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LABORATOIRE DERMATOLOGIQUE

SKIN-CARE AND COSMETICS PRODUCTS IN THE DAILY PREVENTION, TREATMENT AND SUPPORTIVE CARE OF CUTANEAOUS TOXICITY IN ONCOLOGY PATIENTS

WHY IS IT SO IMPORTANT TO MANAGE CUTANEOUS SIDE-EFFECTS IN ONCOLOGY PATIENTS ?

Numerous patients who receive targeted chemotherapy for cancer suffer from cutaneous toxicity. These disabling skin reactions are a significant problem for an increasing number of patients and their treating physicians.
Particularly, as using inappropriate personal hygiene products often worsens these otherwise manageable side-effects.
Although ample information is available in the literature about pharmaceutical treatment for cutaneous toxicity, little is available for the concomitant use of dermatological skin-care products with medical treatments.
This brochure includes several recent scientific posters that provide information about the management by skin-care and cosmetics products of cutaneous toxicities associated with targeted chemotherapy such as epidermal growth factor receptor inhibitors and other monoclonal antibodies.

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GUIDANCE FROM THE ESKIMO GROUP RECOMMENDATIONS: AN ALGORITHM FOR DERMOCOSMETIC USE IN THE MANAGEMENT OF CUTANEOUS SIDE EFFECTS ASSOCIATED WITH TARGETED THERAPY IN ONCOLOGY

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INTRODUCTION

Cutanenous toxicity with targeted chemotherapeutic agents is common. With improved survival rates, reduced systemic toxicity and increasing indications, this is becoming a substantial problem for patients. Designed to target specific molecular tumour growth factors, these agents also target growth factors in the skin and its appendages. The exact mechanisms for the development of these symptoms are only partly understood. However the molecular, histological and clinical osbservations suggest that targeted chemotherapies ultimately disturb skin barrier function. Clinical symptoms (Table 1) include disruption of the pilosebaceous follicles causing folliculitis, alteration of the skin barrier causing xerosis, cracked skin and pruritus. Other reactions include: hand and foot erythema, increased sensitivity to ultraviolet radiation, hyperpigmentation, and altered phaneres with paronychia. In addition to disturbed epidermal barrier function, the skin is more sensitive to allergens and susceptible to infection. Using inappropriate personal hygiene products often worsens these effects while lesion camouflage may improve patient well-being. Little information is currently available in the literature for the adjunctive use of dermatological skin care in the pharmaceutical management of these reactions.

Table 1: Symptoms of cutaneous toxicity

Symptom	Dysfunction	Onset
Folliculitis (skin rash)	Disruption of the pilosebaceous follicle	Treatment week 1
Xerosis, cracked skin and pruritus	Alteration of the skin barrier	After rash
Paronychia	Alteration of phaneres	Treatment month 2-4
Hand and Foot Syndrome	Alteration of the skin barrier	Treatment week 2 or 3

The objective of this treatment algorithm is to provide guidance for the appropriate use of dermatological cosmetics to help improve the management of cutaneous skin reactions following targeted chemotherapy.

MATERIAL AND METHODS

The ESKIMO group is comprised of six European dermatologists and one oncologist. The group performed an extensive literature review followed by a consensus meeting to discuss the different cutaneous toxicities related to targeted chemotherapy as well as to quality of life. The specialists discussed the appropriate use of dermatological cosmetics for the different cutaneous skin reactions according to the available literature. The group's recommendations were completed with current practices and personal experience.

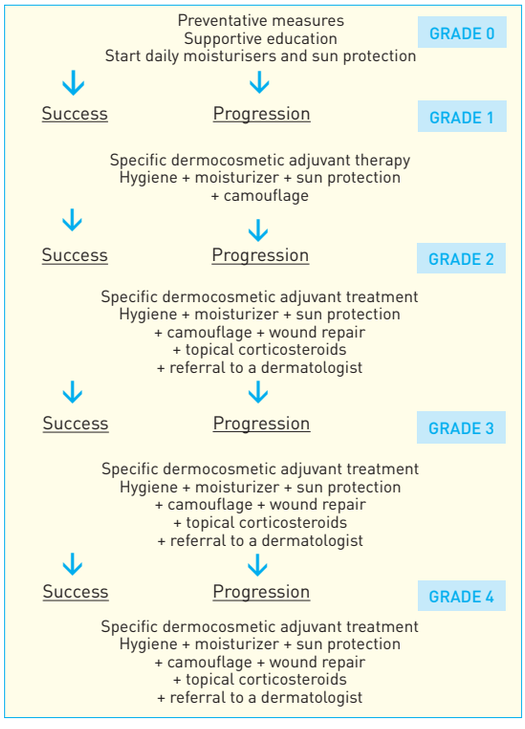
RESULTS

Dermatological skin care was defined as cleansing, moisturising, personal hygiene and photoprotection using products with a proven tolerance profile, tested on pathological skin. The group agreed that proactive treatment is critical as toxicity has been observed to arise as early as two days after the first treatment. There is no clear evidence which patients may be more susceptible, although older age and atopic predisposition are correlated with a higher incidence of xerosis. Proactive intervention may help to obtain a maximum benefit from EGFRI treatment and prevent dose change or interruption. Early education and continued encouragement throughout treatment have been shown to benefit quality of life. Skin cleansing, skin hydration, photoprotection, dermatologist referral and management of skin sensitivity should be considered when managing cutaneous side effects during and after targeted chemotherapy (Table 2).

Table 2: Strategies for the management of cutaneous side effects

- Skin cleansing is appropriate with syndets with a pH of 5.5.
- Apply daily a non-comedogenic moisturising cream on both the face and body, irrespective of the chemotherapeutic agent prescribed to control rash and xerosis.
- Prefer oil in water vehicles for medical treatments and emollients containing humectants such as urea 5-10% or niacinamide.
- Apply broad-spectrum sunscreen to the face and other exposed areas (i.e. neck and arms). Use of SPF 15+ / UVA-PF level according to phototype or expected photosensitivity.
- Improve well-being by covering disfiguring erythema and pallor with non-comedogenic make up. Avoid occlusive make up if folliculitis is severe.
- Avoid products containing fruit acids, anti-bacterials or benzoyl peroxide. They are irritant and may be harmful. Furthermore, they have not shown to be helpful to manage rash.
- Antiseptics and wound healing creams have shown certain advantages in managing fissures and paronychia.

Figure 1: Algorithm for the management of cutaneous toxicity



CONCLUSION

The working group considers that all symptoms including folliculitis, xerosis, fissures, as well as hand and foot syndrome are linked to skin barrier dysfunction. Maintaining skin barrier function using appropriate cosmetic products can control the severity of these symptoms. The algorithm proposes (Figure 1) a baseline treatment followed by additional suggestions depending on symptom severity.

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BARRIER PROTECTIVE SKIN CARE FOR PROPHYLAXIS OF CHEMOTHERAPY-INDUCED CUTANEOUS SYMPTOMS

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ABSTRACT

Anti-tumour chemotherapeutic agents, as is known, cause toxic antiproliferative and antidifferentiating effects especially in the skin. Depending on the agent, the dosing regimen, and individual pathological factors the barrier function starts to decompensate, which is the main cause for clinical symptoms as pruritus and irritation and consequently reduces the quality of life of the patients. Niacinamide is a hydrophilic vitamin that, given a sufficient bioavailability, has antipruritic, antimicrobial, vasoactive and barrier protective effects, depending on concentration. Niacinamide is a well-tolerated and safe substance used in cosmetics.

In a prospective multicentre study, a niacinamide-containing, barrier protective preparation has been investigated in a cross over design in comparison with standard care (over 2 x 6 weeks, application twice a day) in patients with breast cancer undergoing chemotherapy. Primary target parameter was the weekly-collected dermatology life quality index (DLQI).

The results show that the prophylactic use of the test preparation stabilizes the quality of life and can effectively prevent the development of unwanted cutaneous effects.

INTRODUCTION

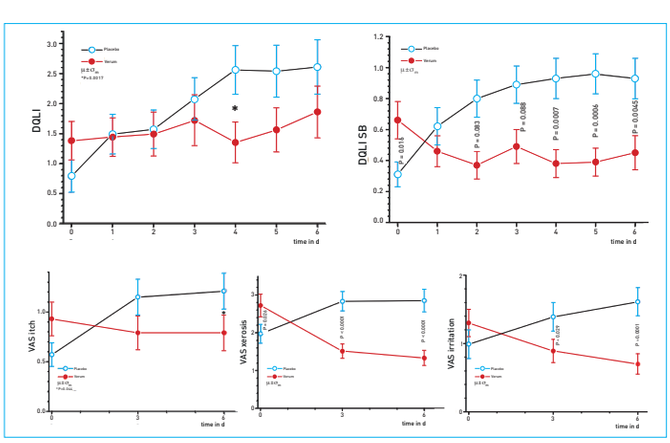
The number of new cases of cancer in Germany is about 470,000 per year with increasing tendency. Since 1980, the number of cancers diagnosed per year has been risen by 35% for women and by over 80% for men. This trend can also be observed in other industrial nations in the world. Several factors contribute to the increasing incidence: changes in the age structure of the population as well as the increasing burden of risk factors as tobacco and alcohol consumption, UV radiation and chronic infections are considered essential here. However, a significantly higher survival rate can be observed caused mainly by improvements in early diagnosis as well as by evidence based antineoplastic chemotherapies. Nearly all of antitumor pharmaceutical products used have specific or unspecific unwanted effects, often affecting the skin. Depending on the combination, doses and duration of the therapy up to 40% epidermal barrier disorders can be observed that become clinically apparent as dry, itching and finally irritated skin. This can seriously reduce the patient's quality of life. Depending on the intensity of the symptoms even discontinuation of the therapy might be required in single cases. Furthermore, depending on the pathogenetic pattern, symptom complexes dominated by inflammatory symptoms can be established, like the palmar-plantar erythrodysesthesia (hand-foot syndrome), the acne-like-rash, or phototoxic reactions. In order to maintain the patients quality of life, various strategies for supportive care are recommended. Their effectiveness has rarely been proven by clinical studies yet. Therefore, a randomized, open, controlled multicentre study has been carried out in order to prove the effectiveness of a niacinamide-containing preparation on quality of life in patients with breast cancer treated with antitumor chemotherapy.

STUDY DESIGN

- Prospective, open, randomized, controlled, crossover, multicentre (6 centres) interventional study
- DLQI (once weekly) as a standardized survey method, VAS pruritus, xerosis and irritability
- Test preparation (TP): Lipikar® Baume AP (containing 4% niacinamide)
- Standard care (SC): patients usual skin care as used before application twice daily, test preparation vs. standard care, start at the beginning of chemotherapy, crossover end of week 6, end after week 12
- Inclusion: adjuvant or neoadjuvant chemotherapy with anthracycline or taxane, accompanying antibody therapy using trastuzumab optional
- Exclusion: radiotherapy within 3 months prior to study; skin diseases with barrier disorders; use of retinoids, lipid lowering drugs (HMG-CoA-reductase inhibitors, fibrates, herbal lipid lowering drugs), and diuretics, unless it is used continuously for at least 2 weeks before study without doses changes; application of anti-inflammatory topic or systemic preparations: calcineurin inhibitors, glucocorticoids (except concomitant medication for chemotherapy), non-steroid antiphlogistics, DMARDs or herbal medicines, unless it is used continuously for at least 2 weeks bebore study without doses changes; use of vasoactive OTC drugs, i.e. antihistamines as well as OTC cold remedies containing antihistamines or phenylpropanolamine resp. phentolamine, that affects the barrier function of the skin.

RESULTS

Regarding the total DLQI, under treatment with TP it is slightly lower than under SC. Treatment showed significant influence on the DLQI after 4 weeks. However, sub-analysis of particular DLQI categories showed that the differences between TP and SC have been significantly higher in the category «symptoms and feelings», which, for this study setting, is the most decisive category. Already 2 weeks after treatment start, TP showed superiority over SC. After 6 weeks of treatment, decrease of pruritus, xerosis and irritability could be observed. *In summary it can be stated that the application of TP has considerable advantages regarding the relevant aspects of quality of life for patients with breast cancer undergoing chemotherapy.*



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A CREAM CONTAINING LIPOHYDROXY ACID AS A NEW ALTERNATIVE TREATMENT FOR CETUXIMAB-INDUCED PAPULOPUSTULAR ERUPTION

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INTRODUCTION

Cetuximab, an epidermal growth factor receptor inhibitor (EGFRI), has shown efficacy in the treatment of solid tumors. The most frequent cutaneous adverse effect of EGRFI therapy is an acneiform eruption observed in 2/3 of patients within 1 to 3 weeks after therapy initiation that may correlate with a positive response to chemotherapy. We report a case of a patient using cetuximab for metastatic colon cancer treatment who developed this skin side effect and showed a favorable response to the use of a cream containing Lipohydroxy acid (LHA), Salicylic acid (SA), Niacinamide and Piroctone Olamine.

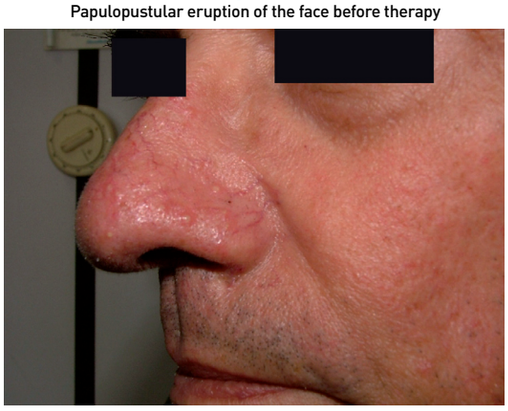
CASE REPORT

A 55-year-old man who developed metastatic colon cancer was treated with bevacizumab, irinotecan, 5-fluorouracil and leucovorin. Because he did not respond, he was started on cycles of cetuximab and irinotecan. Two weeks later he presented with a papulopustular eruption on the central area of his face (Fig. 1). A cream containing Lipohydroxy acid (LHA), Salicylic acid (SA), Niacinamide and Piroctone Olamine was added to the treatment with improvement of his eruption within one week (Fig. 2). Subsequently his malignant disease deteriorated with fatal outcome.

DISCUSSION

This cutaneous reaction is possibly caused by a direct effect of EGFR blockade, increased expression of the negative growth regulator p27, inducing apoptosis, and keratinocyte differentiation. Histopathology showed thinning of the stratum corneum, infiltration of inflammatory cells into the follicles, which were enlarged and plugged with keratin. There is no gold-standard therapy for this papulopustular eruption. Therapeutic measurements include topical and systemic antibiotics, topical corticosteroids, benzoyl peroxide, nystatin, ketoconazole, pimecrolimus, and retinoids. The formulation containing Lipohydroxy acid (LHA), Salicylic acid (SA), Niacinamide and Piroctone Olamine, may be a novel option to treat this EGFRI induced skin eruption.

Figure 1:
Papulopustular eruption of the face before therapy



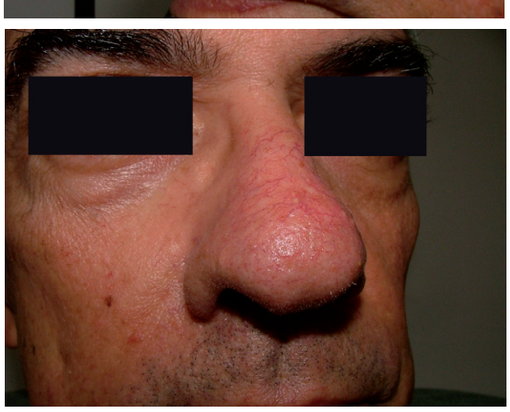
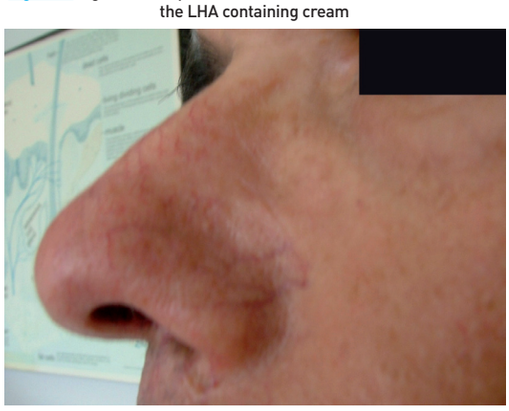
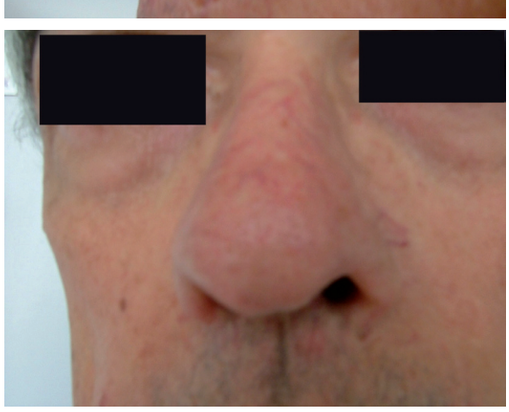


Figure 2: Significant improvement after one week of treatment with the LHA containing cream





CONCLUSION

Cetuximab induced EGRF blockade results in enlarged and inflamed follicles plugged with keratin, and thinned epidermis. The proposed mechanism is increased p27 expression that leads to apoptosis and keratinocyte differentiation. LHA, due to its lipophilic properties, disrupts the keratinosomes and allows for a targeted cell by cell exfoliation of keratinocytes, that helps to unplug the follicle. A cream containing Lipohydroxy acid (LHA), Salicylic acid (SA), Niacinamide and Piroctone Olamine, may also aid in treating this EGRFI acne-like eruption.

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EVALUATION OF QUALITY OF LIFE AFTER A MEDICAL CORRECTIVE MAKE-UP LESSON IN PATIENTS WITH VARIOUS DERMATOSES

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INTRODUCTION AND OBJECTIVES

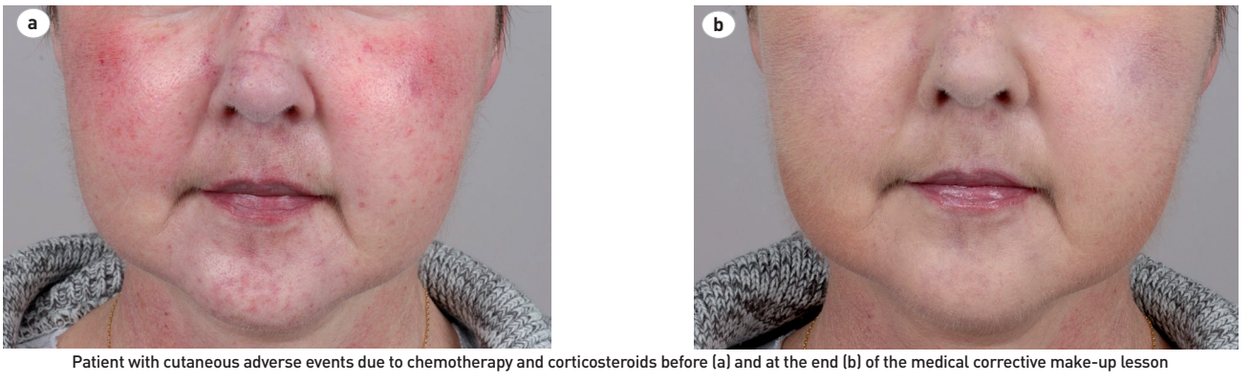
The objectives of this study were to evaluate the evolution of quality of life one month after a medical corrective make-up consultation for various skin diseases, and make-up use at home since consultation.

MATERIAL AND METHODS

All patients coming to our medical corrective make-up consultation were included during a 46 months period (2009 - October 2012) in an open monocentric study. Patients were asked to fill in a Dermatology Life Quality Index (DLQI) questionnaire before the consultation. A nurse of the department of Dermato Oncology applied La Roche-Posay make-up according to the patients' requests. Lessons impact was evaluated one month later using a postal questionnaire, including a DLQI and 7 questions on make-up realization at home since consultation.

RESULTS

One hundred and seventy-seven patients, mostly women (90%), aged from 4 to 81, have participated to our consultations for 46 months. One hundred and twenty-six patients sent back the questionnaire at one month (71%). Among them, 46 had acne, 15 rosacea, 27 scars of cancer, 13 pigmentary disorders, 6 chemotherapy adverse events, 5 angiomas and 21 various other cutaneous lesions. Nine had 2 associated cutaneous diseases.



Patient with cutaneous adverse events due to chemotherapy and corticosteroids before (a) and at the end (b) of the medical corrective make-up lesson

Variations of DLQI are summarized in table 1. DLQI significantly decreased one month after the medical corrective consultation with nurse ($p<0.001$). Ninety-two patients (74%) reported an improvement in their DLQI one month after consultation, including 12 of more than 10 points. Only 19 patients (15%) reported a worsening of their DLQI including none of more than 10 points.
Ninety-three percent of patients continued to use make-up at home after consultation, including 50% every day and 25% only for special occasions. Ninety-one percent declared being satisfied with the results of make-up at home and 88% feeling more comfortable in their social life. Ninety-eight percent had an excellent tolerance of their make-up.

DLQI scores before (M0) and 1 month after (M1) the lesson with patient number distribution by DLQI impact categories

DLQI (/30)	DLQI range	Mean DLQI (+/-SD)	No impact DLQI 0-1	Small impact DLQI 2-5	Moderate impact DLQI 6-10	Very large impact DLQI 11-20	Extremely large impact DLQI 21-30
M0	0-28	7 (+/-5.1)	13	44	41	21	6
M1	0-27	4 (+/-4.1)	34	58	24	8	1

DISCUSSION

This is the largest French study evaluating with a validated tool the impact on the quality of life of a make-up consultation performed by a nurse. It shows a significant increase of quality of life (DLQI tool) after one month. Satisfaction of patients is confirmed by a large use of make-up at home after the consultation. Some other studies evaluated the evolution of quality of life of patients suffering from various skin diseases[1], or particular diseases, such as acnea[2] or vitiligo[3], but none explored the use of corrective make-up at home.

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ULTRAVIOLET A AND PHOTOSENSITIVITY DURING VEMURAFENIB THERAPY

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TO THE EDITOR: Vemurafenib (PLX4032, Zelboraf) is a selective inhibitor of V600E BRAF.[1] In phase 1, 2, and 3 clinical trials involving patients with tumors that have V600E BRAF mutations, vemurafenib was associated with consistent efficacy and improved survival.[2,3] These data led to approval of vemurafenib for use in the United States and Switzerland.

OBSERVATION

Common toxic effects observed with vemurafenib include arthralgia, rash, fatigue, and photosensitivity.[4] In our experience, some patients have had a severe sunburn reaction consisting of painful blistering. This reaction has affected their daily activities, including driving; such patients experience photosensitivity through glass while driving a car.

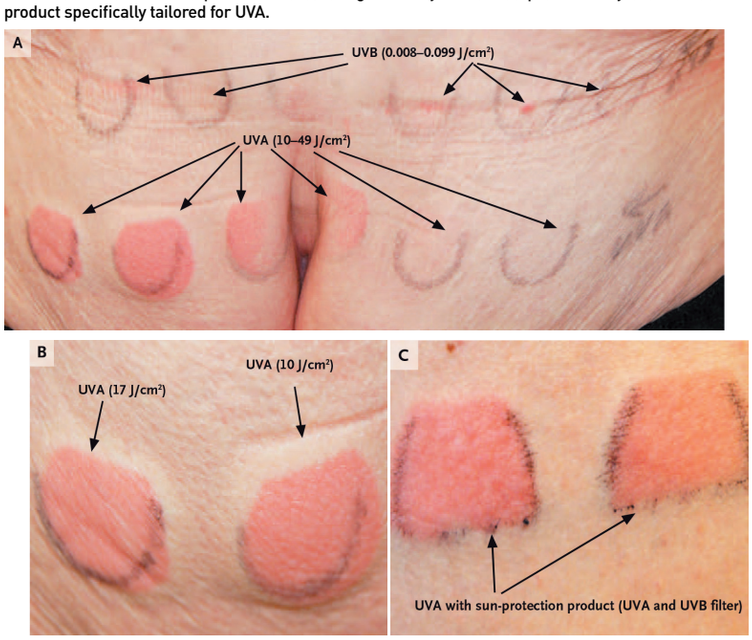
DISCUSSION

To advise patients about the most appropriate photoprotection measures, it is essential to identify the responsible ultraviolet spectrum. Therefore, we determined the minimal erythema dose (i.e., the lowest dose that results in visible erythema on depigmented skin) using ultraviolet irradiation devices (Waldmann Lichttechnik). For ultraviolet B (UVB), the emission spectrum included wavelengths from 285 to 350 nm (peak, 310 to 315), and for ultraviolet A (UVA), the emission spectrum was 330 to 450 nm (peak, 390 to 410) at 10 minutes and at 24 hours after irradiation in five patients during vemurafenib treatment. None of the patients had a history of photosensitive diseases.

The minimal erythema dose of UVB was normal (range, 0.008 to 0.099 J per square centimeter) in all patients. The minimal erythema dose of UVA (range, 10 to 49 J per square centimeter) was already strikingly reduced in all patients after 10 minutes and after 24 hours (Fig. 1A). Three patients reported a burning, painful sensation during UVA exposure. The ultraviolet-irradiated fields showed intense erythema associated with pronounced edema (Fig. 1B).

In one patient , we performed minimal erythema dose testing for UVA after the application of a UVA-tailored sun-protection product (the UVB filter was octocrylene, and the UVA filters were ecamsule, drometrizole trisiloxane, avobenzone, and titanium dioxide), resulting in a complete normalization (Fig. 1C).

Figure 1: **Photosensitivity during Vemurafenib Therapy.**
Panel A shows the minimal erythema dose of ultraviolet B (UVB) (upper row of fields) and ultraviolet A (UVA) (lower row of fields). The fields irradiated with UVA showed increasing erythema 24 hours after irradiation. The UVB-irradiated fields did not show any erythema or pigmentation. Panel B shows UVA-induced reddening and swelling 24 hours after irradiation. Panel C shows the UVA minimal erythema dose. Prior to irradiation, the irradiation field for UVA was divided into two parts with a covering film. Erythema was prevented by a sunscreen product specifically tailored for UVA.



CONCLUSION

On the basis of the nature and the evolution of the skin lesions, we conclude that vemurafenib causes UVA-dependent phototoxicity. The UVA dependency is also compatible with reports of sunburns after ultraviolet exposure through glass while driving a car. In contrast to UVB, UVA penetrates glass.[5] This information and other UVA-specific properties such as constant intensity regardless of daylight and season should be communicated to patients who are beginning to receive therapy with vemurafenib. In our experience, broad-spectrum sunscreens were effective in eliminating UVA-induced phototoxicity, and we now routinely recommend the use of UVA-tailored sunscreens and ultraviolet-dense clothing to patients receiving vemurafenib.[5] An ultraviolet-protection schedule that takes into account UVA-dependent phototoxicity should largely prevent vemurafenib photosensitivity.

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Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

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VEMURAFENIB: AN UNUSUAL UVA-INDUCED PHOTOSENSITIVITY

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INTRODUCTION

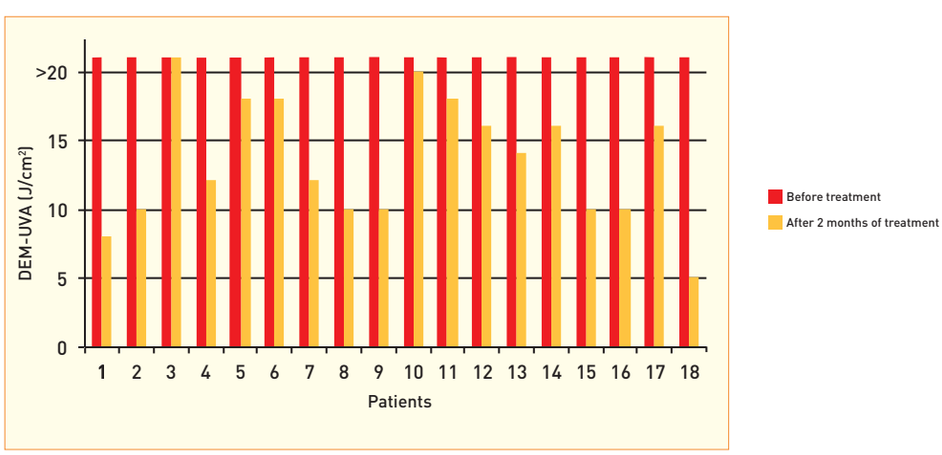
Vemurafenib is a new-targeted therapy recently approved as first line treatment in patients with V600E BRAF-mutant metastatic melanoma. Among adverse events, photosensitivity is frequent, recently noticed in 52% of patients in BRIM-2. Our study aimed to characterize more precisely this photosensitivity and to determine whether sunscreen SPF 50+ UVA-PF 42 photoprotection could prevent vemurafenib-induced photosensitivity.

MATERIAL AND METHODS

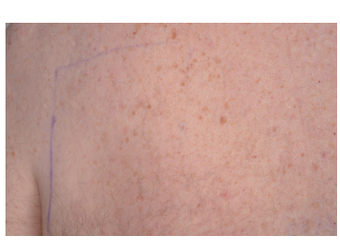
In this prospective monocentric study, 18 patients were included. Prior the first administration of vemurafenib, phototests, vitamin PP and porphyrin dosages were performed and controlled after two months of treatment. At the beginning of treatment, a dedicated nurse delivered photoprotection instructions and sunscreen with follow up notebook to patients.

RESULTS

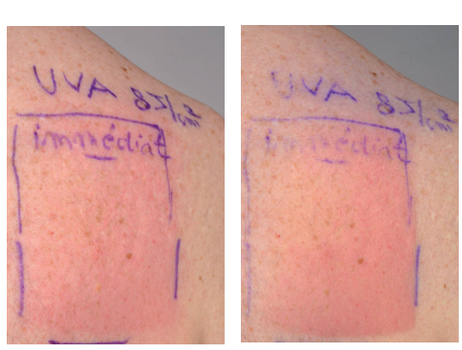
Phototests showed that for 17 of 18 patients, from normal value prior to vemurafenib, the UVA-Minimal Erythema Dose decreased under 20J/cm^2 (median=12J/cm^2) while the polychromatic MED was unchanged. The vemurafenib-induced erythema appeared quickly during UVA exposure in contrast to conventional drug phototoxicity. Besides, there was no pruritus and the erythema lasted several days contrarily to solar urticaria. Vitamin PP concentration was decreased after two months of vemurafenib and erythrocytes porphyrins increased. Photosensitivity has been experienced by 55.5% of patients. These episodes occurred during oversight or misapplication of the sunscreen except for two patients.



Evolution of DEM-UVA after 2 months of vemurafenib



Before vemurafenib



Day 0-Month 2

Day 1-Month 2

Phototest: DEM-UVA before and after 2 months of vemurafenib

CONCLUSION

Our study shows that the vemurafenib-induced photosensitivity results from a phototoxic mechanism in the UVA spectrum, indeed UVA-DEM is decreased in 94% of patients. This is a new type of phototoxicity because a painful erythema appears during the phototest but lasts a few days unlike solar urticaria. A niacin and erythrocyte porphyrin mechanism is suspected. We confirm that the high risk of vemurafenib-induced photosensitivity could be prevented by regular applications of broad spectrum sunscreen with a high UVA photoprotection.

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POST CANCER CURE AT LA ROCHE-POSAY
AN UPDATE ON OBSERVATIONAL STUDIES

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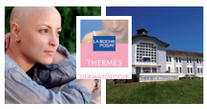


STUDY 2010/2011: Thermal Water Cure and Lipikar Balm AP

AIM: To evaluate tolerance, satisfaction and benefits of dermatological thermal cure in patients previously treated for cancer (breast, uterus, digestive...)

DEMOGRAPHICS: A total of 102 post-cancer patients undergoing thermal water treatments were recruited. Of those, 99% were females with a mean age of 57 years (31 to 88). Cancer was diagnosed at a mean age of 52 years. Among the patients recruited, 93% had undergone at least one surgical intervention, 67% had received combination therapy (radio and chemotherapy). This was the first thermal treatment for 74% of patients and 85% had a cure following breast cancer.

METHODS: During a three week stay at La Roche-Posay Thermal Center, patients received a dermatological cure based on thermal water (medicalised thread-like showers provided by a dermatologist, facial and general vaporization, baths and moist massages, thermal water to drink, specific mouth care, if necessary). During this period, patients received a bottle of Lipikar Balm AP for topical application, once or twice daily. At Day 1 and Day 18, the dermatologist completed with the patient a questionnaire to evaluate the severity of cutaneous symptoms and quality of life. Differences between baseline and end-of-cure data determined the level of improvement or eventual worsening of symptoms.

RESULTS: This study, conducted in 102 post cancer patients, confirmed the excellent tolerance (99%) and satisfaction (97%) of thermal cure. At the end of the cure, the skin condition and quality of life of patients had notably improved.

DURATION: For the 26% of patients who had already had a cure the previous year, the mean benefit duration for the cutaneous and psychological wellbeing was 8 months.

Skin improvement	Almost to complete
Flexibility and elasticity	86%
Pruritus and itching	83%
Scars	80%
Erythema	78%
Xerosis	74%
Lymphoedema	44%

Psychological improvement	Almost to complete
Overall wellbeing	94%
Social life and relationship	76%
Acceptance of scars	69%
Self-esteem	65%

STUDY 2012: Lymphoedema and functional improvement of the upper member after breast cancer

AIM: To evaluate functional recovery following a thermal cure at La Roche-Posay in patients in remission and suffering from functional problems of the upper limb following breast cancer treatment.

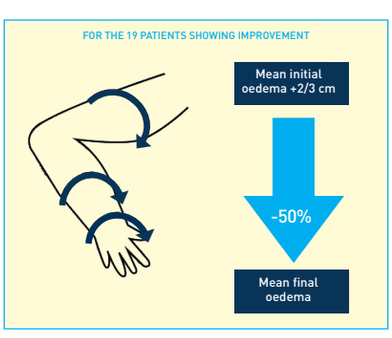
DEMOGRAPHICS: A total of 53 patients were recruited. Among those, 23 presented with oedema (≥ 1 cm) of the upper limb and 30 had functional problems of the arm following breast surgery (≤ 140°).

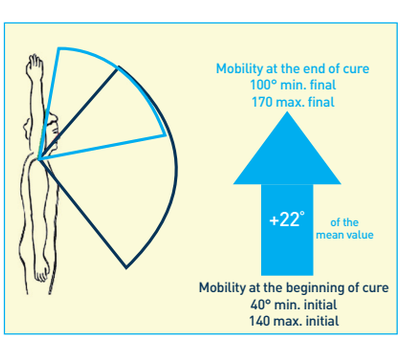
METHODS: Patients received daily dermatological thermal care: medicalised filiform showers, localised and general vaporization, spa bath and underwater massages by a physiotherapist.To assess oedema, perimetric measurements were performed with a metered ribbon on Day 1, Day 9 and Day 18 , at three defined areas (upper arm: 15 cm above the epicondyle, lower arm: 10 cm under the epicondyle and at the wrist). To assess mobility, flexion angle measurements were performed with a goniometer on Day 1, Day 9 and Day 18.

RESULTS: Results from the post breast cancer cure at La Roche-Posay confirmed the improvement of cutaneous signs and symptoms (dryness, pruritus/itching, erythema, scars...) and also showed an improved functional recovery.

Significant reduction of the arm oedema

Results show a significant effect of the dermatological cure on the oedema of the upper limb with a reduction of the diameter in 83% of the patients examined at the end of the cure. Overall, the measured improvement in 19 patients showed a mean oedema reduction of 50%; oedema remained unchanged in four patients. There was no worsening of the oedema.





Improvement of arm mobility

Results indicate an improvement of the amplitude of the arm mobility in all 30 patients examined. The mean flex value increased from 113 to 135. In those patients bothered the most, the improvement was very notable for the angle between 0° and 90°.

STUDY 2012: Pain and mobility after breast cancer surgery

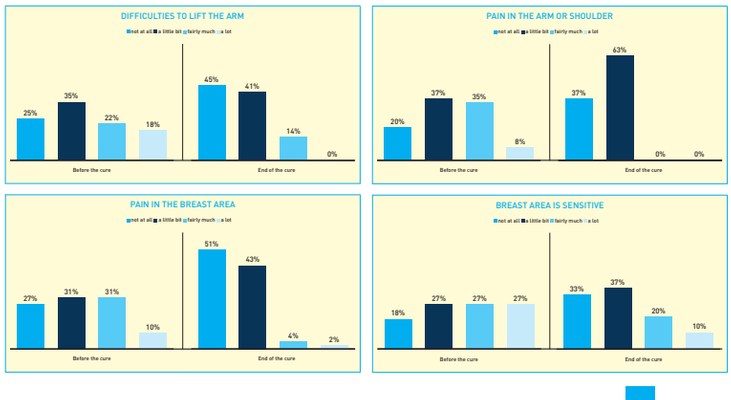
AIM: To evaluate the benefit of a thermal cure, in terms of quality of life, following treatment for pain and mobility of the area effected by surgery.

DEMOGRAPHICS: A total of 51 female patients had a thermal cure following breast ablation due to cancer. The mean age was 56 years, this was the first thermal cure for 82% of patients.

METHODS: The study population received daily thermal dermatological care: medical filiform showers, general and local vaporisation, spa bath, underwater massages by a physiotherapist. The quality of life scales were approved by the French association AFSOS (Association Francophone pour les Soins Oncologiques de Support). The study was conducted throughout auto-evaluation EORTC (European Organization for Research & Treatment of Cancer), QLQ (Quality of life questionnaire) BR23 (questions 47 to 53) at the beginning (Day 1) and end (Day 18) of the cure.

RESULTS: Pain sensation in the breast and arm disappeared or showed major improvement. Other observations allowed to confirm the reduction of skin problems with an almost disappearance of the oedema in the breast area.

During the last week you had



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NOTES :

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