Reliability and validity of outcome instruments for assessing cutaneous sarcoidosis among dermatologists and non-dermatologists  

H Yeung, 1 S Faltermeier 2 and A Rosenberg 3  
1 Department of Dermatology, Emory University, Atlanta, GA and 2 Department of Dermatology, University of Pennsylvania, Philadelphia, PA  
Disease severity instruments for cutaneous sarcoidosis have been validated for use among dermatologists, but not among other specialists treating sarcoidosis. We aimed to assess the reliability and validity of the Cutaneous Sarcoidosis Activity and Morphology Instruments (CSAMI) and Sarcoidosis Activity and Severity Index (SASI) in a group of dermatologists and non-dermatologists with experience in treating sarcoidosis. Physician’s Global Assessment (PGA) and quality of life instruments were considered as references for convergent and construct validity assessment. Four dermatologists, 3 pulmonologists, and 4 rheumatologists evaluated 15 patients with facial cutaneous sarcoidosis using CSAMI, SASI, and PGA. All instruments demonstrated excellent intra-rater reliability. Inter-rater reliability was good for CSAMI Activity (intraclass correlation coefficient, 0.69; 95% CI, 0.51-0.87) and PGA (0.66, 0.47-0.85; weak for CSAMI Damage scores, 0.26, 0.11-0.52) and excellent for modified Facial SASI (0.78, 0.63-0.91). CSAMI Activity and modified Facial SASI scores both showed moderate correlations with PGA scores. CSAMI Activity, but not modified facial SASI scores, showed a combination of convergent and construct validity. However, non-significant correlations of activity scores with PGA were found in females. This large-scale study suggests that the reliability and validity of the CSAMI and SASI are sufficient for use among dermatologists and non-dermatologists sarcoidosis specialists. Construct validity correlating with quality of life measures was confirmed with CSAMI Activity but not with modified facial SASI.

The early risk of an internal malignancy development in patients with dermatitis herpetiformis seems to be exaggerated  

M Matezko, 1 I Grochowicz-Porowska, P Pietrzkiewicz and M Bowszyc-Dmochowska  
1 Department of Dermatology, Poznan University of Medical Sciences, Poznan, Poland  
Dermatitis herpetiformis (DH) is a skin disease with a quite diverse phenotype showing accompanying, either just laboratory or both laboratory and clinical, features of a gluten intolerance. There still is a tendency to understand DH, where autoimmune interferences with inflammation most likely on multiple skin pathways, in the context of celiac disease (CD). So, studies have repetitively been published suggesting that DH patients, similarly to CD patients who are not adhering to a gluten-free diet (GFD), appear to have an increased risk of lymphoma. Here, the available medical records regarding internal malignancy of DH patients with variable adherence to GFD, diagnosed with a combination of microscopic and immunofluorescence examinations of skin biopsies, were reviewed. No internal malignancies were detected in any of 119 DH patients (78 males, 41 females, age range 4-79 years) followed-up for up to 14 years since DH diagnosis. In just one DH patient, a 72-year-old female, a hormonally inactive adrenal tumor was revealed. Also, no malignancies were found before DH diagnosis. The mean time between beginning of skin rash and DH diagnosis in 49 patients was 2.9 years. Thus, analyzing our results and pertinent literature data, it is suggested that the early risk of an internal malignancy developing in DH patients, a disease widely viewed analogously to CD, may be exaggerated. Our study seems to provide yet another argument that lumping DH and CD together may be inappropriate.

Ozone exposure and extrinsic skin aging: Results from the SALIA cohort  

A Hüls, 1 T Schikowski 1, 2 U Krämer, 3 D Sugim, 1 S Steck, 4 A Vierkötter 1 and I Krümmel 1  
1 Julius-Leber Institute for Environmental Medicine, Düsseldorf, Germany and 2 Swiss Tropical Institute of Public Health, Basel, Switzerland  
Ozone is an air pollutant which can readily oxidize with molecules in the stratum corneum. Studies suggest that ozone exposure results in depletion of vitamin E and C, as well as lipid peroxidation and protein oxidation. In humans, an increase of ozone exposure was found to be associated with an increase of emergency visits due to aggravation of flare up of existing skin diseases. Furthermore, in vitro studies indicate that ozone might activate the aryl hydrocarbon receptor and thereby cause wrinkle formation. Whether ozone exposure indeed contributes to extrinsic skin aging has not yet been studied. In the present study we therefore assessed the association between long-term ozone exposure and skin aging in 806 Caucasian women from the SALIA cohort study (Study on the influence of Air pollution on Lung function, Inflammation and Aging) aged 46-80 years. Skin aging was evaluated by the SCINEXA™ score. Ozone exposure data measured by seven monitoring stations were received from the Environmental Protection Agency of the responsible federal state (LANUV, Essen). The mean ozone of the preceding five years to the investigation year determined at the monitoring station next to the residential address was assigned to the study subjects. Associations were tested by linear regression analyses and adjusted for age, body mass index, smoking, passive smoking, nitrogen dioxide, level of education, sunburns and sunbed use. Mean ozone concentrations were between 35.0 and 42.6 μg/m³. The analysis showed that a high ozone exposure was significantly associated with deeper wrinkles (p=0.003 for wrinkles on the forehead, p=0.011 for wrinkles under the eyes and p=0.020 for crow’s feet wrinkles). Importantly, this association was not altered by exposure to particulate matter PM10 (particles on the order of 10 μm or less). These results indicate that exposure to ozone might be an additional risk factor for the formation of coarse wrinkles, which contributes to extrinsic aging of human skin.

Evidence that outdoor air pollutants including particulate matter (PM) as well as gases influence skin aging in a Chinese population  

A Hüls, 1 Y Yang 1, 2 W Gao, 1 A Vierkötter, 1 T Schikowski, 1 A Ding, 1 Z Zhang, 4 MS Matsui, 1 H Kan, 4 J Lin 1, 2, 5 S Wang 4, 1 and 4 I Krümmel 1 Julius-Leber Institute for Environmental Medicine, Düsseldorf, Germany, 2 CAS – MPG-Partner Institute for Computational Biology, Shanghai Institutes of Biological Sciences, Shanghai, China, 3 Key Laboratory of Contemporary Anthropology, Fudan University, Shanghai, China, 4 China Medical City Institute of Health Sciences, Taizhou, China, 5 Key Lab of Public Health Safety, Fudan University, Shanghai, China and 6 The Estee Lauder Companies Inc, Melville, NY  
Evidence suggests that air pollution exerts detrimental effects on human skin and may contribute to skin aging. We showed that in Caucasian women related PM exposure is associated with increased wrinkle formation. As pollution exposure is a hallmark of skin aging in Asians, we now analyzed this association in a Chinese study population. In 2012-2013 we conducted a study in Taizhou assessing skin aging manifestations in Chinese men and women between 28 and 90 years of age (N=1072). Skin aging was evaluated by the SCINEXA™ score. Outdoor air pollution exposure was compared with more pigment spots on the cheeks (p=0.077). Furthermore, an increase of 14.24 μg/m³ in NO2 was associated with 40% (p=0.001), and an increase of 11.72 μg/m³ in PM10 was associated with 16% (p=0.014) more pigment spots on the cheeks. We strengthened and extend our previous notion that exposure to outdoor air pollutants influences extrinsic skin aging. They indicate that these effects may not be observed in Caucasians, but also in Chinese and that relevant outdoor pollutants do not only include PM, but also gases.
290

Thyroid abnormalities are prevalent in primary Raynaud’s phenomenon and thyroid-directed therapy may improve response to Raynaud’s treatment

291

Long-term efficacy of topical 5-fluorouracil 5% cream in treating actinic keratosis

292

Parotid-associated melanoma of unknown primary site: Clinicopathologic characteristics from a tertiary referral center

293

Phenotyping of extrinsic skin aging of German, Chinese and Japanese women

294

A retrospective analysis of the association of dioxin (agent orange) exposure and cutaneous t-cell lymphoma
Duration of oral antibiotic therapy for the treatment of adult acne: A retrospective analysis investigating adherence to guideline recommendations and opportunities for cost-savings

J Kirby, 1 TP Scharrer, 2 ES Serverling, 1 HS Ahrens 1 and SS Ferguson 1
1 Department of Dermatology, Penn State Hershey, Hershey, PA, 2 School of Medicine, Georgetown University, Washington, DC

A recent study investigated the duration of antibiotic therapy for acne in adolescents. The study of American Academy of Pediatrics guidelines was published by the Cancer Council of Australia (CCA) had the highest domain scores. CPG can be useful resources and the AGREE II instrument can evaluate quality.

Comparing cutaneous research funded by the National Institutes of Health with the United States skin disease burden

EL Hagtrom, 3 SM Patel, 1 LN Broers, 4 C Karimkhani, 5 C Dunning 6 and R Dellavalle 7
1 College of Physicians and Surgeons, Columbia University, New York, NY, 2 Stitch School of Medicine, Loyola University of Chicago, Maywood, IL, 3 Medical School of South Carolina, Charleston, SC, 4 School of Medicine, Georgetown University, Washington, DC, 5 Department of Dermatology, University of Colorado Anschutz Medical Campus, Aurora, CO and 6 Dermatology Service, Eastern Carolina Health Care System, US Department of Veterans Affairs, Denver, CO

The objective of this study was to evaluate the duration of oral antibiotic therapy for adults with acne, in reference to published guidelines. This was a retrospective cohort study of a medical claims database which included oral antibiotic prescription courses filled from 2008 to 2010 for adults ages 21 and older with acne, based on the International Classification of Diseases (ICD) 9th Revision code. There were 16,486 patients with a diagnosis of acne and were continuously enrolled during the study period. This sample included 3231 (19.6%) males and 13,257 (80.4%) females with a median (SD) age of 32.06 (16.6) years. There were 66,705 qualifying oral antibiotic prescription claims (initiation and refill), comprising 17,448 courses. Overall mean course duration was 125 days and 84.5% (14,717) were aligned with recent guidelines for duration. However, 12,040 (69.0%) courses did exceed the recommended 8 to 12 weeks for acne. This may reflect wide variation in disclosure of funding and conflicts of interest. Three guidelines were recommended for analysis. The Appraisal of Guidelines for Research and Evaluation (AGREE II) tool was used to appraise the CPG quality. The domains with the highest mean scores were domain 1 (scope and purpose) and domain 4 (clarity of presentation) with means of 50.2% and 51.1%, respectively. The domains with the lowest mean scores were domain 5 (applicability) and domain 6 (editorial independence) with means of 26.8% and 12.1%, respectively. Domain 6 (editorial independence) also had the greatest range in individual scores (8.3% to 80.6%). This may reflect wide variation in disclosure of funding and conflicts of interest. Three guidelines were recommended by at least three raters and the CPG published by the Cancer Council of Australia (CCA) had the highest domain scores. CPG can be useful resources and the AGREE II instrument can evaluate quality.

Vitamin D intake and risk of basal cell carcinoma and squamous cell carcinoma in US women and men

S Park, 1 S Wu, 1 W Li, 1 AA Qureshi 1 and E Chiu 1
1 Brigham and Women’s Hospital, Boston, MA and 2 Dermatology, Warren Alpert Medical School of Brown University, Providence, RI

Although the skin is a primary organ for vitamin D metabolism, the association between vitamin D and basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) remains unclear. A protective effect of orally taken vitamin D against skin cancer development has been reported. Little is known how the dietary intake of vitamin D is associated with the risk of BCC or SCC. We prospectively evaluated whether total (dietary + supplemental), dietary, and supplemental vitamin D intakes were associated with risk of BCC and SCC based on data from 41,530 men in the Health Professionals Follow-up Study (1986-2010) and 50,284 women in the Nurses’ Health Study (1986-2010). Dietary intake data was assessed every 2 to 4 years during the follow-up. Cov proportional hazard models were used to compute the hazard ratios (HR) and 95% confidence intervals (CI) and cohort-specific results were pooled using a random-effects model. We also performed stratified analyses by sun exposure related factors including annual UV flux at residence and history of blistering sunburns. Over 24 years of follow-up, 1,008 (1.08% CI 1.02 to 1.14) and 1,172 (95% CI = 1.12 to 1.23) respectively. Higher total and dietary vitamin D intakes were similarly associated with SCC risk although the top HR was only significant with dietary intake (HR=1.08 (95% CI 1.05 to 1.12) for total vitamin D intake and HR = 1.18 (95% CI = 1.11 to 1.26) for dietary vitamin D). The positive associations were similar by sun exposure related factors. On the other hand, total vitamin D intake was not significantly associated with increased risk of either BCC or SCC.

Bundled payment models for actinic keratosis

J Kirby, 1 J Miller 1 and DS Leslie 1
1 Department of Dermatology, Penn State Hershey, Hershey, PA and 2 Department of Public Health Sciences, Penn State Hershey, Hershey, PA

Alternative reimbursement models are being investigated to reduce costs, but there is little investigation for dermatologic conditions. The objective of this study was to develop eight bundled payment models for AK care. A retrospective cohort was obtained from a large private insurer and was used to assess services and cost for AK. The cohort was split into a test sample and a validation sample for the bundled payments. A random sample from a nationally representative dataset was used as a second validation sample. Percentile-based payments and unadjusted mean-based models were developed using descriptive statistics of the test population. Mean-based models with adjustments were based on the percent of the multivariate OLS model that correlated the variables for which payment adjustment would be made. The aim was not to perfectly forecast future costs based on prior historical payments, but to “bend the curve”, and to purposefully decrease cost. Several measures were used to evaluate the performance of the bundled payment models, including the difference between the actual and predicted cost, the number of patient-years with a predicted cost that was higher or lower than the observed cost, and the difference in the population’s total cost for the payer. Sensitivity analyses were performed. Eight percentile- and mean-based bundled payments, with and without adjustments for gender and history of skin cancer, were developed and most predicted savings over historical reimbursement. Two of the eight models, those based on the 75th percentile historical payment, did not result in theoretical savings for any group. The median-based payment without adjustments resulted in the largest theoretical decrease in cost. In contrast, the mean-based payment with adjustments resulted in the smallest theoretical savings. All of the models predicted that some patients and providers would have costs that exceeded the bundled payment. Bundled payments appear theoretically feasible for AK management, but further work is needed to determine equity and feasibility beyond this theoretical work.
ABSTRACTS | Epidemiology

301 Comparing students’ behaviors, attitudes, and knowledge on sun protection
G Prado, K Vandenberg, E Tongdee and M Florez-White
College of Medicine, Florida International University, Miami, FL
To compare the sun protection behaviors, attitudes, and knowledge of medical and non-medical students at Florida International University. We evaluated behaviors, attitudes, and knowledge using an online survey instrument designed by the research team. The survey link was emailed to all medical students. Non-medical respondents were obtained in the University Center during lunch hours and given a link to complete the survey. We sought to measure their percent correct scores in the knowledge portions and evaluate differences in their attitudes and behaviors on sun protection. Responses were as follows: 129 medical students and 166 non-medical students completed surveys. The average knowledge score was 71.6% (95% CI: 60.3-82.9) for medical students and 60.0% (95% CI: 48.7-71.3) for non-medical students (p<0.001). The groups were significantly different in 4 out of 11 possible attitudes. Medical students expressed a high belief in their risk for skin cancer (OR 9.8, 95% CI 4.6-20.8). The groups were significantly different in 3 out of 8 possible behaviors. Medical students were much more likely to report indoor tanning bed use in their lifetime (OR 5.4, 95% CI: 2.1-13.8). They were also more likely to have heard of the ABCD guidelines for moles (OR 3.3, 95% CI 1.6-6.9; p=0.002). This survey highlights the need for more dermatology education in US medical schools. Although medical students scored higher on the knowledge portion of the survey, there are gaps in that knowledge as evidenced by the low average knowledge score. This is concerning as skin cancer is a preventable disease. Sun avoidance and protection behaviors can reduce the risk of developing skin cancer later in life.

A non-dermatologist physician will initially evaluate most skin lesions. Future primary care physicians must be able to determine the characteristics of premalignant and malignant lesions in order to refer patients to a dermatologist. The aim of this study is to compare the sun protection behaviors, attitudes, and knowledge of medical and non-medical students at Florida International University.

302 The risk of cancer in patients with psoriasis: A population-based cohort study in the United Kingdom
Z Cheng,1 DB Shin,1 J Takehisa,1 A Ogdie1 and J Gilliland1
1 Dermatology, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA and 2 Rheumatology, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA
The risk of cancer in patients with psoriasis has been of special concern due to the chronic inflammatory nature of the disease, the use of immunosuppressive and ultraviolet therapies, and co-morbid factors such as smoking and obesity. There has often been conflicting data on the risk of specific cancers in patients with psoriasis including lymphoma. To further explore this association, we conducted a cohort study using a large population-based electronic medical records database of patients in the UK. The outcome of interest was incident cancer diagnosis. A total of 1,026,256 patients without psoriasis, matched on practice and visit date, and 206,556 patients with psoriasis (193,666 with mild and 12,890 with moderate-to-severe disease as defined by use of systemic or phototherapy), were included in the analysis. The adjusted hazard ratios (95% CI) for incident cancer were 1.03 (1.01-1.05), 1.02 (1.00, 1.04), and 1.21 (1.13-1.31) in the overall, mild, and severe psoriasis groups. The adjusted hazard ratio (95% CI) for incident lymphoma was 1.10 (1.00-1.21), 1.07 (0.96-1.19), and 1.68 (1.23-2.21); and the adjusted hazards ratio (95% CI) for incident skin cancer was 1.06 (1.03-1.09), 1.04 (1.00-1.07), and 1.48 (1.34-1.64) in the overall, mild, and severe psoriasis groups, respectively. The results were robust to analysis including exclusion of patients with rheumatoid and psoriatic arthritis, history of cancer, exposure to phototherapy, and analysis limited to patients seen at least once yearly by their GPs. No association was seen with solid cancers, including breast, lung, gastrointestinal and genitourinary cancer, and leukemia. In this large observational study, the risk of incident cancer, specifically lymphoma, and skin cancer was higher in patients with psoriasis compared to patients without psoriasis and this risk appears to increase with increasing disease severity independent of traditional risk factors.

303 Sex and psoriasis: An examination of sexual activity and psychometric properties of the sexual activity questionnaire (SAQ) among female psoriasis patients
AW Armstrong, A Chien, M Florez-White
Kaiser Permanente Northern California Pacific Medical Center, San Francisco, CA and 2 University of Colorado, Aurora, CO
The impact of psoriasis on sexual activity is largely unknown. The Sexual Activity Questionnaire (SAQ) is a patient self-administered questionnaire that has been validated and used in trials of gynecological diseases and breast cancer. However, it has not been used in psoriasis patients. In this study, we aimed to assess sexual activities and examine psychometrics of the SAQ in women with psoriasis. SAQ was sent to 900 female psoriasis patients. The response rate was 81% (N=729). Among the respondents, 55% had been engaged in a sexual relationship last month. Principal component analysis confirmed a three-factor structure of SAQ-F: habit, pleasure, and discomfort. A confirmatory factor analysis confirmed the same three-factor structure of SAQ-F: habit, pleasure, and discomfort. The habit subscale was the most common reason for being sexually inactive in all age groups. Among those with a partner, being “too tired” (p<0.001) and factors in partner (not interested, partner too tired, or having no sex) were the most frequent reasons for sexual inactivity. The SAQ is a useful tool with excellent psychometric properties to assess function in female psoriasis patients. Addressing factors that contribute to sexual inactivity such as the presence of genital psoriasis, not being treated for psoriasis, lacking partner, fatigue, and partner-related factors may improve sexual activity among women with psoriasis.

304 Vitiligo and associated pigmentation, sun exposure, and lifestyle factors in women
N Lazearv,1 Y Zheng1, 2 N Wang,1 S Wu,1 W Li1,1, E Cho1, 2 and AA Quevedo1, 2, 31 Dermatology, Warren Alpert Medical School at Brown University, RI, 2 Epidemiology, School of Public Health, Brown University, Providence, RI and 3 Dermatology, Rhode Island Hospital, Providence, RI
There has been interest in the genetic determinants of vitiligo by means of genome wide-association studies. However, little is known about the phenotypic and environmental risk factors of vitiligo in the United States. We conducted a prospective analysis using data from 63,315 women who responded to a question regarding personal history of vitiligo in the Nurses’ Health Study, in 2012. Self-reported clinician-diagnosed vitiligo was ascertained in a questionnaire and the time of diagnosis was asked in the following categories: 2001 or before, 2002-2005, 2006-2009, 2010-2011, 2012+. A total of 254 women reported vitiligo diagnosed over 741,525 person-years of follow-up from 2000 to 2012. Interestingly, 45.6% of women with vitiligo reported moles on their arms (193,666 with mild and 12,890 with moderate-to-severe disease as defined by use of systemic or phototherapy), were included in the analysis. The adjusted hazard ratios (95% CI) for incident cancer was 1.06 (1.03-1.09), 1.04 (1.00-1.07), and 1.48 (1.34-1.64) in the overall, mild, and severe psoriasis groups, respectively. The results were robust to analysis including exclusion of patients with rheumatoid and psoriatic arthritis, history of cancer, exposure to phototherapy, and analysis limited to patients seen at least once yearly by their GPs. No association was seen with solid cancers, including breast, lung, gastrointestinal and genitourinary cancer, and leukemia. In this large observational study, the risk of incident cancer, specifically lymphoma, and skin cancer was higher in patients with psoriasis compared to patients without psoriasis and this risk appears to increase with increasing disease severity independent of traditional risk factors.

305 A large cohort study of lithium use and melanoma incidence and progression
MM Askari,1 E Waiters,1 C Quesenberry1 and A Chien1 Kaiser Permanente, Oakland, CA and 2 Group Health Research Institute, Seattle, WA
Biological evidence suggests that lithium activates the Wnt/beta-catenin signaling pathway and may slow melanoma development. However, no published epidemiological studies have examined the association between lithium use and melanoma incidence or extent of disease at presentation. We conducted a retrospective cohort study of all adult white Kaiser Permanente Northern California (KPNC) members (n=2,210,104) from January 1, 1997 to June 30, 2012. Incident cutaneous melanomas were identified from an established KPNC cancer registry that reports to the Surveillance, Epidemiology and End Results program. Extended cox proportional hazards regression models were used to estimate adjusted hazard ratios for melanoma incidence in lithium-exposed versus unexposed groups, adjusted for potential confounders. Serum lithium levels were used as a biomarker to confirm validity of exposure. We identified 14,034 incident melanomas in the cohort, 48 of whom were exposed to lithium (0.42% of lithium-exposed groups, and 14,008 of whom were unexposed (0.64% of un exposed cohort). Lithium-exposed individuals (n=11,317) had a duration-dependent reduction in melanoma risk in mg trend 0.034). The risk reduction was confirmed with serum lithium levels. No lithium-exposed individuals presented with advanced-stage melanoma at initial diagnosis. Findings from this large cohort suggest that lithium exposure is associated with large reduction in melanoma risk and may also play a role in halting melanoma progression. Lithium may hold promise as a chemopreventative agent for melanoma.

306 WITHDRAWN

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307 Sustained reduction in skin biopsies after 5-FU treatment

W Walker,1 M Sachar,2 H Poronentsz,3 SC Chen,4,5 S Sweeter,6 R Delvalle,1 G Stricklin1 and MA Wernet1,7 1 Department of Dermatology, VA Medical Center Providence, RI; 2 Dermatology, Brown University, Providence, RI; 3 Dermatology, VA Medical Center, Atlanta, GA; 4 Dermatology, VA Healthcare System, Palo Alto, CA; 5 Dermatology, VA Medical Center, Denver, CO and 6 Dermatology, VA Healthcare System, Nashville, TN.

The risk of malignant transformation of actinic keratosis (AK) without intervention has been reported to be 0.1-0.6% per year, and AKs are treated for their malignant potential. We sought to estimate the risk of clinically-suspicious transformation of AKs as measured by biopsy rate, when treatment of an individual AK was allowed. This prospective cohort study was part of a controlled trial where 917 participants were randomized to a single 2-4 week course of topical 5-fluorouracil (5-FU) 5% cream or vehicle control cream applied to the face and ears. Biased dermatologists performed skin examinations every 6 months on 319 participants (53 participants (46%) in the 5-FU group), marking AKs and lesions-to-be-biopsied. After marking, standard photographs of the face and ears were obtained, and were later used to map and track the presence, absence, or biopsy of each AK identified at baseline. After examination and photography, some individual AKs were treated as necessary. The 5-FU group had fewer biopsies than the control group [hazard ratio (HR): 0.42, 95% CI: 0.18-0.96]. AKs on the nose were more often biopsied than the AKs on the other areas of the face or ears (HR: 5.0, 95% CI: 2.1-11.0). Our results quantify the biopsy rate of clinically-diagnosed AKs when cryotherapy is used at a topical 5-FU cream may reduce the biopsy rate by more than half over the following 2.5 years.

309 Increased utilization of high-cost care settings by patients with hidradenitis suppurativa: Investigation of disease-specific utilization

AS Khalsa1,2, MA Liu1,2 and J Kirby3 1 College of Medicine, Penn State Hershey, Hershey, PA, 2 Department of Public Health Sciences, Penn State Hershey, Hershey, PA and 3 Department of Dermatology, Penn State Hershey, Hershey, PA.

The objective of this study is to assess how patients with hidradenitis suppurativa (HS) utilize medical care and characterize the disease-specific costs, especially in “high cost” settings, such as the emergency department (ED) and inpatient units, in order to identify opportunities for improvement. A retrospective analysis of medical claims was performed to identify claims for patients with HS or psoriasis (PS). Direct costs were calculated as disease-specific 5-year cost; patient and indirect costs were excluded. Amounts are reported in 2010 US dollars and adjusted for inflation. The largest component of the total 5-year disease-specific cost for both groups was outpatient cost (HS 52.4% vs PS 44.6%). The HS group had a larger component of the total 5-year disease-specific core cost allotted to inpatient cost (23.8%) compared the PS group. More patients with HS were hospitalized than the PS group (31.2% vs 21.4%; p<0.0001). Mean inpatient costs were similar for the HS and PS groups. The proportion of patients that utilized the ED over the 5-year period was higher in the HS (52.4% vs PS 44.4%). The HS group had a larger component of the total 5-year disease-specific cost allotted to inpatient care (23.8% compared the PS group). More patients with HS were hospitalized than the PS group (31.2% vs 21.4%; p<0.0001). Mean inpatient costs were similar for the HS and PS groups. The proportion of patients that utilized the ED over the 5-year period was higher in the HS (52.4% vs PS 44.4%). The HS group had a larger component of the total 5-year disease-specific cost allotted to inpatient care (23.8% compared the PS group). More patients with HS were hospitalized than the PS group (31.2% vs 21.4%; p<0.0001).

310 The risk of Parkinson’s disease in patients with psoriasis: A population-based cohort study

J Chung1,2, J Takeshita,3 DB Shin,4 K Haynes,4 SE Arnold4 and J Gelfand1 1 Johns Hopkins Bloomberg School of Medicine, Baltimore, MD and 2 University of Pennsylvania Perelman School of Medicine, Philadelphia, PA.

Despite the growing literature on increased risks of comorbidities in psoriasis patients, little is known about the relationship between psoriasis and Parkinson’s disease (PD). Studies have shown that systemic inflammation can drive cell damage in chronic neurodegenerative diseases such as PD. Furthermore, increased plasma concentration of interleukin-6, which is frequently elevated in psoriasis, has been associated with a greater risk of developing PD. Given these findings, our goal was to determine if disease in patients with psoriasis occur in patients with psoriasis. We conducted a population-based cohort study using an electronic medical records database maintained by general practitioners in the United Kingdom. Patients with psoriasis aged 18-90 were each matched to up to five patients without psoriasis by practice and time of visit. The outcome was incident PD, defined as the patient receiving a diagnostic code for PD or a prescription treatment specific for PD. Based on treatment patterns to identify psoriasis severity, 190,287 patients with mild psoriasis and 12,690 patients with severe psoriasis were identified. After adjusting for age, sex, family history of PD, and prior exposure to medications commonly associated with drug-induced parkinsonism, the risk of PD was increased among all patients with psoriasis, with adjusted hazard ratios (95% confidence intervals) of 1.09 (0.93, 1.25), 1.01 (0.87, 1.16) and 1.25 (1.02, 1.52) in the overall, mild, and severe psoriasis groups, respectively. We performed multiple sensitivity analyses to assess the robustness of our results. We excluded patients with psoriatic arthritis; we excluded patients with rheumatoid arthritis or osteoarthritis; and we limited our analysis to patients with at least one visit per year. Our results suggest that psoriasis is associated with an increased risk of PD in a dose-dependent manner with psoriasis severity.

311 Pigmentary traits and indoor tanning bed use among women in the United States

LQ Li,1 Y Chen,2 E Cho,3 and AA Quantum Research, University of Pennsylvania, 1 Department of Dermatology, Johns Hopkins University School of Medicine, Baltimore, MD.

Individuals may exhibit dependence or addiction to tanning, which may affect use of indoor tanning beds. We hypothesized that pigmentary traits, including light hair color, presence of pho/drusted cutaneous nevi and history of severe sunburns, may be associated with tanning behavior. We used frequent indoor tanning as a surrogate for tanning dependence and investigated the association between major pigmentary traits and use of indoor tanning beds, and also the interactions between pigmentary traits and indoor tanning bed use risk of incident skin cancer. A total of 71,032 participants were included from the Nurses’ Health Study II, a prospective study of US female nurses. We collected information on indoor tanning bed use during high school/college and at ages 25 to 35 years, and estimated average indoor tanning bed use. Pigmentary traits including natural light hair color, presence of cutaneous nevi, and a higher number of severe sunburns were associated with increased indoor tanning bed use (pinteraction=0.0001 for each). The odds ratio and 95% confidence interval for 6 times of indoor tanning was 1.47 (1.07-2.03) for those with blonde or red hair, 1.27 (1.15-1.39) for those with a 0 nevi, and 1.61 (1.45-1.83) for those with 5 or more severe sunburns. During the follow-up of 1999 to 2011, we identified 916 melanomas, 1058 squamous cell carcinomas (SCCs), and 14556 basal cell carcinomas (BCC). The association between frequent indoor tanning and SCC risk was particularly stronger among those with ≥5 nevi (pinteraction=0.0002) and those with ≥2 severe sunburns (pinteraction=0.0003). In conclusion, individuals with the highest skin cancer risk type of pigmentary traits may tend to seek indoor tanning more frequently than those with the lowest skin cancer risk type. Pigmentary traits may modify the skin cancer risk posed by indoor tanning.

312 Misinformation is prevalent in psoriasis-related YouTube videos

EQ Li,1 S-Jo, Y Tang,1 J Doctor,1 A Kang1 and MA Weinstock1,2 1 MA Weinstock1,2 1 Department of Dermatology, Johns Hopkins Bloomberg School of Medicine, Baltimore, MD and 2 University of Pennsylvania Perelman School of Medicine, Philadelphia, PA.

YouTube videos related to medical topics are available on the popular website YouTube, with dermatological diseases being no exception. We examined the quality of content in psoriasis-related YouTube videos and investigated their interactions with viewers. In this cross-sectional study, YouTube was searched using the term “psoriasis.” The first 47 relevant videos in English (sum of all video views: 2,009,743) were independently categorized by two reviewers as one of the following according to previously published methodology: useful, misleading, or patient views. Disagreements were settled by a third-party reviewer. Videos were also rated on a 5-point Quality Grade Scale (QGS) (1=poor, 5=excellent) validated in a prior study. 17% of videos were useful, 21% were misleading, while 62% represented patient views. Cohen’s Kappa for inter-rater concordance between the 2 reviewers was calculated to be 0.77, indicating substantial agreement. Mean QGS scores were 4.2±1 for useful videos, 1.7±0.7 for misleading videos, and 2.2±1 for patient view-based videos (one-way ANOVA, p<0.001). Videos viewed by patients did not differ among the three categories (useful: 85.7±120, misleading: 85.6±79, and patient view: 87.1±104.6, p>0.65), while differences in numbers of “Likes” were marginally significant (useful: 31±55, misleading: 151±218, patient views: 16±125, p=0.06). Overall, useful videos were rated highest in terms of quality but were characterized by similar viewership as misleading and patient view-based videos, with possibly lower popularity compared to others in terms of “Likes.” Given the ease of access and widespread use of YouTube, it is important to be cognizant of the quality of information available to patients as it may significantly impact the treatment course and prognosis of their disease.
313

Bradford hill criteria support the surgeon general stating that indoor ultraviolet tanning causes skin cancer

C. Kaminz1, 4, A. L. Boyers,2 LM Schilling3, 5 and R. Dellavalle1, 4, 5
1 College of Physicians and Surgeons, Columbia University, New York, NY, 2 School of Medicine, Georgetown University, Washington, DC, 3 Department of Medicine, University of Colorado, Aurora, CO, 4 Department of Dermatology, University of Colorado, Aurora, CO, 5 Department of Epidemiology, Colorado School of Public Health, Aurora, CO

The Bradford Hill criteria are nine conditions which, when satisfied, strengthen causality between two factors. A causal relationship is well established between cigarette smoking and lung cancer. However, despite a call to action to prevent skin cancer in 2014 and warnings regarding the dangers of ultraviolet radiation exposure, the Surgeon General has avoided making the simple causative statement that indoor UV tanning causes skin cancer. We present evidence that the relationship between indoor UV tanning and skin cancer satisfies the nine Bradford Hill criteria just as the relationship between tobacco smoking and lung cancer does. Indoor UV tanning is globally rampant and particularly prominent among adolescent and young adult females. The skin damage caused by indoor UV tanning practice is a top public health priority and makes now the time to declare the causality between indoor UV tanning and skin cancer.

314

Young adults who frequently indoor tan report decreased sun-protective practices and low rates of total body skin examinations

Wang, S. 5 and AL Chien Department of Dermatology, Johns Hopkins University, Baltimore, MD

Indoor tanning is associated with increased risk of melanoma, one of the most common cancers in young adults. Young adults who engage in indoor tanning may be more inclined to adopt poor sun-protective practices that may further increase their risk of skin cancer. However, this association has not been fully explored in this age group. Using the 2005 and 2010 Centers for Disease Control and Prevention (CDC) National Health Interview Surveys, we conducted a cross-sectional analysis utilizing self-reported data from 5,173 non-Hispanic whites aged 18-29 with no history of skin cancer. We calculated odds ratios (OR) and 95% confidence intervals (95%CI) using logistic regression, weighted according to US Census data, and controlled for sex, region, skin sensitivity to sun, education, and family history of skin cancer. Compared to no indoor tanning use, frequent indoor tanning (10+ times) within the last year was associated with an increased risk of multiple sunburns (2+ times) within the last year (OR=2.55, 95%CI=1.92-3.39) and inversely associated with frequent use of sunscreen (OR=0.45, 95%CI=0.34-0.59), shade (OR=0.23, 95%CI=0.16-0.34), a history of sun protection (OR=0.28, 95%CI=0.20-0.39) and wearing a hat (OR=0.53, 95%CI=0.35-0.81), and long pants (OR=0.39, 95%CI=0.28-0.54) on a warm sunny day. Of young adults who frequently tanned in the last year, only 12.8% had ever had a total body skin examination (compared to no indoor tanning use) in the last year was not significantly associated with ever having had a previous total body skin examination (OR=1.21, 95%CI=0.88-1.67). These findings suggest that young adults already at increased risk for melanoma due to frequent indoor tanning may additionally be less likely to engage in frequent sun protection, which may further increase their risk for melanoma. Moreover, young adults who frequently tan indoors are not more likely to seek secondary skin cancer prevention, such as total body skin examinations.

315

Childhood versus adulthood sun exposure and skin cancer risk in Caucasian post-menopausal women in the Women’s Health Initiative

K. Banzhoff1, MS Ally, 1 M. Stefanick, 1 E. Keiser, 2 M. Spaunhurst, 3 K. Kapphahn, 4 S. Pagoto, 6
1 Advanced Research, Natura Inovação e Tecnologia de Produtos, Cajamar, Brazil and 2 Laboratory of Genetics and Molecular Cardiology, Heart Institute - University of São Paulo Medical School, São Paulo, Brazil

Sun exposure is a major risk factor for skin cancer, however the relative contribution of UV exposure during childhood vs. adulthood remains unclear. 39,186 post-menopausal women from the Women’s Health Initiative were examined in order to investigate the association between residential UV exposure (measured by geographic latitude) in childhood vs. adulthood, and risk of non-melanoma skin cancer (NMSC) and malignant melanoma (MM). Women were grouped into 4 exclusive categories based on residential UV exposure during childhood and adulthood. Over a median follow-up of 11.9 years, there were 9,195 (16.3%) cases of NMSC and 518 (0.92%) cases of MM. Compared with the reference group (women with low childhood and low adulthood UV), women with low childhood and high adulthood UV had a 39% increased risk of NMSC (OR 1.39; 1.25-1.53). Women with high childhood-high adulthood UV had a 12% increased risk of NMSC (OR 1.12; 1.03-1.21). Surprisingly, women with high childhood UV and low adulthood UV did not have a significant increased NMSC risk compared with the reference group (OR 1.07; 0.91-1.26) in multivariable models. Residential UV exposure in childhood or adulthood was not associated with increased melanoma risk. This study highlights the importance of high adulthood rather than high childhood UV for increasing NMSC risk, and the lack of association of residential UV for melanoma risk.

316

Objective and subjective qualifiers of perceived skin aging process

AP Azambuja1, MS Nakamura, 2 TF Pires, 3 AR Horimoto, 2 R Alvim, 2 JE Krieger1 and AC Pereira1
1 Advanced Research, Natura Inovação e Tecnologia de Produtos, Cajamar, Brazil and 2 Laboratory of Genetics and Molecular Cardiology, Heart Institute - University of São Paulo Medical School, São Paulo, Brazil

The aging process varies among subjects due to the superposition of intrinsic and extrinsic factors, leading to a shift between chronological and perceived age. In this study, a work conducted to understand which objective and subjective skin qualifiers are correlated to the perceived age. To do this, 393 women between 18 to 88 years old were photographed and objectively and subjectively evaluated. The difference between the mean perceived age evaluated by five dermatologists and the real age (delta) were used to classify the volunteers in 3 groups: i) “Young appearance” (delta<4 years) ii) “Matched appearance” (4 years < delta<4 years) and iii) “Aged appearance” (delta>4 years). The perception of volunteers with the “Aged appearance” showed a lower skin hydration and elasticity, measured by Cosmometer® and Cutometer® (Courage Khazaka), respectively. Also, the “Aged appearance” group showed inferior self-perception of softness, luminosity and elasticity and higher self-perception of orbital wrinkles but not forehead or nasogenian wrinkles. We in wrinkled intensity level evaluated by the dermatologists and self-declared by volunteers showed a linear correlation. These analyses indicate a set of measured and self-declared parameters that, regardless the chronological age, are determinants of a perceived age and are important indicators perceptible efficacy of cosmetic products.

317

Heritability and correlation map of skin hydration measurements with environmental and life style factors of Brazilian population

AP Azambuja1, MS Nakamura, 2 TF Pires, 3 AR Horimoto, 2 R Alvim, 2 JE Krieger1 and AC Pereira1
1 Advanced Research, Natura Inovação e Tecnologia de Produtos, Cajamar, Brazil and 2 Laboratory of Genetics and Molecular Cardiology, Heart Institute - University of São Paulo Medical School, São Paulo, Brazil

Aiming to understand environmental and lifestyle determinants of skin hydration in a populational context, a family-based study was conducted with 1255 volunteers, of 18 to 88 years old, in the highly ethnically admixture population of Brazil. Skin hydration was evaluated using Conometer® (Courage Khazaka) and associated with evaluations of health and life style evaluations and self-declared skin perceptions. Heritability analyses based on the family structure data of this population demonstrated that ~40% of skin viscoelastic parameters variation was explained by genetic factors while ~60% is determined by factors like environment, life style and routines. Linear mixed polygenic models taking into account different parts of the body (malar region, forearm and dorsal hand) and the family-based structure data indicated statistically significant associations (p < 0.05) between hydration and smoke, sun exposure, weight and sex. As expected, cigarette smoke is correlated with the worsening of skin hydration. Sun exposure was related to lower levels of hydration. Interestingly, higher weight, BMI and abdominal circumference were associated with loss of hydration properties. As presented in the Figure 1, the association between tobacco smoking and sun exposure was probably related to the pronounced loss of elasticity until the age of 45 observed in this population. A populational context, a family-based study was conducted with 921 volunteers, of 18 to 88 years old, in the highly ethnically admixture population of Brazil. Skin mechanical properties were evaluated using Cutometer® (Courage Khazaka) and associated with evaluations of health and life style evaluations, cosmetic use and self-declared skin perceptions. Heritability analyses based on the family structure data of this population demonstrated that ~40% of skin viscoelastic parameters variation was explained by genetic factors while ~60% is determined by factors like environment, life style and routines. Linear mixed polygenic models taking into account different parts of the body (malar region, forearm and dorsal hand) and the family-based structure data indicated statistically significant associations (p < 0.05) between hydration and smoke, sun exposure, weight and sex. As expected, cigarette smoke is correlated with the worsening of skin viscoelastic parameters. Interestingly, higher weight, BMI and abdominal circumference were associated with loss of viscoelastic properties. As presented in the Figure 1, the association between tobacco smoking and sun exposure was probably related to the pronounced loss of elasticity until the age of 45 observed in this population.
319 Functional characterization of AHR promoter polymorphism that contributes to reduced vitiligo risk
X Wang,1, 2 Xuan Li,1, 2 Liu, Z, Jian G, Wang, C Li and T Gao Dept. of Dermatology, Xijing Hospital, Fourth Military Medical University, X’ian, China
Background: Vitiligo is an acquired depigmentation disorder resulting from melanocyte loss. The melanocyte inherent aberrations and autoreactivity are involved in vitiligo. The aryl hydrocarbon receptor (AHR) function as a dominat regulator in skin pigmentation and skin immune system. Previous studies have suggested impaired AHR signal pathway existing in vitiligo. Thus, we hypothesized that AHR polymorphisms might contribute to vitiligo via impacting the target genes transcription related to immune response and melanocyte biology. Objectives: to evaluate the potential association between AHR polymorphisms and vitiligo risk. Methods: We first performed a case-control study of 1000 vitiligo patients and 1000 age- and gender-matched controls, using a polymorphic sequence reaction-restriction fragment length polymorphism method involving two single nucleotide polymorphisms (SNPs) of the AHR gene (-129C>T and 166G>A). We then examined the functionality of the important SNP. Results: We found that the AHR-129C>T variant was associated with decreased risk of vitiligo, and the T allele played a protective effect on vitiligo. The frequencies of the two genotypes in the vitiligo group were in agreement with the Hardy-Weinberg equilibrium. Conclusion: Our results suggested that AHR-129C>T might be a novel marker for genetic susceptibility to vitiligo, and SNP binding to the SNP region of AHR gene remains a candidate interaction involved in vitiligo.

320 Childhood eczema is associated with anemia in 18 US population-based studies
KE Drury and J Silverberg, Dermatology, Northwestern University Feinberg School of Medicine, Chicago, IL
Atopic dermatitis (AD or eczema) is a chronic inflammatory skin disorder associated with quality of life impairment and numerous allergic and non-allergic comorbidities. Previous studies found that chronic disease has differential effects on preventive healthcare utilization and health maintenance. We sought to determine the preventive health behaviors in adults and children with eczema. We analyzed the data from 2012 National Health Interview Survey including a random-sample of 34,613 US adults and 13,288 children. In multivariate survey logistic regression models controlling for socio-demographics, allergic comorbidities and frequency of healthcare interactions, history of adult eczema was associated with higher odds of vaccination for tetanus (P<0.0001), influenza (P<0.0002), hepatitis A (P<0.01) and B (P=0.0003) hum (P=0.0001), and pneumonia (P=0.0001), but not herpes zoster virus (P=0.54). In addition, adult eczema was associated with higher odds of measurement of blood glucose (P<0.0001), cholesterol (P=0.0003), blood pressure (P=0.0001), and human immunodeficiency virus infection (P<0.0001), but not gap serum of vitiligo patients and controls demonstrated that -129T allele increased levels of the AHR transcript expression, and moreover, the -129T allele favored immunosuppressive cytokine profile. Conclusions: These results suggested that the -129C>T-Variation may affect the AHR transcriptional activity in cells and may be a novel marker for genetic susceptibility to vitiligo, and SNP binding to the SNP region of AHR gene remains a candidate interaction involved in vitiligo.

321 Eczema is associated with increased preventive healthcare and health maintenance in US adults and children
MA Strom and J Silverberg, Dermatology, Northwestern University Feinberg School of Medicine, Chicago, IL
Eczema is associated with increased preventive healthcare and health maintenance.

322 Melanoma screening consequences
MA Weinberg1, 2, I L Ferns, 1 M Saul, 1 A Gellin, 3 P Risica, 1 F Solano, 1 J Lagrouse1 and J Silverberg3, 4, 1 Brown University, Providence, RI, 2 Brown Univ, Providence, RI, 3 Univ of Pittsburgh, Pittsburgh, PA and 4 Harvard SPH, Boston, MA
Melanoma screening may save lives, but also may increase morbidity and cost. A statewide screening program in Georgia increased incidence of melanoma and decreased subsequent mortality. We evaluated the consequences of screening in western Pennsylvania. In January 2014, the University of Pittsburgh Medical Center launched a melanoma screening program targeting primary care providers (PCPs) and their patients in their largest practices (Group A). This program adopted INFORMED, a validated web-based training program for detection of skin cancer, especially melanoma. PCPs in Group A were asked to perform yearly full-body skin cancer exams for patients ≥25. We compared patients in Group A to those covered by the same health plan but in primary care practices not provided INFORMED training or asked to screen patients (Group B). For melanoma diagnoses (from administrative data), and for dermatology visits and surgical procedures on the skin. We compared these between groups for the same 8 month period before (PRE) and after (POST) launch of the screening initiative. During the POST assessment there were 9,049 unique encounters among patients in Group A in which screening was performed. Overall, screening was 1.8 times more likely to occur among PCPs who had completed INFORMED training. Among Group A patients, one or more skin excisions were performed in 7.1% vs 7.3% in the PRE vs POST periods, respectively; among Group B patients, the proportions were 5.8% vs 5.8%. Dermatology visits increased by 4.2% among Group A patients and 4.5% among Group B patients. Melanoma diagnoses between these intervals were 21/10,000 PRE and 38/10,000 POST (a 81% increase) in Group A, and 20/10,000 PRE and 22/10,000 POST (a 10% increase) in Group B. These data are subject to limitations, but suggest that detection of melanoma by PCPs after web-based instruction occurred without substantially increasing skin surgeries or dermatology visits. We are extending this effort to validate these results and better understand the impact of this screening.

323 Alcohol consumption and risk of cutaneous basal cell carcinoma in women and men
S Wu,1 W Li,1 AA Qureshi1, 2 and E Cho 1, Department of Dermatology, Warren Alpert Medical School, Providence, RI and 2 Department of Dermatology, Rhode Island Hospital, Providence, RI
Alcohol consumption has been associated with increased occurrence of sunburn, an established skin cancer risk factor. We conducted a prospective study to evaluate the association between alcohol consumption and risk of cutaneous basal cell carcinoma (BCC) based on data from 81,722 women aged 36-83 in the Nurses’ Health Study II (1991-2011) and 43,703 men aged 40-75 in the Health Professionals’ Follow-up Study (1986-2010). A total of 29,751 incident BCC cases were documented over 4.0 years of follow-up. Hazard ratios (HR) and 95% confidence intervals (CI) were computed using Cox proportional hazards models. Increasing alcohol intake was associated with an increased BCC risk. Alcohol consumption has been associated with increased occurrence of sunburn, an established skin cancer risk factor.

324 Natural hair color and pain among women in the United States
W Li, 1 X Gao, 2 S Tworoger, 3 H Hao3, 4 and AA Qureshi1, 3 Brown University, Providence, RI, 2 The Pennsylvania State University, University Park, PA, 3 Brigham and Women’s Hospital, Harvard Medical School, Boston, MA and 4 Indiana University, Indianapolis, IN
Individuals with naturally red hair have been reported to be resistant to inhaled and subcutaneous local anesthetics and may experience increased pain. Recent experimental data indicate a link between hair color, β-endorphin, and sensitivity to pain. We examined the association between natural hair color and pain among women. A total of 149,664 participants were included from The Nurses’ Health Study (NHS, n=67,149) and NHS II (n=82,315). We used two questions from the Short Form-36 Health Survey on the extent of bodily pain and its interference with daily activities and calculated a pain score by averaging these two items, with a higher score indicating greater pain. Among women, individuals with lighter hair color had a higher pain score. Compared with black-haired women, pain scores were 1.05-point higher for dark brown-haired, 1.08-point higher for light brown-haired, 1.25-point higher for blonde-haired, and 1.54-point higher for red-haired participants, in the combined cohorts of NHS/NHS II (P<0.001 for all comparisons). The mean difference in pain score between red-haired and black-haired women was equivalent to the difference between participants who were 6 to 7 years apart in age. With the points 1-5 assigned to pain scores, ranked from 1-5, a pain score of 0 in hair color was associated with a 0.19-point (95% CI: 0.11 to 0.27) higher pain score (P<0.001). Pain scores tended to increase over time, with larger increases for individuals with lighter hair color (P<0.001). In conclusion, individuals with naturally lighter hair color had higher pain scores and larger increases in pain scores over time, indicating greater pain.
Dietary intake of folate and vitamins B6 and B12 and risk of psoriasis

E Cho, T Li, W Li, S Wu and A Qureshi
1 Department of Dermatology, Warren Alpert Medical School of Brown University, Providence, RI and 2 Department of Medicine, Brigham and Women’s Hospital, Boston, MA

Folate and vitamins B6 and B12 are nutrients that can lower blood homocysteine levels and have been associated with decreased cardiovascular disease risk. Case-control studies have found that individuals with psoriasis have higher plasma homocysteine and lower folate levels. However, there has been a lack of investigation on dietary intake of these nutrients in relation to incidence of psoriasis. We conducted a prospective follow-up study of largely premenopausal women in the Nurses’ Health Study II. History of physiologically varied per-person nutrient factors, such as air pollution, on eczema prevalence and severity. We hypothesized that areas with higher air pollution may have a higher prevalence of eczema and more severe disease due to the harmful effects of air pollution on the skin. We used a merged analysis of the 2007 National Survey of Children’s Health from a nationally representative sample of 64,927 children ages 0–17 years and the 2016–2017 Environmental Protection Agency’s measurements of different species of particulate matter in the air, including nitrogen dioxide (NO2), nitrate (NO3), sulfur dioxide (SO2), sulfate (SO3), carbon monoxide (CO), and ozone (O3). We stratified the results by sex, race, ethnicity, age and household income, eczema prevalence was significantly higher with higher mean annual NO2 (survey logistic regression, P=0.044), SO2 (P=0.004) and O3 (P=0.03). However, there were no associations between eczema prevalence and levels of NO (P=0.23), CO (P=0.81) or O3 (P=0.54). In particular, eczema prevalence was associated with levels of SO2 and SO3 during the winter, spring and autumn, but inversely associated with CO and NO during the winter and autumn months (P<0.01). In contrast, more severe eczema was associated with higher levels of NO3 (P=0.01), but not the other pollutants.

Eczema severity was associated with NO3 levels during all seasons, as well as CO and NO during the winter and autumn and O3 during the summer and autumn seasons (P<0.03 for all). These data suggest that higher seasonal and/or annual levels of some small particle air pollutants are harmful in childhood eczema.

Air pollution is associated with increased eczema prevalence and severity

P Kathuria and J Silverberg
Dermatology, Northwestern University Feinberg School of Medicine, Chicago, IL

Eczema often presents with seasonal flares and variable severity throughout the year. Previous studies found that eczema prevalence is associated with outdoor climate factors in the US. However, little is known about other seasonal factors, such as air pollution, on eczema prevalence and severity. We hypothesized that areas with higher air pollution may have a higher prevalence of eczema and more severe disease due to the harmful effects of air pollution on the skin. We used a merged analysis of the 2007 National Survey of Children’s Health from a nationally representative sample of 64,927 children ages 0–17 years and the 2016–2017 Environmental Protection Agency’s measurements of different species of particulate matter in the air, including nitrogen dioxide (NO2), nitrate (NO3), sulfur dioxide (SO2), sulfate (SO3), carbon monoxide (CO), and ozone (O3). We stratified the results by sex, race, ethnicity, age and household income, eczema prevalence was significantly higher with higher mean annual NO2 (survey logistic regression, P=0.044), SO2 (P=0.004) and O3 (P=0.03). However, there were no associations between eczema prevalence and levels of NO (P=0.23), CO (P=0.81) or O3 (P=0.54). In particular, eczema prevalence was associated with levels of SO2 and SO3 during the winter, spring and autumn, but inversely associated with CO and NO during the winter and autumn months (P<0.01). In contrast, more severe eczema was associated with higher levels of NO3 (P=0.01), but not the other pollutants.

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Association of keloids with systemic medical conditions: A retrospective analysis

P Adotolla and DA Glass
Dermatology, UT Southwestern Medical Center, Dallas, TX

Keloids grow invasively beyond the borders of the inciting wound, negatively impact quality of life, and occur more commonly in those of African descent. It is unclear, however, if keloids are purely cutaneous or if they correlate with other medical conditions. We administered surveys to obtain past medical history from 71 African-American participants with keloids enrolled in the Genetic Causes of Keloid Formation Study (GCKFS), a cross-sectional pilot study based in Dallas, TX. For a control population, participants in the Dallas Heart Study (DHS) were used. Six DHS participants for every GCKFS participant were matched for ethnicity, gender, and age (±26 DHS and 71 GCKFS participants). Gender and age stratification analyses were performed to determine differences in risk association. Of the ten medical conditions surveyed, participants with keloids had an increased prevalence of hypertension, diabetes, obesity, and high cholesterol compared to the general population. When stratified for gender, women with keloids had an increased prevalence of diabetes, hypertension, and obesity. When stratified for age, the 41-50 age group had an association with high cholesterol and hypertension and the 51-60 age group had an association with diabetes and hypertension. Though previous studies have identified a link between keloids and hypertension, our study suggests that keloids may have a similar pathogenesis to several systemic medical conditions, and that it may prove useful to screen African-Americans with keloids for these conditions.

Varicella vaccination is associated with increased prevalence of eczema in the US

J Silverberg and J Li
Dermatology, Northwestern University Feinberg School of Medicine, Chicago, IL

Chickenpox infection has previously been shown to protect against the development of childhood eczema in-line with the hygiene hypothesis. In 1995, the American Academy of Pediatrics recommended routine vaccination against varicella zoster virus in the US. Subsequently, rates of chickenpox infection have dramatically decreased in childhood. However, the impact of declining rates of chickenpox infection on the prevalence of eczema are unknown. We performed a meta-analysis of 17 US population-based studies (n=203,039) from the 1997-2013 National Health Interview Surveys. The US prevalence of eczema significantly increased between the years 1997 and 2013 (survey logistic regression, P=0.0001) and was inversely associated with chickenpox infection (P=0.0001). By the year 2013, however, the prevalence of eczema increased at a significantly higher rate in children without chickenpox infection compared to those who had chickenpox infection (P<0.0001 for 2003-2013). These findings suggest that widespread vaccination in children against varicella zoster virus resulted in lower rates of chickenpox infection, ultimately leading to higher rates of childhood eczema.
331 Assessment of sun exposure while traveling to sunny destinations by Canadians during the winter season
S. Kalia Dermatology and Skin Science, University of British Columbia, Vancouver, BC, Canada

Ultraviolet radiation (UVR) exposure is linked to the development of skin cancer. Majority of studies have examined the amount of UVR acquired by individuals during the summer months. There is a large proportion of individuals in northern latitude countries that travel to sunny destinations, however there is a lack of studies examining the UVR received during the winter months by these individuals. The Second National Sun Survey was utilized in which 7121 Canadians were sampled to determine: i) proportion of individuals traveling to a sunny destination during the past winter, ii) amount of UVR exposure obtained while traveling, iii) proportion of individuals trying to acquire a suntan, and iv) proportion that had a sunburn. Of the 7121 individuals, 1268 (18.4%) traveled to a sunny climate during the past winter (from October to March). 87.0% of the 1268 individuals acquired > 1 hour of average UVR exposure during their trip. As well, 37.7% of individuals tried to acquire a suntan, and 19.1% received a sunburn. The rates of sunburn are comparable to individuals traveling during summer vacations, in which 20.7% had a sunburn. According to the Second National Sun Survey a significant proportion of individuals in Canada travel to sunny destinations during the winter. These individuals tend to acquire a large amount of UVR exposure, and have sunburn rates that are comparable to summer vacations. These results provide supporting evidence that in northern latitude countries a significant proportion of individuals receive fairly high UVR exposure during the winter months.

332 Adolescent and young adult cutaneous lymphomas: Clinical spectrum and autoimmunity
GR Delost1, 2, J Selph,3 R Vyas,1 K Honda1 and KD Cooper1 1 Lake Erie College of Osteopathic Medicine, Erie, PA and 2 Dermatology, University Hospitals Case Medical Center, Cleveland, OH

Certain adolescent and young adult (AYA) cancers appear to be different than those in pediatric and adult populations. However, we do not know if this is the case for cutaneous lymphomas, which are most commonly seen in older adults. Our aim was to compare primary cutaneous lymphomas in the AYA population (defined as ages 15-39) with the adult population (greater than 39 years old), specifically clinicopathological features, autoimmune markers, and immunohistochemistry. We presented a retrospective chart review of AYA patients presented at our institution’s multidisciplinary cutaneous oncology conference from 1996 to 2014. Of the 856 patients presented, 106 (12%) fell within the AYA population at initial diagnosis. Of these patients, the most common diagnosis was mycosis fungoides (MF) (n=42, 40%) vs. 237 cases of MF in the adult population (33%). Primary cutaneous aggressive CD8+ T-cell lymphomas and Woringer-Kolop type CTCL’s appeared over-represented in the AYA group (n=8, 7.7%) relative to older adults (n=13, 1.8%), as did lymphomatoid papulosis (n=10, 9.4% compared to n=45, 6.2%). Primary cutaneous anaplastic large cell lymphomas appeared under-represented relative to older adults (n=1, 0.9% compared to n=13, 4.6%). Primary cutaneous B-cell lymphomas appeared with similar frequency in both groups (n=8, 6.4% compared to n=54, 7.4%), as did pseudolymphoma and cutaneous lymphoid hyperplasia (n=22, 20.7% compared to n=210, 29.0%). Anti-nuclear antibody (ANA) was assessed in 26/106 AYA patients with a seropositivity rate of 13%, compared to a 25% seropositivity rate in 158/724 adult patients in which ANA was completed. Extractable nuclear antigen was positive in 18% of AYA patients vs. 23% of older adults. Our study provides evidence for some shifts in the distribution of CTCL subtypes and autoimmune phenomenon in the AYA population vs. older adults. Attention to identifying CD8+ disease and ruling out autoimmune components are warranted in young adults presenting with lymphoproliferative disorders of skin.

333 Advertisement of indoor tanning to minors through high school newspapers
A Seli1, C Kamikhanlou1, K Grigoryan1, JP Lotti2 and R Dellavalle1 1 School of Medicine, University of Colorado, Aurora, CO, 2 College of Physicians and Surgeons, Columbia University, New York, NY, 3 College of Medicine, University of Cincinnati, Cincinnati, OH, 4 Robert Wood Johnson Foundation Clinical Scholars Program, Yale University, New Haven, CT and 5 Dermatology Service, Eastern Colorado Health Care System, US Department of Veteran Affairs, Denver, CO

Ultraviolet (UV) radiation is carcinogenic. Rates of melanoma are 75% greater among patients ages < 30 years with indoor UV tanning bed exposure compared to unexposed individuals. Although the World Health Organization currently recommends avoidance of indoor UV tanning for persons ages < 18 years, adolescents continue to frequent tanning parlors. Accordingly, we sought to evaluate high school newspapers in the United States for the presence of indoor UV tanning advertisements. Print editions of newspapers (n= 202) from 46 high schools were identified via publicly available websites. Indoor tanning advertisements were found in 3.0% (n=6) of newspapers from 4 unique high schools. Compared to a similar 2006 study that found indoor tanning advertisements in nearly 50% of high school newspapers, our results suggest that indoor UV tanning advertisements in high school newspapers are relatively uncommon. Regardless, the fact that any tanning parlors would be advertising in high school newspapers is certainly concerning. Future studies should examine other advertising venues, such as Facebook, Twitter, and Google, for promotion of indoor UV tanning to this population.

334 Incidence and survival of sebaceous carcinoma in the United States
R Trappali1, C Chen1, L Li2 and J Bordeaux3 1 Family Medicine & Community Health, Case Western Reserve University, Cleveland, OH, 2 Dermatology, Case Western Reserve University, Cleveland, OH and 3 Dermatology, University Hospitals at Case Western, Cleveland, OH

Incidence information on risk factors, incidence, and survival of sebaceous carcinoma is limited. The objective of the current study was to describe the incidence of and survival from primary sebaceous carcinoma. Methods: We used data from the 18 registries of the Surveillance, Epidemiology, and End Results (SEER) Program from 2000 to 2011. The cause of death, relative frequencies, 5/10 year survival rates, and incidence rates were calculated. Each parameter was analyzed by age, sex, race, and anatomic location. Results: Overall incidence was 32.5 per 100,000 person years for males and 16.4 for females. The incidence for males increased by approximately 11% over the decade, while that of females stayed constant over the decade. Incidence among women was 2.1 times lower than men (95% CI of rate ratio: 1.8-2.4). Incidence among whites was almost three times the rate among non-whites (95% CI of rate ratio: 2.7-2.9). 10-year relative survival of sebaceous carcinoma was 86.5% (95% CI: 80.3%-91.5%). The ten-year case-specific survival (deaths attributable to sebaceous carcinoma) was 16.84% (95% CI: 32.4%-41.27%). Increased age, male sex, black race, and anatomic location of extracutaneous as compared with the cutaneous were associated with significantly higher all-cause mortality (p<0.01). Conclusions: This is the largest population-based study of sebaceous carcinoma to date. Although the overall incidence of sebaceous carcinoma is increasing (primarily due to increased incidence in men), the overall mortality has decreased. Recognition of the unique demographic profile of sebaceous carcinoma as per this research is crucial in understanding the etiology of sebaceous carcinoma and determining how to prevent and care for this disease in the future.