hemorrhagic rectocolitis (HCR) for 4 years treated by Infliximab and Azathioprine, present since one and a half years of a puriginous and slightly painful crustal lesion of centrifugal evolution in the right ear. The first cutaneous biopsy was in favor of pyoderma gangrenosum. The patient was on oral and injectable corticosteroids, antibiotics and local care with no improvement. The evolution was marked by the installation of a peri-choondritis and the appearance of new plaques and nodules ulcerated in the face and neck. Dermoscopic examination revealed tears, star-white appearance, red areas, polymorphous vascularization, scales, skulls and ulcerations in all lesions suggestive of leishmaniasis. This diagnosis was confirmed by histologically. The patient was on intramuscular Glucantime for 1 month, Chlortetracycline 3% ointment and Gentamycin 0.5% ointment with partial response. Because of the persistence of stigmas of infection and the push of HCR, the treatment by PDT was indicated with good evolution. Indeed, there was complete regression of the lesions clinically and dermatologically with a satisfactory aesthetic result.

Discussion: Leishmaniasis are zoonoses caused by parasites of the genus Leishmania. They represent a group of diseases that occur on the surface of the globe, and are very common in Morocco. Depending on the causal species and the immune response of the host, there are different clinical forms: visceral, cutaneous and mucocutaneous. The diagnosis must be evoked in case of persistent skin lesions, ulcerated or nodular, an endemic area. It is a microscopic or molecular examination of a sample of the lesion obtained by scraping or biopsy. Dermoscopy currently facilitates diagnosis. Experimental studies have shown that anti-TNFα can promote the occurrence of leishmaniasis which illustrates our case. The therapeutic approach depends on the species of leishmania and the clinical presentation, it has appealed in our context to intramuscular Glucantim, with Chlortetracycline ointment 3% and gentamycin 0.5% ointment, as well as dynamic phototherapy with good evolution.

Conclusion: In case of chronic ulceration on a regional discovery, resistant to non-specific treatments, cutaneous leishmaniasis should be sought. The dermoscopic examination is a step that comforts the diagnosis and evaluates the therapeutic efficacy, especially in particular contexts as was the case of our patient. Intramuscular glucantivity combined with PDT is a good therapeutic alternative for multi-lesional leishmaniasis, with peri-orificial and resistant localization. A satisfactory aesthetic result was mentioned.

Key Words: Leishmaniasis, Ear, PDT

ALA-PDT as an alternative therapeutic option in some dermatological diseases and imperfections: our experience

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Background: PDT is one of the most innovative and technologically advanced dermatological therapies currently available. We report our experience using photodynamics with methylaminolevulinate or 5-ALA 10% as photosensitizers for treatment of dermatological diseases such as alopecia areata of the scalp and vitiligo of the body.

Patient and methods: 16 patients with severe alopecia areata were treated every three weeks. The outcome was evaluated at 6 and 12 months. Clinical, dermoscopic and confocal microscopy pictures were performed at T0, after 3 months (T1), and after 12 months (T2). The distance between sessions was 21 days and after application the metvix kep tinocclusion for 3 hours. 10 patients with vitiligo were treated with needling on a part of the body, followed by 5% A LA , kep tinocclusive for 2 hours. Clinical and dermoscopic pictures were performed at T0 and after 2 months. Each patient underwent 3 treatments spaced each of three weeks.

Results: For alopecia areata 10% of the patients showed a partial re-growth of the hair, in 20% a total regrowth of the hair. For vitiligo 40% of patient obtained a total repigmentation of the lesions treated, 20% a par-tial repigmentation.

Conclusions: PDT shown to be a valid alternative to classic therapies to treat alopecia areata and vitiligo.
Topical PDT, recognized as an effective way to manage actinic fields of cance- 
risation is also now acknowledged to be a safe and efficient option to rejuvenate 
and remodel UV-damaged skin. Substantial data from the literature (in vitro, on 
animal, on human immunocompromised or immunocompetent), have led experts 
write recommendations which state that photodynamic photorejuvenation (PR-
PDT) has grade B efficacy with a proof level I. Clinical studies showed that tone, 
 lentigos, skin roughness, texture and fine wrinkles improved. More recently 
paraclinical studies with histology, immuno-histo-chemical evaluations have 
confirmed a clear remodeling effect in the dermis.

Since the first publication of the interest of Intense Pulsed Light -PDT (IPL-PDT) 
versus IPL alone sessions by Ruiz Rodriguez in 2002, different protocols have 
been developed. The illumination is traditionally of low intensity and prolonged 
duration, allowing the photochemical reactions themselves to occur, as with 
continuous wave lamps, light emitting diodes (LEDs) of different colors (notably 
blue or red) or natural daylight. But undeniably positive clinical results have also 
been obtained with IPLs and pulsed dye laser with high intensity and brief milli-
second pulse durations.

New emergent protocols for facial and extra-facial rejuvenation will be described:
- Daylight PR-PDT
- Intensified PR-PDT : Ablative fractional laser CO2 or Er:YAG, microneedling or 
sand-paper abrasion
- Combined modalities
  - Intensified-daylight PR-PDT
  - Intensified-IPL PR-PDT plus or less LED or daylight
  - Non ablative fractional laser and blue light 
  (plus temperature room elevation

Though favorable results are not lacking, many problems remain to be resolved 
in daily practice: optimal protocol type ? number and frequency of sessions necessary 
to maintain the results that often disappear after a few months or years ?...
Off-label use is the use of pharmaceutical drugs for an unapproved indication or in an unapproved patient population. Off-label use is legal unless it violates ethical guidelines or safety regulations.

PDT enhances dermal remodeling and resolves chronic inflammation, and PDT has been used for numerous off-label indications, amongst those haemangiomas, vascular malformations, psoriasis, acne vulgaris, verruca vulgaris, rosacea, hidradenitis suppurativa. Aminolevulinic acid (ALA) and the methyl ester of aminolevulinic acid (MAL) are the most used topical photosensitizers in off-label PDT but also dyes as rose bengal, acridine orange, eosin are being used in clinical settings.

ALA and MAL PDT is a safe and effective modality for off-label treatment of many dermatological conditions. With the introduction of daylight PDT the treatment is practically painfree, downtime is minimal and the technique is suitable for patients of all ages and lifestyles.

Key Words: Off-label indications, Alternative use, PDT
Efficacy assessment of combination of microneedling and DL-PDT for AK

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Fortaleza, Brazil

Renata Tomaz

Background: DL-PDT with methaminolevulinate cream (MAL) is approved for the treatment of facial actinic keratosis (AK) with clearance rates from 65-88.5%. Skin preparation techniques such as microneedling (MN) have been used for a greater efficacy.

Methods: Ten patients with multiple AK grade I-II were randomized to receive the standard protocol with curettage of DL-PDT on one side of the face and DL-PDT combined with 0.5-mm-length MN on the other side. After 30 days, a second session of DL-PDT was repeated on the side that was performed the standard protocol.

Results: At day 30, the average AK clearance was 64.36%, without difference between the two sides (p= .853)- Mann-Whitney test. A second session of standard DL-PDT did not increase the clinical results (p= .0921)- Friedman test.

Conclusion: MN-assisted DL-PDT was a safe and effective method, but without superior clinical results than one session of standard DL-PDT protocol.

Key Words: AK, Curettage, Daylight, Microneedling, MAL, PDT

Indoor Daylight-like PDT using low-level laser therapy (LLLT) head devices. The “Cap-PDT” study

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Introduction: DL-PDT is an increasing cost-effective and non-painful treatment for actinic keratoses (AK), although it needs time and specific weather conditions to perform. In this study we intended to analyze the effectiveness of low-level laser therapy (LLLT) devices as light sources for PDT.

Material and Methods: We performed an experimental study with 27 patients (with AK-I, II) that underwent one 15-minute session of PDT with LLLT cap-like devices after photosensitizer application. The main variable was AK count. We also measured AK quality of life index (AKqOL). AKs were mapped in the patients’ scalps for 2-month follow-up. In 5 patients pre-post biopsies in exact scalp positions were performed for study. Wilcoxon statistical analysis was used for comparison.

Results: All patients experienced a global reduction of AKs (p< 0.0001), AKqOL (p=0.034), and a normalization of skin biopsy in the selected individuals.

Conclusion: LLLT-PDT can be an effective modality for PDT.

Key Words: AK, Atypia, Biophotomodulation, Low-level laser therapy, MAL, PDT
Background: Liquid-based cytology (LBC) is fast, easy and inexpensive in use and may prove beneficial as a diagnostic method of non-melanoma skin cancer ahead of non-invasive treatment methods.

Aims: To evaluate the quality of LBC test as a diagnostic tool for basal cell carcinoma (BCC) and actinic keratosis (AK).

Methods: Patients with primary, histologically verified BCC and AK for PDT were recruited. After initial light curettage a Medscand® Cytobrush was used to collect cells from the tumors. Cytodiagnostic results were compared with the diagnosis in the histopathology report (the gold standard).

Results: A total of 24 lesions (12 BCC, 12 AK), so far, were included. Sensitivity and specificity of LCB for diagnosis of BCC and AK was 67%, 97% and 58%, 83%, respectively.

Conclusion: The results suggest that LBC using ThinPrep®Pap test and Medscand®Cytobrush following curettage has a too low sensitivity for routine diagnostic use in BCC and AK.

Key Words: Cytology, Diagnostics, BCC, AK, Non-invasive treatment
Alopecia is an autoimmune disease that alters one's appearance. Some define it as a cosmetic disease despite evidence that substantial psychosocial burden is associated with it. Managing alopecia is a difficult challenge that requires long-term treatment with a number of topical and systemic agents, which often result in suboptimal results. AIMS: We aim to compare the combined treatment of skin needling and 5-ALA-PDT with that using 5-ALA-PDT alone in the treatment of alopecia in order to evaluate the use of microneedles as a means to enhance the drug’s transdermal penetration and its effectiveness.

Methods: 10 patients received skin needling and 5-ALA-PDT every 3 weeks and 10 patients only 5% 5-ALA for 10 sessions. Outcome was evaluated for 12 months. Clinical, dermoscopic and confocal microscopy pictures performed at T0, after 6 sessions (T1) and after 10 sessions (T2).

Patients treated with needling + PDT underwent 10% 5ALA topic application followed by needling.

In group treated with combined therapy, 10% 5ALA occlusive dressing held 2 hours went before PDT application. Needling enhance 10% 5-ALA skin penetration.

Results: Patients received only needling showed a partial improvement in 20% of cases. Patients received combined therapy showed total repigmentation in 40% of cases.

Conclusions: Our study suggests the potential use of combining skin needling with ALA-PDT to achieve better results in vitiligo treatment compared to skin needling alone.

Skin needling to enhance ALA 5% penetration in the treatment of Vitiligo

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Vitiligo is a common autoimmune hypomelanotic disorder with a considerable psychological impact on the patient quality of life. Managing vitiligo is a difficult challenge that requires long-term treatment with a number of topical and systemic agents, which often result in suboptimal results. AIMS: We aim to compare the combined treatment of skin needling and ALA-PDT with that using skin needling alone in the treatment of vitiligo in order to evaluate the use of microneedles as a means to enhance the drug’s transdermal penetration and its effectiveness.

Methods: 5 patients were treated every 3 weeks with combined skin needling and ALA 5% -PDT on one side of the body and 5 patients were treated with needling alone on one side of the body for a total of 3 treatments for each one. Outcome was evaluated for two months. We obtained clinical and dermoscopic pictures at T0 and after 9 weeks.

Patients treated with needling + PDT underwent 10% 5ALA topic application followed by needling.

In group treated with combined therapy, 10% 5ALA occlusive dressing held 2 hours went before PDT application. Needling enhance 10% 5-ALA skin penetration.

Results: Patients received only needling showed a partial improvement in 20% of cases. Patients received combined therapy showed total repigmentation in 40% of cases.

Conclusions: Our study suggests the potential use of combining skin needling with ALA-PDT to achieve better results in vitiligo treatment compared to skin needling alone.

Skin needling to enhance 5-ALA 10% penetration in the treatment of Alopecia Areata

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Alopecia is an autoimmune disease that alters one's appearance. Some define it as a cosmetic disease despite evidence that substantial psychosocial burden is associated with it. Managing alopecia is a difficult challenge that requires long-term treatment with a number of topical and systemic agents, which often result in suboptimal results. Often and willingly some patients are eager to try unconventional therapies, despite the very limited research evaluating their safety and efficacy. We aim to compare the combined treatment of skin needling and 5-ALA-PDT with that using 5-ALA-PDT alone in the treatment of alopecia in order to evaluate the use of microneedles as a means to enhance the drug’s transdermal penetration and its effectiveness.

Methods: 10 patients received skin needling and 5-ALA -PDT every 3 weeks and 10 patients only 10% 5-ALA for 10 sessions. Outcome was evaluated for 12 months. Clinical, dermoscopic and confocal microscopy pictures performed at T0, after 6 sessions (T1) and after 10 sessions (T2).

Patients treated with needling + PDT underwent 10% 5ALA topic application followed by needling.

In group treated with combined therapy, 10% 5ALA occlusive dressing held 2 hours went before PDT application. Needling enhance 10% 5-ALA skin penetration.

Results: Patients received only needling showed a partial improvement in 20% of cases. Patients received combined therapy showed total regrow in 40% of cases.

Conclusions: Our study suggests the potential use of combining skin puncture with 5-ALA-PDT to achieve better results in the treatment of alopecia compared to 5-ALA-PDT alone.
Study of the treatment of AK and cutaneous field of cancerization with DL-PDT: clinical, histological and confocal microscopy evaluation

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AK are the most common pre-malignant lesions of the skin. Some authors even characterize AK as in situ squamous cell carcinoma (SCC). Although AKs could have a spontaneous regression, some have a tendency of progressive thickening evolving in up to 0.025%-20% per year to SCC. In general, AKs are located in photodamaged areas and make part of an ongoing field of disease known as field of cancerization.

DL-PDT is a well established therapy option for treating AKs in the scalp and the face, it is also safe and effective for the treatment of fields of cancerization. The goal of this ongoing study is to evaluate the efficacy of this treatment comparing clinical, histopathological and confocal images, before and after DL-PDT.

Twenty-five patients from the Dermatology outpatient clinic of University of São Paulo enroll this study. Both sex patients with photodamaged skin with 6 or more AKs in the face were the inclusion criteria. CM study and Digital photographs of field of cancerization should be taken before treatment, in the day of the DL-PDT and after 3 months of treatment. The most photodamaged area should be photographed and biopsied by a 2 mm punch. Clinical reassessment should be done after 1 month. Three months after the DL-PDT the area will be evaluated with CM and the second biopsy performed at the same area 0.5 cm away from the previous place.

There are no studies in Brasil neither making a reliable clinical-confocal correlation nor histopathological comparison with CM. Therefore, we understand the importance of the HP and CM study of AKs and field of cancerization before and after DL-PDT.

Successful treatment of recurrent nodular BCC with MAL-PDT

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Background: Topical PDT is an effective therapeutic modality for AK and certain types of non-melanoma skin cancers, with excellent safety and cosmetic outcomes. There is limited data on the efficacy of PDT for recurrent basal cell carcinoma (BCC).

Case Report: A 54-year-old Caucasian man who had a past history of nodular BCC on his nose that was surgically excised 3 years ago presented with a new red patch on his nose at exactly the same site, which he had noted in the past 2 months. A punch biopsy confirmed the diagnosis of nodular BCC. He was treated with two sessions of methyl aminolevulinate-PDT (MAL-PDT) using 630nm red light irradiation one week apart. There was complete resolution with excellent cosmesis at 3 months, and clearance was sustained at 12 months post-treatment.

MAL-PDT may be considered for recurrent nodular BCCs, particularly in exposed anatomic sites where cosmetic outcome is a key consideration.

Key Words: AK, Confocal microscopy, DL-PDT

Key Words: PDT, Nodular BCC, MAL, Recurrent
Introduction: Bowen Disease (BD) is a carcinoma in situ, and its vulvar location is a therapeutic challenge. Dynamic phototherapy (PDT) is an interesting therapeutic strategy thanks in particular to the original properties of tumor selectivity.

We report the cases of two patients effectively treated with PDT and Imiquimod 5% as a therapeutic adjunct for vulvar (MB).

Observation:
Case 1: Patient 57 years old, diabetic and hypertensive, who had a pruritus vulva evolving since 1 year. The dermatological examination had objectified a whitish coating, not decolable, sitting at the level of the small lip. The dermoscopy showed in both patients a homogeneous glomerular vascularization in favor of a Bowen disease, confirmed by the histological examination. The patients had benefited from a conservative treatment with 2 sessions of PDT with as photosensitizer the methylaminolevulinate (Metvixia) at a rate of 100 J/cm² at one week intervals. The suites were simple. An addition by Imiquimod 5% for 3 months was introduced.

Case 2: A 47-year-old patient with no notable pathological history who had vulvar pruritus with a history of 1 year. The dermatological examination showed a plate at the level of the large lip, 6 cm, erythematosus well limited, regular edges surmounted by a whitish coating, non-peelable, taking almost the entire plate.

After 3 months of treatment, the histological control, performed in the 2 patients had not objectified tumor cells. The decline is 2 years in the first patient and 6 months in the second.

Discussion: Bowen Disease (BD) or vulvar carcinoma in situ usually manifests as a single, proliferating, leukoplasic or erythroplasic plaque that extends centrifugally very progressively without central healing. There are several therapeutic modalities, surgical, local, and non-surgical ablative. The therapeutic decision takes into account the size and number of lesions, and the age of the patient, but also the experience of the practitioner and the choice of the patient as well as his immune status. Although it has the advantage of histological control, surgery at the vulvar level can be debilitating and mutilating with severe consequences. Dynamic phototherapy (PDT) is increasingly used to treat superficial cancers of the skin. It acts through a photosensitizer that triggers a phototoxic reaction that produces singlet oxygen and other free radicals with cytotoxic and vasculotoxic effects leading to necrosis and cell apoptosis.

We present a 48-year-old woman with an one year history of histologically confirmed Paget Disease located on the anogenital skin. After having excluded associated malignancy and as wide local excision could lead to anogenital mutilation and functional impairment we decided to proceed with the combination of PDT and imiquimod cream 5%. Our patient was treated with 3 PDT sessions, performed 15 days apart, followed by three times per week application of imiquimod 5% cream for 6 consecutive weeks. Complete clinical and histological cure was achieved 3 months after treatment. The patient remained free of recurrences at the 6- and 12-month follow-up. Close monitoring for recurrences is scheduled. As use of PDT for extramammary Paget disease has up to now achieved only palliative results combined use of PDT and imiquimod could be an attractive alternative that deserves further investigation.

Conclusion:

We present a 48-year-old woman with an one year history of histologically confirmed Paget Disease located on the anogenital skin. After having excluded associated malignancy and as wide local excision could lead to anogenital mutilation and functional impairment we decided to proceed with the combination of PDT and imiquimod cream 5%. Our patient was treated with 3 PDT sessions, performed 15 days apart, followed by three times per week application of imiquimod 5% cream for 6 consecutive weeks. Complete clinical and histological cure was achieved 3 months after treatment. The patient remained free of recurrences at the 6- and 12-month follow-up. Close monitoring for recurrences is scheduled. As use of PDT for extramammary Paget disease has up to now achieved only palliative results combined use of PDT and imiquimod could be an attractive alternative that deserves further investigation.

Key Words: Bowen vulvar disease, PDT, Imiquimod.
Background: A notable downside of photodynamic therapy (PDT) is the amount of pain that accompany the treatment.

Methods: In this prospective randomized study, patients were treated using a ALA 78 mg/g gel for symmetrically distributed actinic keratosis. One side was illuminated with the Aktlite® CL-128 lamp and the other side with the RhodoLED® lamp in which the light intensity gradually increased to a maximum of 60%. Both sides received a total light dose of 37 J/cm². Pain during the treatment was measured using a visual analogue scale. The clinical effectiveness of the two treated sides was assessed after 12 weeks.

Results: Illumination with the gradually increasing light intensity resulted in a decrease of the median VAS score by 1.1 points. Clearance rate were similar between the two lamps.

Conclusion: Minimising the light intensity during the illumination phase of PDT reduces pain, while still preserving a high clearance rate of AKs.

Pain relief during PDT for AK with a new irradiation protocol
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5-aminolaevulinic acid nanoemulsion (BF-200 ALA) is more effective than MAL in the DL-PDT of AK: A prospective, randomized, non-sponsored, multicenter split-face study of 69 patients and 767 treated AK with 12-month follow-up
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Key Words:
AK, BF-200 ALA, DL-PDT, MAL, Multicenter, Split-face
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