

Posters

Comparative Studies on the Irritation Potential of Surfactants

Mehling, A., Hensen, H.

Cognis Deutschland GmbH & Co. KG, Düsseldorf, Germany

Comparative studies on the irritation potential of 16 surfactants were performed using the same stock solution of surfactant for each study. The ocular irritation potential of surfactants was studied using three in vitro test systems currently being used as an alternative to animal studies, namely the red blood cell (RBC) test, the hen's egg test – chorionallantoic membrane (HET-CAM) and a commercially available ocular tissue model. The skin irritation potential was assessed based on data obtained from a 24-hour epicutaneous patch test (ECT). The soap chamber test (SCT) was used to assess the cumulative dermal irritation potential of products after repeated exposure. The pH was adjusted to the same pH depending on the test used. In each test, equivalent concentrations based on the wash active substance concentration (WAS) of each substance were tested. Tests were conducted using coded samples ('double-blind') at contract research institutes. The RBC test was essentially carried out according to INVITTOX protocol no. 37. Porcine erythrocytes were used and the pH of the test product was adjusted to pH 7.4 prior to testing. The HET-CAM test was performed in accordance with the *SOP of the COLIPA project* (1994). The products were tested at 3% WAS [pH 6.5]. Tests conducted on the ocular tissue model were carried out using samples with a concentration of 0.6% WAS [pH 7.0]. ECTs were performed by occlusively applying samples with 2% WAS [pH 6.5] to the back of the volunteers. The SCTs were conducted using test product concentrations of 1% WAS [pH 6.5]. Test substances were applied to the ventral forearm of the volunteers (day 1). Following an initial occlusive application of the test substance for 24 h, further occlusive patches were applied for 6 h per day on the next 4 days. The parameters erythema, scaling and fissure were assessed on days 2, 3, 4, 5 and 8. Transepidermal water loss (TEWL) was measured on days 1, 5 and 8. Chromameter a* measurements were made on days 1 and 8. In general, clusters of substances with varying irritation potential were identified similarly by most tests, e.g. surfactants with the highest irritation potentials such ammonium lauryl sulphate, sodium lauryl sulphate and surfactants with a more moderate irritating potential e.g. sodium laureth sulfate and sodium myreth sulphate as well as mild surfactants e.g. laureth-7 citrate, alkyl polyglucosides, and sodium

cocoyl hydrolyzed wheat protein were found in the same clusters. The amphoteric surfactants and betaine varied depending on the test used. Disodium laureth sulfosuccinate exhibited a higher irritation potential in the RBC test than in other tests. The irritation potential of cocoamidopropylbetaine was over-predicted when assessed via the HET-CAM test. These results show that when using standardized test conditions in which pH and % AS are the same for each surfactant tested, there is a good correlation between the in vitro ocular irritation assays themselves and between the dermal and ocular irritation assays. Therefore, an initial assessment of surfactants in respect to both their ocular and dermal irritation potential, e.g. for screening purposes, can be achieved by using the above mentioned standardized test conditions.

Tefillin Dermatitis

Trattner, A., David, M.

Department of Dermatology, Rabin Medical Center, Beilinson Campus, Petah Tikva and Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Tefillin (phylacteries) are a religious article worn by observant Jewish men. Only two cases of allergic contact dermatitis from tefillin have been reported previously. We describe seven new cases of tefillin contact dermatitis. All our patients had contact allergy to potassium dichromate, which was the only allergen relevant to tefillin.

Allergic Reactions to (Meth)Acrylates in a 10-Year Period

Alanko, K., Jolanki, R.

Finnish Institute of Occupational Health (FIOH), Helsinki, Finland

Background: The use of plastic materials in dental work has increased much in the past 20 years in Finland. Consequently allergies to (meth)acrylate chemicals have increased as well. Acrylate allergy usually manifests as allergic contact dermatitis (ACD) on

hands, especially fingertips. We present 10-year data (October 1994 to September 2004) of patch testing with an extensive (meth)acrylate series at FIOH. **Methods:** From October 1994 to September 2004, a total of 405 patients with a history of exposure to (meth)acrylates were tested. The patch tests were performed and scored as recommended by the International Contact Dermatitis Research Group ICDRG. The (meth)acrylate series comprised 36 chemicals. During the 10 years the series went through minor changes and all patients were not tested to all acrylates. **Results:** Among the 405 patients tested, at least one allergic patch test reaction was shown by 52 patients (13%). Allergic reactions were most commonly seen to 2-hydroxypropyl methacrylate (2-HPMA), 2-hydroxyethyl methacrylate (2-HEMA) and ethyleneglycol dimethacrylate (EGDMA). **Conclusions:** We have used a large pattern of chemicals to detect (meth)acrylate allergy because their cross-reactivity patterns are not well known. Neither can the safety data sheets be reliable; not all acrylic components are given in the sheets. At FIOH, in an earlier 10-year period (1985–1995), 48 out of 275 tested patients (17%) had an allergic reaction to (meth)acrylates. In the present data, more patients were tested, which may reflect the increase of exposures and ACD. However, knowledge about the sensitizing capacity of (meth)acrylates has improved. Also, techniques to avoid skin exposure have been developed, e.g. non-touch techniques in dental work. It may be hoped that these factors will reduce the induction of new allergies.

Facial Contact Allergy: Results of Patch Testing

Beliauskiene, A., Valiukeviciene, S.

Clinic of Skin and Venereal Diseases, Kaunas University of Medicine, Kaunas, Lithuania

Background: This study is a first retrospective pilot study in Lithuania on the detection of contact allergy. Facial dermatitis may result from allergic or irritant contact dermatitis, from endogenous conditions such as atopic or seborrheic dermatitis, rosacea or a combination of contributing factors. Irritant contact dermatitis accounts for approximately 80% of all contact dermatitis and allergic contact dermatitis (ACD) accounts for the remaining 20% [1]. European standard helps to detect allergens in 75–80% cases [2]. **Objective:** To determine the final diagnoses in patients referred for the evaluation of facial dermatitis, and the relevant allergens in those ultimately diagnosed with ACD. **Methods:** A retrospective chart analysis of 38 patients patch tested with Hermal Trolab® European standard and patients products using Finn chambers on Scanpor® in Clinic of Skin and Venereal Diseases, Kaunas University of Medicine, Lithuania during the year 2004. All patients completed a European Surveillance System on Contact Allergies questionnaire delineating occupational, demographic, and medical information. **Results:** 80% of the cases were women. Of the 38 patch tested patients, a clinically relevant allergic reaction was found in 13 (42.1%), 20 (57.9%) had contributing dermatoses other than contact dermatitis. Of these 13 patients, 8 (61.5%) had ACD with other contributing factors, and 5 (38.5%) had only ACD. Among 25 patients without any relevant allergen contributing dermatosis was in 12 cases (48%). Among patients with diffuse facial dermati-

tis, contact allergy was found in 6 (27.2%), and among those with periorbital dermatitis and perioral dermatitis –2 (40%) and 5 (45.5%), respectively. Among patients with ACD, the most common relevant allergens were personal care products, preservatives, and fragrances. **Discussion:** The findings of this pilot study showed that allergic contact dermatitis is a frequent cause of facial dermatitis in a referral clinic. However, in most patients, other diagnoses represent either the primary process or a major component contributing to the eruption. Patients with contributing dermatosis have higher risk for contact allergy, so the safety of topical medicaments and cosmetics has to be improved and the necessity of using and possible risk of sensitization have to be discussed with patients suffering from facial dermatosis. For the identification of standard and cosmetic allergens in Lithuania, further studies involving larger groups of subjects are required.

References

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Allergic Contact Dermatitis to Cocamidopropylbetain in Patients with Cosmetic Allergy

Raz O., Slodownik D., Ingber A.

Department of Dermatology, Hadassah University Hospital, Faculty of Medicine, Jerusalem, Israel

Background: Cocamidopropyl Betain (CAPB) is a common surfactant in cosmetics. It is found mostly in rinse-off products such as shampoos, bath gels and liquid soap. CAPB is a well known allergen, and recently has been named the allergen of the year. **Objective:** To determine the prevalence and patterns of allergic contact dermatitis to CAPB among patients with suspected cosmetic allergy. **Methods:** 100 consecutive patients enrolled into prospective open clinical study. 81 females and 19 males between ages 14 and 77 (mean 37). All patients were clinically and anamnestically suspected to have cosmetic allergy. All were patch tested to the cosmetic series (Chemotechnique Diagnostics, Malmö, Sweden), including CAPB 1% Aq. Association to other positive reactions to allergens, locations of dermatitis, relevancy of reactions and demographic variants were statistically analyzed. **Results:** 6 patients, all women, positively reacted to CAPB. Relevance rate was 66%. There were no other statistically significant relations between the variants. **Conclusions:** We found a contact allergy prevalence of 6% to CAPB among patients suspected to have cosmetic allergy. We also found a high relevance rate of the positive reactions. It seems that CAPB plays an important role in cosmetic allergy.

Bergamot Oil Intended for Topical Use – Attempts at a Risk Assessment of Phototoxicity

Jírová, D.^a, Kejlová, K.^a, Bendová, H.^a, Kandárová, H.^b, Weidenhoffer, Z.^a, Liebsch, M.^b

^aNational Institute of Public Health, Prague, Czech Republic;

^bFederal Institute for Risk Assessment (BfR), ZEBET at the BfR, Berlin, Germany

Bergamot oil is an aromatic substance widely used in cosmetics, particularly in perfumes. Its use is often limited due to its reported phototoxicity, which may lead to berloque dermatitis. The phototoxic reaction is usually attributed to bergapten content. Bergapten is proved to increase skin sensitivity to UV light, intensifies erythema promotion and stimulates melanocytes to produce melanin. The aim of this study was to clarify the differences in the phototoxicity of several bergamot oils obtained from different suppliers. The phototoxicity of the samples was evaluated in vitro in the 3T3 NRU Phototoxicity Test (PT) and a phototoxicity test on reconstructed human skin model (EpiDermTM, Mattek). In addition, in case of non-phototoxic classification in the EpiDerm phototoxicity assay, photo-patch testing in a limited group of human volunteers was performed. Amongst 4 different samples, two phototoxic and two non-phototoxic oils were classified by 3T3 NRU PT, however, only on the basis of borderline phototoxicity results. Surprisingly, even samples classified borderline proved to be clearly phototoxic in the EpiDerm test. In general, the skin model test and human patch test provided concordant results. In both cases, it was estimated that bergamot oils (classified as non-phototoxic by 3T3 NRU PT) were safe for use up to 1%. The skin model test therefore seems to be a useful tool in the risk assessment, since it enables to set a margin of safety before any testing in humans. Analytical analysis (applying capillary GC/MS) enabled identification and quantification of photoactive compounds present in the test samples. Besides bergapten, differences in citropten, bergamottin, geranial and neral content were identified. The different phototoxic effect may depend also on the amount of these components.

Allergic Contact Urticaria and Anaphylaxis from Occupational Airborne Exposure to HBTU

Alanko, K., Hannu, T., Kuuliala, O., Keskinen, H.

Finnish Institute of Occupational Health (FIOH), Helsinki, Finland

Objective: We report on a laboratory worker who developed occupational contact urticaria and anaphylaxis from airborne exposure to HBTU powder. **Background:** HBTU (*o*-(benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate) is a widely used chemical for solid and solution phase peptide synthesis. Previously, two cases of immediate allergic reactions and one case of allergic contact dermatitis have been reported from exposure to HBTU. **Case Report:** A 28-year-old man worked at a university laboratory which synthesized peptides using various chemical agents. His work tasks included weighing the substances which were

in powder form. He did neither use a respiratory mask nor protective gloves. The patient had had atopic dermatitis in his childhood. He had also had allergic rhinitis to birch pollen since his early twenties, and respiratory symptoms related to contacts with horse and cat. Two years earlier, exercise-induced asthma had been diagnosed. One year earlier, when weighing HBTU, he experienced redness and a burning sensation on his face associated with dyspnoea and faintness. He immediately contacted the occupational health service centre, and one minute later the physician observed the skin symptoms; lung auscultation was normal. He received antihistamine medication orally and was under medical observation for two hours. After six months, when weighing large amounts of HBTU, the patient again experienced redness on his face, cough, and dyspnoea. A few minutes later, he also felt dizzy, and there was redness on the skin of the extremities and on the chest. At the occupational health service centre, the physician observed superficial respiration, and urticaria on his face and on the flexures of his extremities; the palms of his hands were also swollen. No respiratory wheezing was noted on auscultation, and there was no laryngeal oedema, but the patient felt faint. He received intramuscular corticosteroid and peroral antihistamine medication, and was sent to the emergency unit of the local university central hospital for medical observation, where his symptoms subsided. **Investigations at FIOH:** Skin prick tests (SPT) to common environmental allergens were performed. He had allergic reactions to birch, alder and hay pollen, horse, dog and cat. SPTs with with f-moc amino acid at concentrations of 0.01, 0.1, and 1% in a water/ethanol solution were negative. SPT with HBTU at a concentration of 0.1% in water solution gave a positive reaction (12 mm + pseudopodia). A skin provocation test (i.e. open application test) with a concentration of 0.1% was negative but a concentration of 1% induced one urticaria wheal with a diameter of 4 mm during an observation time of 20 min. The test with the latter concentration was considered positive. **Discussion:** Our atopic patient had immediate, contact urticaria type skin symptoms from airborne occupational exposure to HBTU. The contact urticaria was verified by a skin application test. The patient also had respiratory symptoms and systemic urticaria consistent with anaphylaxis, but a full-blown clinical picture did not develop, because he had been able to contact the occupational health service centre without delay. A positive skin prick test indicates an IgE-mediated reaction. HBTU is a chemical that may induce allergic contact dermatitis, contact urticaria, asthma and rhinitis. Even a potentially life-threatening condition, anaphylaxis, may occur. Other chemicals which share the capability to induce both type I and type IV allergic reactions include acid anhydrides, di-isocyanates and epoxy resin.

Unconsumed Precursors and Couplers after Formation of Oxidative Hair Dyes

Søsted, H.^a, Rastogi, S.C.^b, Menné, T.^a, Duus Johansen, J.^a

^aThe National Allergy Research Centre, Department of Dermatology, University of Copenhagen, Gentofte Hospital,

^bDepartment of Environmental Chemistry and Microbiology, National Environmental Research Institute, Roskilde, Denmark

Background: Contact allergy to hair dye ingredients is a well-known entity among consumers having hair colouring done at home or at a hairdresser. Surveys show that people with allergic

contact dermatitis from hair dyeing can react to their own or others dyed hair. An oxidative hair dye product contains a precursor/coupler(dye) part and a hydrogenperoxide (oxidator) part. The amount of unconsumed precursors and couplers after mixing with the oxidator is unknown. **Objectives:** An analytical investigation with the aim to trace the amount of unconsumed precursors and couplers was performed in commercial oxidative hair dyes (n = 6). **Methods:** Oxidative hair dye products were bought in a department store in Brussels. For each hair dye product, 4 mixtures were prepared. Before and immediately after mixing the precursor/coupler with hydrogenperoxide, the precursor/coupler contents in two of the mixtures was determined by HPLC [1]. The other two mixtures were incubated for 30–45 min, followed by the quantitative determination of precursor/couplers. **Results:** The total content of precursor and couplers after mixing was significantly less compared to the total content before mixing. This indicates that the colour forming reaction starts immediately when the two components of an oxidative hair dye are mixed. The reduced content of the precursor and coupler is due to the time used for the treatment of the mixture until analysis (5–7 min). At the completion of the reaction the contents of precursors/couplers were lower compared to just after mixing, but they were still present in significant amounts. In case of PPD-based products, the unconsumed PPD after full colour development was at least 50% of the total content. Similarly unconsumed toluene-2,5-diamine in the reaction mixtures was found to be 10–60%. The concentration of unconsumed couplers resorcinol/3-aminophenol/4-aminophenol in the reaction mixtures after colour development were 0–35% of the total content. **Conclusion:** The unconsumed amounts of precursors and coupler after colour developments are so high that they are suspected to be able to sensitize persons. The fact that a minimum and a maximum development time-range is recommenced on the products, may indicate that unconsumed recursors/couplers are still present after the minimum development time.

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Protective Effects of Selected Active Ingredients of Cosmetic Products

Bendová, H., Kejlová, K., Jírová, D.

National Institute of Public Health, Prague, Czech Republic

Active ingredients of herbal origin became a regular part of cosmetic products, especially in formulations intended for consumers with sensitive or dry skin, with the aim to improve skin condition and appearance. Herbal ingredients are reported to promote physiological functions of the skin and may offer a balanced complex of health effects as moisturizing, free radical scavenging, calming and anti-inflammatory, improving skin elasticity, anti-aging, healing sunburn or chemical induced irritation. The aim of the study was to assess the significance of addition of selected herbal ingredients, used in formulations of cleaning products in order to minimize possible adverse irritative effects of tensides, e.g. Sodium Dodecyl Sulfate (SDS). The protective effects of selected active ingredients were tested in vitro in the cell culture of 3T3 fibroblasts and in the human reconstructed skin model (EpiDerm™,

Mattek), and subsequently evaluated in vivo by testing in a group of volunteers by means of closed epicutaneous patch test according to COLIPA Guidelines. The advantage of in vitro systems for prediction of biological effects in human practice was assessed. Protective effects against SLS cytotoxicity were proved in the cell culture of 3T3 fibroblasts in case of a number of natural substances, e.g. Green Tea, Aloe Vera, Pronalen Sunlife, Pronalen Cereal, Sea Silk, Pronalen Sensitive Skin and Chamomile. The effects of the most promising substances were confirmed in the 3D human skin model. Results from the in vitro systems were compared to results obtained in an experimental study comprising epicutaneous test in a group of volunteers. Although all the selected herbal substances, in accordance with results obtained in vitro, exhibited protective effect against SDS-induced skin irritation in human volunteers, the highest degree of protection in vivo was proved for Pronalen Sensitive Skin and Chamomile. The in vitro test systems were found to be a useful tool for screening of biological effects and became a valuable part of regular safety and efficacy testing of cosmetics, employed before confirmatory testing in human volunteers.

Photopatch Tests: Any News under the Sun?

Zeeli, T., Trattner, A., David, M.

Department of Dermatology, Rabin Medical Center, Petah Tikva, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Background: Little is known about photoallergic contact dermatitis in Israel. **Objective:** To find the incidence of photoallergic contact dermatitis in the Rabin Medical Center, common photoallergens and accordingly deduct future implications. **Methods:** A retrospective analysis of 76 patients with photo-distributed dermatitis and a suspected clinical photoallergic contact dermatitis who underwent photopatch testing between 1998 and 2004 was undertaken (Scandinavian standard photopatch test procedure and ICDRG criteria). Relevant data was established with the original archived photopatch test and clinical data documentation for each individual patient. **Results:** 17 patients (22%) had 22 positive reactions to allergens in the photopatch test series. Five patients (6.6%) had positive photoallergic reaction (perfume mix, balsam Peru, fenchlor, hexachlorophene and 6-methylcoumarin respectively). Fenchlor photoallergy was found irrelevant. Allergic contact dermatitis was diagnosed in 12 patients : 9 had identical readings on both sides (irradiated and non-irradiated) and 4 had positive readings on the non-irradiated side. No sunscreen photoallergens reaction was observed. **Conclusions:** Our results demonstrate minor yield of positive photopatch tests. A similar low incidence of photoallergic contact dermatitis was found in comparison to other European studies, but with no apparent sensitivity to sunscreen photoallergens.

Skin Absorption and Metabolism of Contact Allergens: *p*-Phenylenediamine

Smith Pease, C.K., Pendlington, R., Sanders, D., Minter, H., Basketter, D.A.

Unilever, Colworth House, Sharnbrook, Beds, UK

Allergic contact dermatitis (ACD) to low molecular weight chemicals (<500 g/mol) becomes manifest in susceptible individuals following exposure to both naturally occurring and synthetic chemicals. For a chemical to elicit ACD, it must first act as a sensitizer i.e. the immune system must be primed specifically to that chemical (or a cross-reactive chemical), an event without clinical effect. Typically, a sensitizer is an electrophilic, protein-reactive chemical that has the ability to react with skin nucleophiles e.g. cysteine, lysine, histidine residues in proteins etc. However, many chemicals that are sensitizers are not protein-reactive per se i.e. they are prohaptens. These include well-known sensitizers e.g. catechols, cinnamic alcohol, eugenol, isoeugenol, *p*-phenylenediamine (PPD) and other aromatic alcohols etc. It is known that such chemicals are absorbed and can undergo activation/metabolism to protein reactive species, either by chemical oxidation or bacterial/skin metabolism. It is not known as to what extent or even whether the level of skin absorption/bioavailability and extent of metabolic activation of chemical allergens can be directly related to the hazard and/or potency of skin sensitizers in man. We have investigated the skin absorption characteristics of PPD and *m*-, *o*-, and *p*-aminophenols in a well established in vitro system according to OECD test guideline 428. The extent of absorption/bioavailability of these compounds was seen to be highly dependent upon the vehicle/formulation in which it is delivered to the skin. Skin absorption data is presented for PPD delivered from either a water vehicle, acetone: olive oil, or from various oxidative systems, which can drive the oxidative formation of multimer dye formations e.g. the PPD trimer Bandrowski's base. PPD was measured as potentially bioavailable within skin at levels ranging between 1 and 20% of the applied dose (with doses ranging between 25 and 150 $\mu\text{g}/\text{cm}^2$). The extent of absorption/bioavailability was significantly influenced by the experimental conditions employed e.g. choice of vehicle, time of application, presence of an oxidising system etc. Marked differences in effect for PPD are also observed in the murine local lymph node assay, the standard assay for evaluating sensitization potency, when PPD is applied either as the free base or as the hydrochloride salt in different vehicles. Due to such experimental variability and in the absence of knowing the causative sensitizing hapten in PPD allergy (which is not trivial to identify), measures of skin exposure/bioavailability for PPD and aromatic alcohols should be interpreted with care when attempting to relate such exposure data to PPD sensitization data.

Simultaneous Quantification of Ten Cytokines in Allergic Contact Dermatitis to Potassium Dichromate using Luminex Liquichip Array

Akerman, L.^a, Trattner, A.^a, Klein, T.^b, Israeli, M.^b, Freizer, A.^c, David M.^a

^aDepartment of Dermatology, ^bTissue Typing Laboratory, and ^cStatistic Unit, Rabin Medical Center, Beilinson Campus, Petach-Tikva, Tel-Aviv University, Israel

Background: Allergic contact dermatitis (ACD), a T-cell-mediated response to hapten sensitization, is a good example of the mechanism known as delayed type hypersensitivity; and is associated with increased production of both Th1 and Th2-like cytokines. The standard assay for clinical detection of contact allergy is the patch test; however, it holds distinct disadvantages such as false negative and false positive results. Hence, there is a need for more reliable and safe diagnostic tools using peripheral blood. **Objective:** To evaluate the efficacy of a novel laboratory technique (Luminex liquichip) measuring simultaneously 10 different cytokines, in allergic contact dermatitis to potassium dichromate. **Methods:** 20 patients with proven allergy to potassium dichromate (by European standard patch test series), who had active eruption and a relevant test result participated in the study. Peripheral blood mononuclear cells (PBMC) were cultured in the presence and absence of potassium dichromate. Quantitative measurement of 10 cytokines in supernatants was done using Luminex technology (Cytokine ten-plex antibody bead kit). The following cytokines were evaluated: GM-CSF, IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-8, IL-10, IFN- γ and TNF- α . **Results:** Potassium dichromate-stimulated PBMC secreted significantly higher amounts of all the cytokines tested, except TNF- α , than non-stimulated PBMC ($p < 0.001$ – 0.028). **Conclusions:** These preliminary results offers the possibility of an in vitro test for quantitative measuring cytokine secretion in the supernatants of stimulated lymphocytes with specific allergen. Significantly higher amounts of both Th1 and Th2 cytokines was secreted from potassium dichromate-stimulated PBMC. This assay might serve in the future as an additional diagnostic tool in ACD.

Patch Test Results of Oil and Cooling Fluids Series

Freireich-Astman, M., Trattner A., David, M.

Department of Dermatology, Rabin Medical Center, Beilinson Campus, Petach Tikva, and Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Background: There is a lack of information in medical literature regarding patch test results for oils and cooling fluids. **Aim of Study:** To evaluate the relative frequencies of positive reactions to oil and cooling fluids patch test series among Israeli patients with clinically suspected contact dermatitis due to occupational exposure. **Methods:** The study group included patients with clinically suspected CD due to occupational exposure referred to the CD clinic, Rabin medical center, between January 1998 and December 2003. **Results:** Patch tests for oils and cooling fluids were per-

formed on 87 patients (Chemotechnique Diagnostics) consisting of 86 males and one female with an average age of 39.6 (range 19–77). At least one positive skin reaction was observed in 22 patients (25%). 8 patients (9%) demonstrated two positive reactions or more, altogether 35 positive skin reactions were observed. The most common allergens were Thimerosal and 2-n-octyl-4-isothiazoline-3-one, each of which was positive in 4 patients. In 18 patients (82%) the patch test results were relevant. 7 patients (32%) were vehicle mechanics or electricians. Standard patch test was performed on 20 (91%) of the patients with one or more positive reaction to oils and cooling fluids, and positive result to one or two allergens was found in 15 of them. The most common allergen in the standard patch test was colophony (5 patients), followed by formaldehyde and fragrance mix (3 patients each). **Conclusion:** There is a value in performing patch test for oil and cooling fluids in patients with clinically suspected contact dermatitis due to occupational exposure. A positive result was found in approximately a quarter of those who were tested and in most of these cases the result was clinically relevant.

Intervention on Work-Related Skin Problems in the Cleaning Industry

Schuttelaar, M.-L.A., Jansen, E.J., Scholten, C.J., Jungbauer, F.H.W., Drukker, N., Coenraads, P.J.

University Medical Center Groningen, University of Groningen, Department of Dermatology, Groningen, The Netherlands

Introduction: Occupational contact dermatitis (OCD) in the cleaning industry is due to contact with water and other skin irritants. The exact prevalence and severity of skin changes is unknown. In the prevention of OCD the usage of personal skin protection measures have a high priority. The effectiveness of intervention depends on the awareness among cleaners and their employers of problems due to wet work. **Objectives:** An intervention study with a four-month follow-up to investigate the efficacy of a skin protection program. The study aimed to collect information on the prevalence of hand eczema, knowledge and exposure to wet work. Another aim of the study was to compare questionnaire-based self-reported signs of hand eczema, with skin changes present during clinical examination. **Methods:** A series of sessions ('focus groups') were held with 409 cleaners (most of them were immigrants) and managers in the cleaning industry to assess their awareness of wet work. A skin prevention program on protective measures was implemented. Before and after implementation the knowledge of the cleaners about the risk of OCD was assessed by a questionnaire. In addition they had to answer a (translated) questionnaire about signs of hand eczema and exposure to wet work. Then they were examined on hand eczema. The follow-up questionnaires on knowledge, exposure to wet work, and clinical examination were performed four months later. Behaviour changes regarding usage of soap, cream and gloves were assessed. **Results:** The prevalence of skin symptoms was higher in males (62%) than in females (52%). The overall tendency was that the prevalence of skin symptoms was increased among those who had worked more years as a cleaner (males worked more years as a cleaner than females). At the begin-

ning of the study 56% of the cleaners were found to have clinical signs of hand eczema. Most of those cleaners scored one or two points on a severity scale, indicating that most of the clinical signs of hand eczema were minor. The sensitivity of the questionnaire on hand eczema was low because false negative self-reporting by questionnaire was common, indicating that these minor symptoms of hand eczema were probably not recognized by the employees. In the examination four months later 39% of the cleaners showed improvement in skin symptoms. The skin protection program achieved changes, like reducing exposure to wet work and improvement of knowledge on hand eczema. 33% of the cleaners reported that exposure to wet work was reduced. Some cleaners reported to have changed their behaviour in usage of soap, cream and gloves. Cleaners who followed the advices concerning wet work showed more improvement in skin symptoms than cleaners who did not. **Conclusions:** These findings demonstrate that at the beginning of the study 56% of the cleaners had clinical signs of hand eczema, and that most of the signs were minor. After implementing a skin protection program knowledge was gained and improvement on clinical signs of skin damage was observed in 39% of the cleaners. Behavioural changes in the use of soap, cream and gloves were related to improvement in clinical signs of hand eczema.

Enhancing Skin Barrier Function – A New Working Principle for Skin Protection Products?

zur Mühlen, A.^a, Klotz, A.^a, Weimans, S.^b, Veeger, M.^a, Thörner, B.^a, Eichler, J.-O.^b

^aDegussa, Stoko Skin Care, ^bDegussa, Services Krefeld, Laboratory for Toxicology and Ecology, Krefeld, Germany

Introduction: Especially during work, frequent contact with low-grade irritants over a long period may provoke skin disease being one of the most common occupational illnesses. Based on occupational skin protection programs, skin protection formulations are applied before exposure to skin irritants and subsequent barrier damage. Their main way of action is often based on a physical barrier function, thus formulations with high oil-content (w/o-emulsions, lipid pastes) are used to protect the skin against water-based working substances and hydrophilic formulations are used for cases where skin comes in contact with oily based substances. One disadvantage of a physical barrier is the lacking of user acceptance and problems which may result from product residues on working surfaces. A new approach in formulating highly effective skin protection products with high consumer acceptance is to strengthen the skin's natural barrier. There are numerous in vivo tests available to monitor the protective effects of protection creams following barrier damage. However none of these tests give any information about potential biochemical mechanism of skin barrier protection. The aim of this study was to elucidate the barrier-supporting mechanism of a skin protection cream by using a 3D-skin model. **Method:** To investigate the protective and skin barrier supporting effects, a skin protection cream was applied onto Epiderm 3D-skin models with and without irritation by sodium dodecyl sulfate (SDS). Biochemical processes were monitored by cell viability (LDH release), inflammation response (IL-1 α) and

skin barrier function (skin lipid content). **Results:** In the skin model test, sodium dodecyl sulfate led to cell damage, an increase of pro-inflammatory markers and of some barrier lipids. These results show that skin models react similarly to sodium dodecyl sulfate compared to human skin and are therefore suitable to study skin protection mechanism. The skin protection cream protected the skin models from irritation and cell death. Additionally the formulation increased the content of skin lipids, without inducing irritation or cell death. It is likely that the high protective effect of the tested formulation is also based on the increased amount of skin barrier lipids. **Conclusion:** Utilizing the 3D-skin model it is possible to monitor skin barrier processes induced by topical products. With this model it was possible to demonstrate, that skin barrier lipids synthesis can be enhanced by a special skin protection formulation. Active skin protection by topically applied products seems possible and offers new opportunities to develop both effective and cosmetically acceptable skin protection formulations.

Compositae Dermatitis with Photosensitivity to UVA and UVB

Hallel-Halevy, D., Halevy, S.

Department of Dermatology, Soroka University Medical Center, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel

Background: Compositae dermatitis is an allergic contact dermatitis caused by plant species of the Compositae family. Compositae plant extracts are present in many cosmetics and herbal remedies. The most important allergens in the Compositae family are sesquiterpene lactones. Common presentations of Compositae dermatitis are airborne pattern and hand dermatitis, whereas generalized dermatitis is less common. Contact allergy to other allergens is common and photosensitivity may occur in Compositae sensitive individuals. Avoidance of the plants and plant extracts of the Compositae family can be difficult due to its widespread occurrence. **Case Report:** A 45 year-old man presented with a generalized pruritic eruption, summer-exacerbated. The rash distribution was most prominent in sun-exposed areas. Hands involvement was present, as well. The rash consisted of eczematous and edematous papules and plaques with a few vesicles. Histological examination was consistent with contact dermatitis. Clinical and laboratory investigations did not reveal evidence for collagen vascular disease or porphyria. Patch tests with the European standard series and the cosmetic series were positive for sesquiterpen lactone mix and cocamidopropyl betaine, respectively. Photo-patch tests with the Scandinavian series and with sesquiterpen lactone mix were negative. Photo-tests conducted with UVA and UVB revealed values of minimal erythema dose (MED) within the normal range. However, repeated irradiations with doses lower than the MED, revealed photosensitivity to both UVA and UVB. No eczematous reaction was observed following irradiation (single or repeated) with either UVA or UVB. Partial response was observed following treatment with topical and systemic corticosteroids and avoidance of sun exposure. **Conclusion:** Compositae dermatitis with photosensitivity to UVA and UVB was diagnosed in the present case. Follow-up is necessary to exclude the possible evolution to chronic actinic dermatitis.

Clinical and Biophysical Aspects of Sensitive Skin: Assessment and Protection

Wigger-Alberti, W., Callaghan, T., Wilhelm, K.P.

proDERM Institute for Applied Dermatological Research, Schenefeld/Hamburg, Germany

There is no formal definition of sensitive skin, yet the desire for well-being combined with psychosomatic and other factors has led to a population indicating a marked tendency for sensitive skin. Increased awareness of the influences unprotected exposure to the environment has on the human body has led to a simultaneous increase in so-called skin sensitivity. However, the rationality of the concept of 'sensitive skin' is still under discussion because of the variance of the number of opinions compared with the amount of data, at least until recently. Indisputable there are different aspects of sensitive skin being sensitive against all kinds of damage by the environment (e.g. UV irradiation), workplace and household products causing irritant contact dermatitis or cosmetic products causing subjective discomfort such as stinging. In recent years, considerable investigation has been performed to develop products for sensitive individuals. Common tolerability tests such as patch tests provide important information on objective skin tolerability but data obtained by these tests is insufficient to ensure minimizing sensitive reactions when products come into contact with the skin. A number of other methods are available to address this. Furthermore, products to protect against any kind of irritation are of increasing demand. Apart from the elimination of cutaneous contact to irritant substances, protective cosmetic products are targeted as one of the means of protecting sensitive skin.

Acute Irritant Contact Dermatitis of the Face Due to Imiquimod Mimicking Herpes Zoster

Solomon, M., Barzilai, A., Trau, H.

Department of Dermatology, Sheba Medical Center, affiliated with the Sackler School of Medicine, Tel Aviv University, Israel

Imiquimod has been approved for the treatment of genital warts. Multiple publications have shown treatment success using imiquimod for actinic keratoses. Recently, the appearance of ulcers secondary to imiquimod application for this indication was reported. The offered mechanism was stimulation of proinflammatory cytokines, such as tumor necrosis factor α (TNF- α). We report a 75-year-old man who was treated with imiquimod for actinic keratoses on his left side of his face. After one week, he developed severe erosions and ulcerations with secondary infection on the treated area, resembling herpes zoster. A Culture for varicella zoster virus was negative. The patient was treated with systemic antiviral drugs and antibiotics and later on with steroids with resolution of the rash. To our knowledge, this is the first documentation of severe primary irritation mimicking herpes zoster, due to imiquimod.

Contact Sensitivity to Standards Series Allergens in Spanish Allergic Patients

García-Abujeta, J.L.^a, Ferrer, M.^b, García-Granero, M.^c, Echechipia, S.^d, Leonart, R.^e, Muñoz, D.^f

^aUnidad de Alergología, Centro de Especialidades, Benidorm,

^bServicio de Alergología, Clínica Universitaria de Navarra,

^cUnidad de Estadística, Departamento de Genética,

Universidad de Navarra, ^dServicio de Alergología, Hospital

Virgen del Camino, Pamplona, ^eServicio de Alergología,

Hospital General, Manresa, ^fServicio de Alergología, Hospital Santiago Apóstol, Vitoria-Gasteiz, Spain

Background: The Cutaneous Allergic Committee (CAC) of the Allergy and Clinical Immunology Spanish Society (SEIC) planned to determine the frequency of sensitivity to standard patch test allergens in patients referred to allergic consults with suspicion of contact dermatitis. **Materials and Methods:** From 2004 to 2005, 989 patients with the diagnosis of contact dermatitis were patch tested with the GEIDC standard series in 20 centres of Allergy. 642 patients were female (71%) and 256 patients were male (29%). The patients were from 4 to 87 years of age (mean age 40.86 years). The reading of the test was done after 48 and 96 h. 58.4% of patients were referred for suspicion of contact dermatitis. General practitioners were referred the 64% of patients and 22% for dermatology specialist. The results were compared with those of a previous GEIDC study and were statistically analysed using the chi-square test. **Results:** A total of 609 patients (61.5%) had one or more positive patch test reactions. The most common allergens were nickel (33.4%), cobalt chloride (8%), thiomersal (7.7%), fragrance mix (5.8%), potassium dichromate (4.8%) and PPD (4.1%). Contact sensitivity to nickel, thiomersal, potassium dichromate and Peru Balsam was significantly more frequent in male patients, whereas nickel, cobalt, thiomersal and fragrances sensitivity was significantly more frequent in female patients. Higher sensitivity rates for nickel, mercury and thiomersal were noted in patients less than 16 years of age and nickel, PPD and fragrance mix in patients over 65 years of age. The largest occupational group were houseworkers (25.9%), students (13.3%), office workers (9.6%), alimentary industry workers (6.5%) and health workers (6%). **Comment:** Metals, thiomersal and fragrances are the leading allergens in Spanish allergic patients. Women have a higher ratio of positive reactions. The results are similar to previous reported for the GEIDC.

Subthreshold Irritant Dermatitis

Tur, E., Maibach, H.I.

Department of Dermatology, Tel Aviv Sourasky Medical Center, Tel Aviv University, Sackler School of Medicine, Tel Aviv, Israel; Department of Dermatology, University of California, San Francisco School of Medicine, San Francisco, Calif., USA

Skin reactivity to an irritant depends on the inherent irritation potential of the substance, its concentration, duration and frequency of exposure, and its ability to penetrate the tissue, in addition to the reactivity of the individual as well as extrinsic factors. Repeated or combined exposure to subthreshold concentrations of irri-

tants may cause a clinically apparent irritation. This indicates that subthreshold concentrations have a certain effect, although it is visible only after repetition. The importance of recognizing subthreshold irritation: (1) Elimination of the offending agent and protection from further exposure are important in both diagnosis and management of contact dermatitis. (2) In addition, allergy patch testing is sometimes difficult or impossible to perform with substances that are irritants. The assessment of the threshold of irritation is crucial and allows the use of subthreshold irritancy concentrations when testing for allergic contact dermatitis. (3) Cumulative irritation tests are important for the assessment of the irritation potential of topical formulations. (4) Combination of irritants at subthreshold concentrations may yield an additive or a protective effect.

Dermatitis Papulosa Juvenilís in Two Adults

Kraigher, O., Brenner, S.

Tel Aviv-Sourasky Medical Center, Tel Aviv, Israel

Introduction. Dermatitis Papulosa Juvenilís (frictional lichenoid eruption in children) (DPJ) is a dermatosis with lichenoid papules, seen mainly on the elbows and knees of children, often following contact with an abrasive material. Until now there has been no report of the condition in adults. We describe two adults, one of them pregnant, with dermatitis papulosa juvenilís on the elbows.

Case 1. A 32-year-old Ashkenazi Jewish woman in the 30th week of pregnancy presented to the emergency room in January 2005 with a viral infection accompanied by a fever of 38°C, and erythematous nonpruritic papules that had appeared on the elbows two days earlier. There was no history of rubbing or contact with any particular materials in the area. The woman reported no atopy in herself or her family. Histology of the papules showed hyperkeratosis, acanthosis, and a perivascular, periadnexal, lymphocytic infiltrate. The lesions disappeared after treatment with a class II steroid and did not recur.

Case 2. A 45-year-old female nurse of Russian-Ashkenazi with an 8-year history of type II diabetes and no atopy first complained in November 2004 of nonpruritic, erythematous, skin-colored papules on her elbows, which disappeared after treatment with a Dead Sea salt-enriched emollient. There was no history of rubbing or contact with any particular material. The lesions recurred in February 2005 and were treated with a tacrolimus-containing cream without improvement. They disappeared one week after treatment with a class III steroid and did not recur.

DPJ – Evolution of a Name. This entity was first described in 1956 by Richard Lightburn Sutton Junior as *summertime pityriasis of the elbow and knee* [1]. Ten years later Sutton together with Gables and Waisman changed the name to *frictional lichenoid eruption in children* [2]. In 1974 Goldman et al. called it *summer lichenoid dermatitis of the elbows in children* [3], and four years later Rasmussen used the name *Sutton's summerprurigo of the elbows* [4]. In 1984 Braun-Falco et al. called it *dermatitis papulosa juvenilís* [5], and in 1990 Patrizi et al. [7] named it *recurrent papular eruption of childhood*. The name *sandbox dermatitis* has also been used.

Epidemiology. DPJ has been described to date only in children of the ages of 2–12 years, with a male-female ratio of 3:1. The condition seems to occur mainly in spring and late summer.



Fig. 1. Dermatitis papulosa juvenilis in an adult.

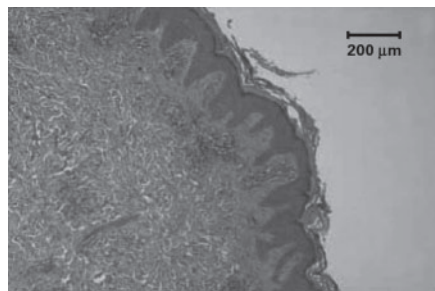


Fig. 2. Histology: superficial perivascular lymphocytic infiltrate, mild acanthosis, papillomatosis and orthokeratosis).

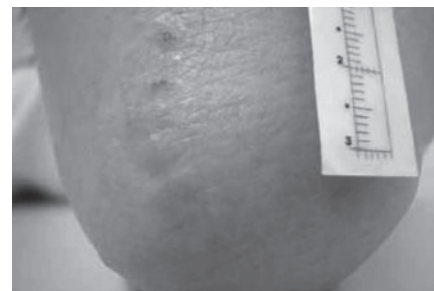


Fig. 3. Dermatitis papulosa juvenilis in an adult.

Table 1. Differential diagnosis – main differences

| Dermatosis | Morphology | Distribution | Extradermal involvement | Koebnerization | Histology | Miscellaneous |
|---|------------|--------------|-------------------------|----------------|-----------|-----------------------------------|
| PRP (type IV) | x | x | | | x | |
| Lichen planus | x | x | x | x | x | rare in children, strong pruritus |
| Actinic lichen planus | x | x | | x | x | strong pruritus |
| Lichen spirulosus | x | | | | x | |
| Lichen nitidus | x | x | | x | x | |
| Lichen amyloidosis | x | | | | x | strong pruritus |
| Lichenoid sarcoidosis | | | possible | | x | rare |
| Gianotti-Crosti-Syndrome | x | | Prodromes, HBV, EBV | | | |
| Keratosis pilaris | x | x | | | x | |
| Verrucae planae | x | | | (x) | x | |
| Mollusca contagiosa | x | | | | x | |
| Folliculosis traumatica anserina/Familial keratotic popular lesions on the chin | | x | | | x | |

Etiology. The outbreak is often, but not necessarily, preceded by contact with an abrasive material such as sand, grass, shrubbery, wool, carpeting and the like. There is a history of atopy in 20–50% of cases.

Physical Examination. The hallmark of the disease is lichenoid, flat, coalescing, inflammatory, reddish to skin-colored papules, 1–2 (–5) mm in diameter, mainly on the elbows and knees, sometimes on the back of the hands and fingers, and rarely on the cheeks and buttocks. There are no systemic findings and occasionally there is mild pruritus.

Histopathology. The histology is non-specific and is mainly used to exclude other dermatoses. The findings are hyperkeratosis, acanthosis, and a perivascular, periadnexal, lymphocytic infiltrate that does not reach the dermo-epidermal junction as in many other lichenoid dermatoses. A CD3-positive staining shows that the lymphocytes are T-type.

Therapy. Most cases can be treated with mild topical steroids, but some are cortisone resistant or recur after stopping therapy. Other treatment options are salicylic acid, tar, or urea/emollients.

Prognosis. The course is self-limiting and in most cases the lesions heal within a few weeks. The dermatosis sometimes recurs the following summer or fall.

Remarks. We suggest the term Dermatitis papulosa adultorum (DPA) for the disease in adults. DPJ remains the term for occurrence in children. These names are preferable to those mentioned above because of the occasional absence of a history of friction, the occurrence during winter in our two cases, the lack of a real lichenoid histologic infiltrate, and the fact that the lesions do not always recur.

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Combination of Clobetazole 0.05% and Zinc Sulfate 2.5% Cream in Chronic Hand Dermatitis – A Double-Blind Study

Iraji, F, Faghihi, G., Enshaieh, S., Sgahin Gohar, A.

Department of Dermatology, Medical Sciences of Isfahan University, Isfahan, Iran

Background: Chronic hand dermatitis is a common and inflammatory skin disease that tends to exacerbation and remission and often requires long treatment. The aim of this study was to determine the efficacy and safety of topical clobetazole 0.05% and zinc sulfate 2.5% cream in the treatment of chronic hand dermatitis compare it with clobetazole 0.05% cream. **Methods:** Forty-sev-

en patients (35 female and 12 male) with symmetrical chronic hand dermatitis were enrolled in the study. All topical treatments were stopped for at least 4 weeks before. The patients were allocated to receive clobetazone and zinc sulfate cream (code B) for a hand and clobetazone 0.05% cream (code A) for other hand twice a day for 2 weeks. The patients were followed up at 2 weeks intervals for 8 weeks. The results were compared between two hands in each time by Mann-Whitney U test. **Results:** At the beginning of the study severity of all symptoms (pruritus, scaling, erythema and hyperkeratosis) were similar in group A and B ($p > 0.05$). All symptoms were significantly less in group B than group A ($p < 0.05$). **Conclusion:** The trial has demonstrated that the efficacy of combination of clobetazone 0.05% and zinc sulfate 2.5% is more than clobetazone cream in chronic hand dermatitis.

Transcriptional Analysis of Monocyte-Derived Dendritic Cells following Chemical Exposure Using Low-Density cDNA Array

Tailhardat, M.^a, Bonnet-Duquennoy, M.^a, Lazou, K.^a, Kurfürst, R.^a, Courtellemont, P.^a, Le Varlet, B.^a, Nicolas, J.F.^b

^aLVMH Recherche, St. Jean de Braye, ^bInserm U503, Lyon, France

Chemical-induced allergy becomes an important occupational health problem. Development of in vitro models to identify sensitizing chemicals receives interest since animal testing should be avoided for cosmetic industry. A critical step in the induction of contact hypersensitivity is the activation and migration of dendritic cells from epidermis to the draining lymph node to sensitize naïve T lymphocytes. As the dendritic cells migrate, they undergo a maturation process. To explore the concept of chemical allergen-induced dendritic cell maturation and to identify genes that are differentially regulated by exposure to allergens, we developed a low-density cDNA array using colorimetric revelation (OLISA – Apibio corporation) and studied 75 genes on monocyte-derived dendritic cells (MDDC). Monocytes are negatively isolated from human peripheral blood using magnetic microbeads and cultured for 7 days in GM-CSF- and IL 4-supplemented medium. The effects of exposure to chemicals were performed on immature and chemical-stimulated MDDC. Cells were first incubated for 24 h with LPS, a reference molecule known to mature MDDC, then expression profiles were analysed. Our data showed that immature MDDC significantly expressed transcripts for 44/75 (59%) genes. Upon stimulation with LPS, and in samples from 5 different donors, expressions were un-

changed for 30 of these, 8 were up-regulated and 6 down-regulated. Most of these genes were not specific of DCs migration or maturation mechanisms and included genes involved in cell adhesion, signalling and stress. In conclusion, a total of 14 genes were found to be regulated during DC maturation with LPS according to previous published studies. The regulation of some of them is confirmed by real-time quantitative RT-PCR assay. In order to develop an in vitro alternative method for predicting the sensitizing potential of chemicals, we currently perform expression profiles analysis on MDDCs exposed to chemical allergens like DNBS, eugenol, isoeugenol and hydroxycitronellal. Results of this study suggest that in this model, the discrimination of strong, moderate and weak allergens from irritants requires the consideration of several markers.

Paraben 'Para-' Doxes

Hervella, M., Yanguas, J.I., Iglesias-Zamora, M.E., Larrea, M., Ros, C., Gállego, M.

Servicio de Dermatología, Hospital de Navarra, Pamplona, Navarra, Spain

Introduction: Allergic contact dermatitis to parabens is relatively infrequent, and its diagnosis is hindered by several inconsistencies or 'paradoxes'. **Methods and Case Report:** A 28-year-old caucasian woman consulted a 15-year history of cosmetic intolerance, with acute, dramatic outbreaks of dermatitis every time she applied any cream or make-up. In the last two years she would not tolerate any sunscreens neither, so she lived a life of absolute cosmetic avoidance, including all soaps and the so-called hypoallergenic products. The patch tests revealed a weak sensitisation to the paraben mix, and specifically to butylparaben, that was considered clinically relevant. Relevant strong-positive reactions were also found to the sunscreen agents octyl dimethyl-PABA (Eusolex 6007TM) and ethylhexyl-4-methoxycinnamate (Parsol MCXTM), two para-aminobenzoic acid (PABA)-related molecules. No reaction to PABA itself or other para group derivatives was found. The photo patch tests were negative. **Conclusions:** The classic 'paraben paradox' is now rarely seen, and this case illustrates the most common picture of paraben allergy at the present time: sensitisation through contact with cosmetics, and subsequent intolerance of even minimal concentrations of parabens. This situation implies that even weak positive patch test reactions to this preservatives must be traced for relevance. Other paraben 'paradoxes' are: the (in-)frequency of cross-reactions to PABA derivatives and other related molecules, and the rarely described association with photo allergy.