RDS Rheumatologic Dermatology Society North America

RDS Abstract Book 2022

Oral Presentations

LUPUS ERYTHEMATOSUS / VASCULITIS

RESPONSIVENESS OF THE CLASI TO ALOPECIA AND MUCOUS MEMBRANE INVOLVEMENT: A RETROSPECTIVE STUDY OF PROSPECTIVELY COLLECTED DATA

Anisha Jobanputra BS[1], Rui Feng PhD[3], Julianne Kleitsch BA[1], Josef S. Concha MD[1], Victoria P. Werth MD[1,2]

[1]Department of Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

[2]Corporal Michael J. Crescenz VAMC, Philadelphia, PA, USA

[3]Department of Biostatistics, University of Pennsylvania, Philadelphia, PA

Email: Dr. Victoria P. Werth, werth@pennmedicine.upenn.edu

The Cutaneous Lupus Disease Activity and Severity Index (CLASI) is a responsive outcome instrument with high inter- and intra-rater reliability in patients with cutaneous lupus erythematosus (CLE). Recently, there has been interest in eliminating both the activity alopecia and mucous membrane components of the CLASI due to concerns whether presentations are truly due to lupus or other etiologies. In this retrospective study of our prospectively collected data, we examined whether the CLASI could capture a similar degree of clinical change with the removal of these components. 171 patients with alopecia and/or oral activity, two consecutive visits, and a CLASI activity (CLASI-A) ≥4 were selected for this study and grouped according to alopecia involvement. Percent change in CLASI-A scores before and after removal of alopecia and mucous membrane components were compared for each patient. Statistical analysis was performed using Paired Wilcoxon Signed Rank Test. Following removal of these components, there was a -1.39% median difference (IQR 49.18, p=0.457) in CLASI-A percent change for patients with recent hair loss or mucous membrane lesions (n=34), -2.08% median difference (IQR 137.66, p=0.013) for patients with diffuse hair loss (n=26), and -11.76% median difference (IQR 42.13, p=0.002) for patients with focal/patchy alopecia in one or more quadrants (n=111). This percent difference change was most significant for patients with focal/patchy alopecia (p=0.002) compared to patients with diffuse alopecia and recent hair loss, who saw less of an impactful difference. Exclusion of alopecia and mucous membrane involvement from the CLASI-A score limits capturing an important element of the disease, an issue given activity alopecia greatly impacts quality of life for patients with CLE. These components should be retained and continued to be scored as supported by the extensive validation of the CLASI.

Adding Anifrolumab to our Armamentarium for Discoid Lupus Erythematosus: A Retrospective Review of Early Treatment Outcomes

Katharina Shaw, MD[1], Dustin Taylor, MD[1], Stephanie Melendez, BS[1], Neda Shahriari, MD[1], Gabriela Cobos, MD[1], Avery LaChance, MD, MPH[1] and Ruth Ann Vleugels, MD, MPH, MBA[1]

[1]Department of Dermatology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts.
Email: kshaw17@bwh.harvard.edu

Cutaneous lupus erythematosus (CLE) reflects a heterogenous group of autoimmune skin diseases. While the different subtypes of CLE are united by shared pathomechanisms of action, chronic cutaneous lupus erythematosus (CCLE) – of which discoid lupus erythematosus (DLE) constitutes the majority of cases – is distinguished by its potential to cause irreversible scarring and disfigurement. Traditionally, first-line therapies for DLE have included topical glucocorticoids and antimalarials. However, treatment escalation in non-responders is often necessary with systemic corticosteroids, steroid-sparing immunosuppressive agents, thalidomide and lenalidomide demonstrating inconsistent success for refractory DLE. Thus, a substantial need for more effective therapies for DLE persists. Anifrolumab, a monoclonal antibody targeting type I interferon receptor, was FDA-approved in 2021 for the treatment of moderate-to-severe systemic lupus erythematosus (SLE). Importantly, in its hallmark phase 3 trial TULIP-2, anifrolumab demonstrated benefit in lupus-associated skin disease, with 49% of patients in the anifrolumab group experiencing a 50% or more reduction in CLASI (Cutaneous Lupus Erythematosus Disease Area and Severity Index) versus 25% in the placebo group (p=0.04). While CLE subtypes were not characterized in this trial, given that type I interferon expression is known to correlate with DLE disease activity, we hypothesized that anifrolumab might be a viable therapeutic option for patients with DLE. We queried the Research Patient Data Registry of Mass General Brigham using CLE-related ICD 9/10 codes. Demographics, clinical features, and treatment data were analyzed. Eight patients treated with anifrolumab were identified – of those who had received at least 8 weeks of therapy (n=7), all had treatment-refractory DLE. Outcome measures were improvement in patient-reported symptoms and physician observation of disease activity and damage. All patients demonstrated significant improvement in symptomatology and disease appearance within 2 months of initiating anifrolumab (Figure 1). Mean decrease and mean percentage decrease in CLASI activity score was 19 and 64.7%, respectively. Notably, prior studies have demonstrated that clinical improvement is associated with a 3- to 4-point decrease in CLASI activity score, underscoring the benefit observed in these patients. Taken together, these early results highlight anifrolumab's potential to be a viable therapeutic option for patients with DLE, including those with severe or recalcitrant disease.

Teaching Point: Anifrolumab may be a promising therapeutic option for patients with discoid lupus erythematosus, including those with severe or recalcitrant disease.

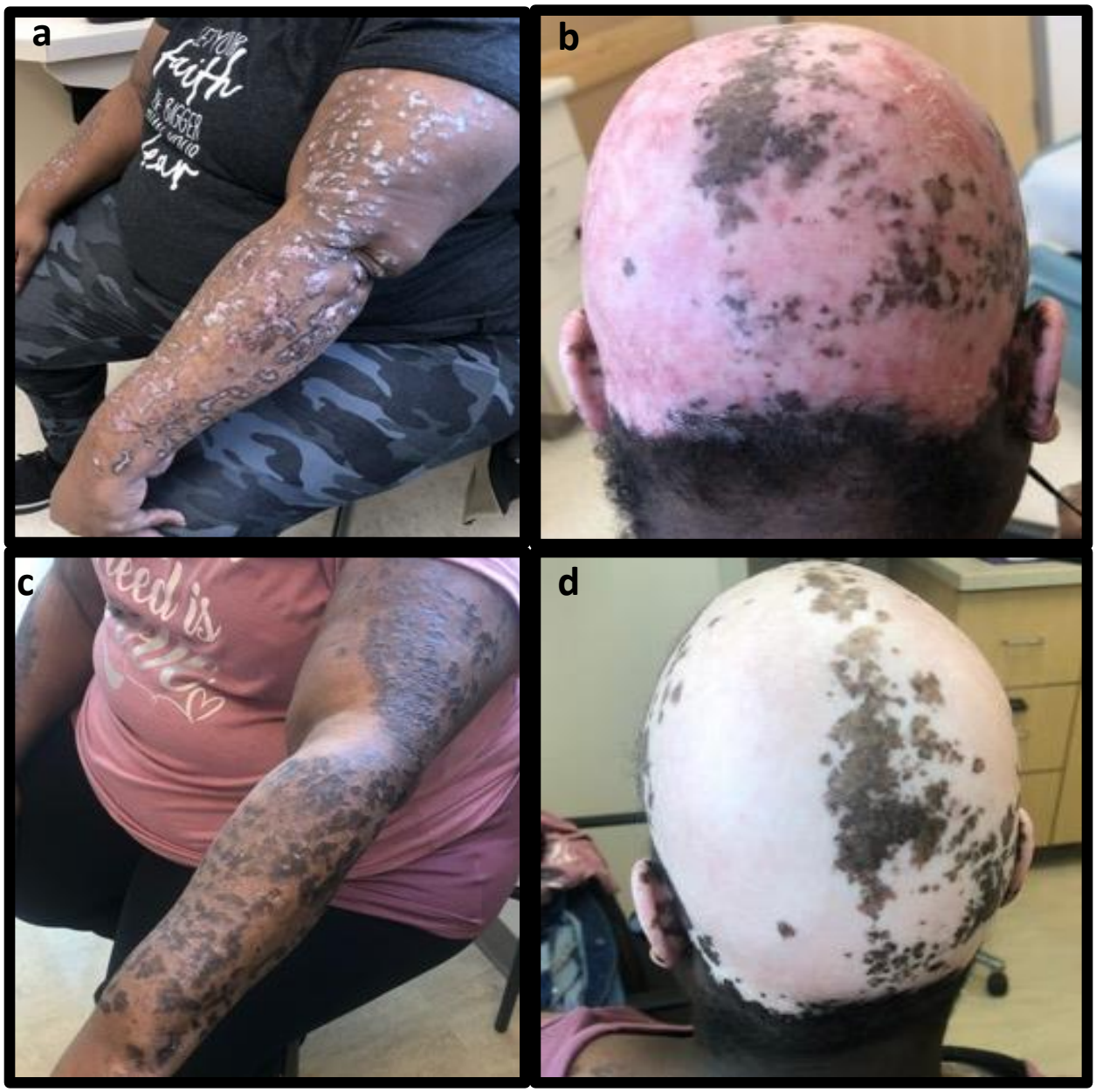


Figure 1. Representative Case: A 45-year-old patient with a history of long-standing DLE refractory to hydroxychloroquine, mycophenolate mofetil, methotrexate, azathioprine, and rituximab presented with extensive erythematous, scaly plaques with peripheral hyperpigmentation involving the upper extremities (a), chest, and scalp (b). After two months of treatment with anifrolumab, the patient still exhibited extensive post-inflammatory hyperpigmentation and scarring, but experienced dramatic improvement in disease activity with reduced erythema and scaling (c, d).

RECALCITRANT SYSTEMIC LUPUS ERYTHEMATOUS-ASSOCIATED CUTANEOUS VASCULITIS SUCCESSFULLY TREATED WITH VASCULAR TARGETED THERAPY

Suzanne Xu BS[1], Robert J. Patrignelli MD[2], Sarika Ramachandran MD[1], Fotios Koumpouras MD[3], Deborah Desir MD[3], Christine J. Ko MD[1,4], Jeff R. Gehlhausen MD, PhD

[1]Department of Dermatology, Yale University, New Haven, CT 06510

[2]Robert J. Patrignelli MD Dermatology, Trumbull CT, 06611

[3]Department of Rheumatology, Yale University, New Haven, CT 06510

[4]Department of Pathology, Yale University, New Haven, CT 06510

Cutaneous vasculitis is a manifestation of systemic lupus erythematosus (SLE) and other connective tissue diseases; management often includes high dose corticosteroids and/or systemic immunosuppressive agents. We present a case of a 43-year-old woman with a history of SLE and associated manifestations including discoid lupus, palisaded neutrophilic granulomatous dermatitis, and Raynaud's phenomenon who was referred to our clinic after approximately 1 year of tender papules, plaques, and ulcers on her hands and feet (**Figure 1**). Biopsies of the ulcers revealed vasculitis affecting the level of the deep dermis. Her finger and toe lesions were previously managed with topical and intralesional corticosteroids in addition to compounded nifedipine-verapamil without benefit. Her systemic therapies at the time included hydroxychloroquine, prednisone, azathioprine, and belimumab which did not improve her hands and feet. Prior laboratory workup revealed positive anti-nuclear antibody (1:1280), positive Sm antibody, positive dsDNA antibody, leukopenia, hypocomplementemia, and elevated erythrocyte sedimentation rate. A hypercoagulability workup including PT/INR, PTT, lupus anticoagulant, and anti-phospholipid antibodies was unrevealing. The patient was started on aspirin, pentoxifylline, and sildenafil. Additionally, she received onabotulinumtoxinA injections into her bilateral R2-R5 and L2-L5 hand digits as well as the bilateral halluces. Within 2 weeks of injections, the patient experienced significant improvement in hand function and decreased pain; by 10 weeks, both the hand and toe ulcers had completely resolved without any increase in immunosuppression (**Figure 1**). At her five-month follow-up, the lesions remained healed, and she continued vasodilator/anti-platelet therapy alone without the need for additional onabotulinumtoxinA injections. Botulinum toxin has been used with success to treat refractory Raynaud's syndrome and a previous study has demonstrated botulinum toxin injection to increase digital pulp temperatures, indicating increased blood flow. The use of vascular targeted therapy to treat acral-predominant vasculitis is a novel approach that we believe may be highly beneficial in appropriately selected cases.

Teaching point: Vascular-targeted therapy including botulinum toxin can be an effective primary or adjunctive therapy for acral-predominant vasculitis in autoimmune connective tissue disease patients.

Severe Ulcerative Perniosis Treated with Abobotulium Toxin

Stephanie Golub MS,[1] Galen Foulke MD,[2] Matthew Helm, MD[3]

[1]Pennsylvania State College of Medicine, Hershey, PA

[2]University of North Carolina, Department of Dermatology

[3]Pennsylvania State Medical Center, Department of Dermatology, Hershey, PA

Corresponding author email: sgolub@pennstatehealth.psu.edu

Perniosis (also known as pernio or chilblains), is a condition characterized by the development of pruritic, painful erythrocyanotic skin lesions induced by exposure to cold temperatures. When perniosis occurs in conjunction with clinical or laboratory features of systemic lupus erythematosus, the condition is further classified as chilblain lupus erythematosus (CHLE). CHLE is a rare condition with limited treatment options, especially in refractory cases. In this case report we discuss the utility of therapeutic botulinum toxin injections in the treatment of severe, ulcerative CHLE.

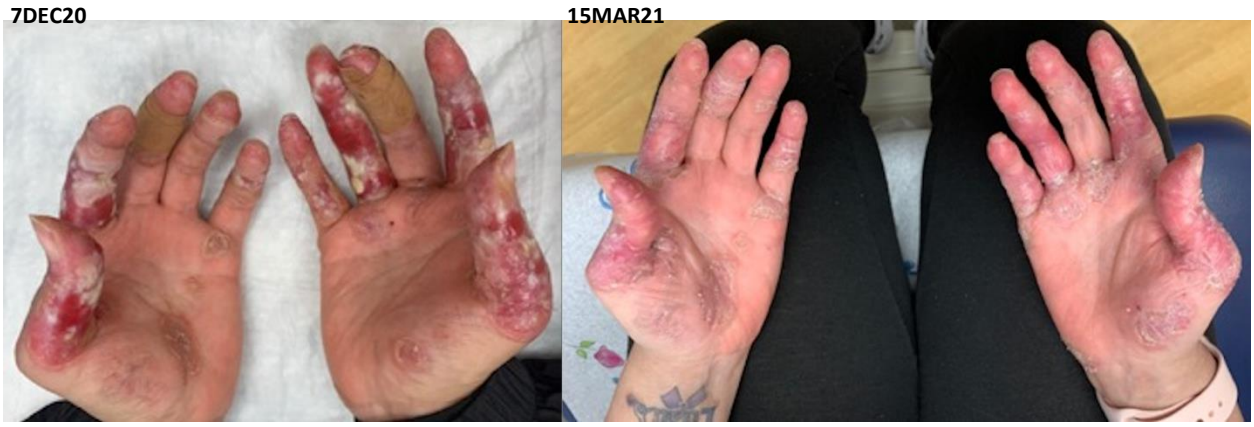


Figure 1. Patient at presentation (left) showing diffuse erythematous plaques with ulceration. Results after BTX injections (right).

Teaching point

- Botulinum toxin injections can provide significant therapeutic relief to patients suffering from refractory CHLE.

MEDICATION ADHERENCE RATE IN PATIENTS WITH CUTANEOUS AND SYSTEMIC LUPUS, A CROSS-SECTIONAL SURVEY

Eleni Pilitsi, MD[1]; Reina Gonzalez, MD[1]; Amanuel Kehasse, PharmD, PhD[2]; Hanni Menn-Josephy, MD[3]; Monica Crespo-Bosque, MD[4]; Michael York, MD[4]; Christina S. Lam, MD[1]
[1]Department of Dermatology, Boston University School of Medicine, Boston, MA, USA
[2]Department of Pharmacy, Boston Medical Center, Boston, MA, USA
[3]Division of Nephrology, Department of Medicine, Boston University School of Medicine, Boston, MA, USA
[4]Division of Rheumatology, Department of Medicine, Boston University School of Medicine, Boston, MA, USA

Email: eleni.pilitsi@bmc.org

Adherence to medications in systemic lupus erythematous (SLE) patients is suboptimal (25%-57%) and leads to poor clinical outcomes. By contrast, data on medication adherence in cutaneous lupus (CLE) patients is scarce and could influence disease outcomes and quality of life. We investigated medication adherence in patients with CLE on oral medications using the Medication Adherence Self-Report Inventory (MASRI) and explored potential barriers to adherence. For categorical variables we used chi-square or fisher's exact and for continuous variables T-test or Wilcoxon rank sum.

Fifty-one patients with a mean age of 45 were surveyed and 44 (86%) were women. Most patients (45%) identified as Black/African American (AA), followed by Hispanic/Latino (27.5%) and White (13.7%). Rates of CLE (49%) and CLE with SLE (51%) were similar. Most participants (55%) were unmarried or single, and of those, most (73.9%) were AA (**p=0.01**).

The overall adherence rate per MASRI was 80±20%, but lower in AA compared to non-AA (**70% vs 90%, p=0.006**) and similar between CLE and CLE with SLE. Patient-perceived skin disease control and rates of smoking, anxiety, depression, other comorbidities and unemployment were similar between groups.

Hydroxychloroquine was the most common medication (n=45, 88.2%), followed by mycophenolate (n=15, 29.4%), systemic steroids (n=11, 21.5%) and methotrexate (n=10, 19.6%).

The most common reported barriers to adherence were: "just forgot to take the medication" (35.3%), "did not feel like taking the medication (15.7%) and "had depressed mood" (13.7%) and there were no differences between racial/ethnic groups or lupus types.

In conclusion, medication adherence rate in patients with CLE averages 80% and appears decreased in AA. Potential contributing factors include single status, while lupus type, perceived skin disease control and regimen do not seem to play a role. These findings highlight the importance of assessing adherence and addressing potential racial and socioeconomic disparities in CLE and SLE.

ORAL MEDICATION TREATMENT NON-ADHERENCE IN PATIENTS WITH CUTANEOUS LUPUS ERYTHEMATOSUS AT A SAFETY NET HOSPITAL

Maya Adams[1], Stephen Brown, MS[2], Benjamin F. Chong, MD, MSCS[1]

[1]Department of Dermatology, University of Texas Southwestern, Dallas, TX,

[2]Deparment of Health Systems Research, Parkland Health, Dallas, TX

Email: ben.chong@utsouthwestern.edu

Treatment non-adherence can adversely affect clinical outcomes in patients with chronic dermatologic diseases. However, treatment non-adherence is not well characterized in patients with cutaneous lupus erythematosus (CLE). We performed a cross-sectional analysis to estimate the rate of medication non-adherence in patients with CLE at Parkland Health, a safety net hospital in Dallas, TX, seen between October 2014 to November 2021 and to identify risk factors associated with non-adherence.

Our primary outcome measure was the medication possession ratio (MPR), or the ratio of days that patients possessed their prescribed medication. Medication non-adherence was defined as MPR less than 80%. Univariate analyses were performed to identify risk factors associated with medication non-adherence in patients with CLE. Categorical and continuous variables were compared using the Chi-square test and Mann-Whitney test, respectively.

Out of 147 patients, 39 patients were included. The rate of medication non-adherence was 43.6% (N=19). The median MPR in the adherent group and non-adherent group were 96% (IQR: 88%-98%) and 53% (IQR: 0%-68%), respectively ($P<0.0001$). Non-adherence was more common in patients younger than 45 years old (82.6%) when compared to patients older than 45 years old (30%; $P=0.007$). Non-adherence was more common in patients who identified as Hispanic White (83.3%) than other racial and ethnic groups (46.9%; $P=0.04$). The rate of non-adherence in CLE patients with charity funding (70%) was greater than that in patients with government or private insurance (28.6%; $P=.02$).

Adherence to oral medications was found to be suboptimal in a cohort of CLE patients at a safety net hospital, especially younger patients, patients receiving charity funding, and Hispanic White patients. To address the limitation of small sample size, we plan to expand our search to include patients seen at earlier dates and perform multivariable analyses. This data may inform targeted interventions toward improving medication adherence in CLE.

IMPACT OF CUTANEOUS VASCULITIS ON QUALITY-OF-LIFE

[1]Sarah Mann, MD; [2]Aamir Hussain, MD; [3]Anisha B. Dua, MD, MPH; [4]Angelina Patrone, BA; [5]Kalen Larson, MA; [6]Peter A. Merkel, MD, MPH; [7]Robert G. Micheletti, MD, for the Vasculitis Patient-Powered Research Network

[1]Department of Medicine, University of Pittsburgh, Pittsburgh, PA

[2]Department of Dermatology, Georgetown University, Washington, DC

[3]Division of Rheumatology, Department of Medicine, Northwestern University, Chicago, IL

[4]Patient Research Partner, Philadelphia, PA

[5]Vasculitis Patient-Powered Research Network, Kansas City, MO

[6]Division of Rheumatology, Department of Medicine, and Division of Epidemiology, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania, Philadelphia, PA

[7]Departments of Dermatology and Medicine, University of Pennsylvania, Philadelphia, PA

Email: robert.micheletti@pennmedicine.upenn.edu

Cutaneous manifestations of vasculitis can cause itching, pain, and ulceration. However, the health-related quality of life (HRQoL) impact of skin vasculitis has not been systematically evaluated. Utilizing the Vasculitis Patient-Powered Research Network (VPPRN), and incorporating feedback from patient research partners, an online survey was disseminated to patients with cutaneous manifestations of vasculitis (all major types), including validated measures of skin-related HRQoL (Skindex-29) and general health and wellbeing (SF-36). Skindex-29 results were categorized using previously published methods, and SF-36 scores of 50 on a scale of 0-100 were considered “average.” A total of 190 complete responses were received. Of these, 107 patients had experienced active skin lesions of vasculitis within the preceding four weeks and were included for analysis. The mean HRQoL impact of skin vasculitis was considered “very severe” in every domain of the Skindex-29, including “symptoms,” “emotions,” “functioning,” and “total.” HRQoL was below average in six of the eight domains of the SF-36. Disease severity and a more recent diagnosis negatively correlated with HRQoL. Analyzed by vasculitis type, cutaneous small-vessel vasculitis had an impact on HRQoL which met or exceeded that of other types of vasculitis. Cutaneous manifestations of vasculitis are associated with diminished HRQoL across multiple domains, suggesting skin vasculitis has a significant impact on health, wellbeing, patient symptoms, and self-perception of health. These data may improve awareness of the impact of skin disease in vasculitis. Future work will evaluate changes in HRQoL resulting from successful management of cutaneous vasculitis.

AUTOIMMUNE SKIN DISEASE EXACERBATIONS FOLLOWING COVID-19 VACCINATION

Grant Sprow[1,2]; Mohsen Afarideh[1,2]; Joshua Dan[1,2]; Rui Feng[3]; Emily Keyes[1,2]; Madison Grinnell[1,2]; Josef Concha[1,2]; Victoria P. Werth[1,2]

[1]Dermatology, Corporal Michael J. Crescenz Department of Veterans Affairs Medical Center, Philadelphia, PA, United States.

[2]Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, United States.

[3]Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania, Philadelphia, PA, United States.

Email: werth@pennmedicine.upenn.edu

Vaccination against COVID-19 reduces the risk of severe COVID-19 disease and death. However, few studies have examined the safety of the COVID-19 vaccine in patients with autoimmune skin disease. We sought to determine the incidence of disease exacerbation in this population following COVID-19 vaccination as well as the associated factors. We performed a chart review of all patients seen in the autoimmune skin disease clinic of the principal investigator during the study period. All patients included for analysis were systematically and prospectively asked about COVID-19 vaccination status, manufacturers, vaccine dates, autoimmune symptoms after the vaccine, and timing of symptom onset using a standardized template as part of their visit. Demographics and autoimmune disease diagnosis were also collected. Analysis used Chi-square and Fisher's exact tests. 402 subjects were included for analysis. 85.6% of patients were fully vaccinated, with 12.9% unvaccinated and 1.5% partially vaccinated. 14.8% of fully vaccinated patients reported worsening autoimmune signs and symptoms after the vaccine. Fully vaccinated dermatomyositis patients were more likely to report worsening autoimmune signs and symptoms after the vaccine (22.7%) than fully vaccinated lupus erythematosus patients (8.6%) (p=0.009). Patients fully vaccinated with the Moderna vaccine trended towards an increased likelihood of reporting worsening autoimmune signs and symptoms after the vaccine (19.1%) than those with the Pfizer-BioNTech vaccine (12.0%) (p=0.076). Of the patients who had autoimmune symptoms after vaccination, 20% had symptoms after the 1st dose, 82% after the 2nd dose, and 4% after the 3rd dose with median onset (95% confidence interval) of 7 (2,14), 14 (14,21), and 18 (7,28) days later, respectively. In conclusion, more fully vaccinated dermatomyositis patients had exacerbation of autoimmune signs and symptoms after the vaccine than fully vaccinated lupus erythematosus patients. However, given the risks of COVID-19, clinicians should still promote vaccination in most patients with autoimmune skin disease.

Oral Presentations

SCLEROSING DISORDERS

SINGLE-CELL RESOLUTION OF MORPHEA SKIN GENE EXPRESSION REVEALS INFLAMMATORY FIBROBLASTS DOMINATED BY CXCL9

Henry W. Chen, BS[1], Benjamin A. Nanes, MD, PhD[1,2], Giffin Werner, BS[3], Kathryn S. Torok, MD[3], Heidi T. Jacobe, MD, MSCS[1]

[1]University of Texas Southwestern Medical Center, Department of Dermatology, Dallas, TX

[2]University of Texas Southwestern Medical Center, Lyda Hill Department of Bioinformatics, Dallas, TX

[3]Children's Hospital of Pittsburgh, Division of Rheumatology, Department of Pediatrics, University of Pittsburgh, Pittsburgh, PA

Email: Heidi.Jacobe@UTSouthwestern.edu

To date, no study has examined the transcriptional landscape of pediatric morphea, a disorder of the skin and underlying tissue that severely affect children, at single-cell resolution. Thus, we analyzed 6 pediatric and 8 adult morphea skin samples against 14 healthy age- and sex-matched skin samples (healthy pediatric, n=6; healthy adult, n=8). Unsupervised clustering and subsequent annotation revealed 43,531 cells comprised of 17 major cell types in total. We performed differential expression analysis using edgeR and the likelihood-ratio test of pseudo-bulk transformed data with subsequent functional enrichment analysis of differentially expressed genes (as defined by log-fold change (logFC) >=1 and $p_{adj}<0.05$) using Gene Ontology biological process and molecular function gene set annotations. In the top twenty gene sets of adult morphea, we found a high frequency of inflammatory gene sets including immune system process ($p_{adj}=10^{-42}$) and defense response ($p_{adj}=10^{-20}$). However, within the top twenty gene sets of pediatric morphea, we observed more proliferative gene sets such as tissue development ($p_{adj}=10^{-16}$) and cell population proliferation ($p_{adj}=10^{-15}$). CXCR3 chemokine receptor binding was upregulated in fibroblasts in both adult and pediatric morphea skin (adult: $p=10^{-3}$; pediatric: $p=10^{-4}$) and underscored by increased *CXCL9* (adult: logFC=4.55, $p_{adj}=10^{-7}$; pediatric: logFC=4.76, $p_{adj}=10^{-4}$) and *CXCL10* (adult: logFC=3.23, $p_{adj}=10^{-5}$; pediatric: logFC=3.74, $p_{adj}=10^{-4}$) expression. We observed similar CXCR3 chemokine-related gene signatures in monocytes/macrophages, vascular endothelial cells, basal keratinocytes, and proliferating keratinocytes of pediatric and adult morphea skin. We detailed the transcriptional landscape of pediatric morphea at unprecedented resolution. These findings strengthen the rationale for targeting inflammatory pathways for treating morphea.

QUANTIFYING SKIN STIFFNESS IN CUTANEOUS FIBROSING DISORDERS: A NOVEL CONSTRUCTIVE SHEAR WAVE INTERFERENCE ULTRASOUND TECHNOLOGY

Morgan E Belina[1], Cindy Green[2], Beiyu Liu[2], Petek Sener[3], Peter Hollender[3], Adela R Cardones[4]

[1]Duke University School of Medicine, Duke University Medical Center, Durham, NC, USA
[2]Department of Biostatistics and Bioinformatics, Duke University, Durham, NC, USA

[3]MicroElastic Ultrasound Systems, Durham, NC, USA

[4]Department of Dermatology, University of Kansas Medical Center, Kansas City, KS, USA

Email: morgan.belina@duke.edu

There is a critical need for objective, sensitive, and reproducible methods to evaluate skin sclerosis in individuals with fibrotic skin conditions. Constructive Shearwave Interference (CSI) is a novel ultrasonic method for noninvasive characterization of skin elasticity; the tool uses a cylindrical source to generate constructively interfering shear waves in the target medium. The speed at which the shear waves propagate is directly proportional to local tissue stiffness, with stiffer areas of tissue exhibiting faster shear wave speed (SWS). In previous studies, shear wave measurement has been found to be a sensitive, reproducible method of evaluating skin sclerosis. We report here initial results from an Institutional Review Board-approved, noninterventional, prospective study to evaluate the utility of CSI in quantifying skin stiffness in patients with cutaneous fibrosing disorders as well as healthy volunteers. We obtained CSI measurements from 37 individuals with chronic graft-versus-host disease (16), systemic scleroderma (3), morphea (3), other fibrosing disorders (2), patients with prior bone marrow transplant but no cutaneous disease (3), and healthy volunteers (10). Prior to imaging, each patient was evaluated by a dermatologist with expertise in fibrosing skin disorders, and each skin site imaged received a Clinical Sclerosis Score (CSS) ranging from 0 to 3. Analysis of the CSI measurements demonstrated a significant, positive correlation between SWS and CSS ($p<0.001$). Of note, there was no correlation between average dermal thickness determined by standard B-mode ultrasound and CSS. Dermal thickness was also evaluated on histology for 15 patients. These findings suggest that CSI provides objective, quantitative measurements of skin properties that align with clinical scoring. CSI is a promising new technology for portable, noninvasive, and objective assessment of skin sclerosis in patients with cutaneous fibrosing disorders.

BONE DENSITY AND FRACTURE HISTORY IN LINEAR MORPHEA: A RETROSPECTIVE REVIEW

Maha Kazmi1, Bianca Obiakor2, Winnie Fan2, Rebecca Jacobson1, Jocelyn Gandelman1, Anna Haemel1

1Department of Dermatology, University of California, San Francisco, San Francisco, CA
2University of California, San Francisco School of Medicine, San Francisco, CA

Email: maha.kazmi@ucsf.edu

Linear morphea of the extremities may lead to skeletal complications such as limb length discrepancy or joint contractures, particularly in children. However, little is known about the impact of linear morphea on bone density in adults, where decreased weight bearing on the affected limb(s), cumulative corticosteroid exposure, and age may compound each other, with an attendant increased local fracture risk. To expand our understanding of this issue, we retrospectively reviewed records of all 27 adult patients with linear morphea of the limb(s) seen within the University of California, San Francisco Department of Dermatology between 2015-2022. The study population included 25 (92.6%) females and 13 (48.1%) non-white patients, with an average age of 31.4 years. Seventeen of 27 patients (63.0%) reported disease onset before age 18. Eleven (40.7%) patients had received systemic steroids for active morphea within the study period. Overall, 4 (14.8%) patients were noted to have fracture(s) of an extremity, and 3 of these 4 (75%) had fracture(s) of a morphea-affected limb; none of these four patients received systemic steroids within 6 months of fracture. The average age of patients with extremity fracture(s) was 21 years. Overall, three of the 27 (11.1%) patients had a documented bone density (DEXA) scan during the study period, including 2 patients with DEXA data available for both morphea-affected and unaffected lower extremities; in both these cases DEXA demonstrated lower bone density of the morphea-affected vs. unaffected limb, with only the affected limb decreasing into the osteopenic range. While limited by small sample size, these fracture and DEXA data may suggest a trend toward greater fracture risk in morphea-affected limbs in adults, indicating that assessing and optimizing bone health may be

SILENT SINUS SYNDROME: A RARE CAUSE OF FACIAL ASYMMETRY AND POTENTIAL MIMICKER OF PARRY-ROMBERG SYNDROME

Dolly Taiwò, MD[1], Duy C. Tran, MD[1], Michelle C. Juarez, MD[1], Jill T. Shah, BA[1], Lavanya Mittal, MD[1], Avrom S. Caplan, MD[1], Alisa N. Femia, MD[1], Kristin Lo Sicco, MD[1], Daniel R. Mazori, MD[1]
1 The Ronald O. Perelman Department of Dermatology, NYU Langone Health, New York, NY, USA

Email: daniel.mazori@nyulangone.org

Silent sinus syndrome (SSS) is a rare cause of adult-onset facial asymmetry primarily described in the otolaryngology and ophthalmology literature. In SSS, patients develop clinical findings including unilateral hypoglobus, or inferior displacement of one eye, due to chronic asymptomatic inflammation within a hypoplastic maxillary sinus. Although characteristic of SSS, hypoglobus may also occur in Parry-Romberg syndrome (PRS), posing a potential diagnostic challenge in the dermatology-rheumatology clinic. We present the case of a 47-year-old woman with facial asymmetry who was referred due to concern for PRS, but was ultimately diagnosed with SSS in the setting of congenitally hypoplastic facial bones. Upon presentation, the patient reported a lifelong history of facial asymmetry that had worsened in the preceding years. She denied symptoms of sinusitis. Physical examination was significant for right hypoglobus and decreased prominence of the right zygoma and right nasolabial fold. Features typically seen in PRS, including involvement of a tear trough, nasal ala, or oral commissure, were absent. Computed tomography (CT) revealed opacification of a hypoplastic right maxillary sinus, which is radiologically diagnostic of SSS. In addition, magnetic resonance imaging (MRI) demonstrated hypoplastic right facial bones with preserved subcutaneous fat and muscle, consistent with isolated congenital bony hypoplasia. MRI was also negative for soft tissue enhancement, further arguing against PRS. The patient underwent sinus surgery to improve maxillary sinus drainage and prevent further hypoglobus from SSS. Serial post-operative clinical photography showed stable facial architecture. Additionally, follow-up CT and MRI demonstrated an aerated and stably hypoplastic right maxillary sinus, stable hypoplasia of the right facial bones, and continued soft tissue symmetry without enhancement. Although well-known among otolaryngologists and ophthalmologists, SSS may be less commonly considered by dermatologists when evaluating patients with facial asymmetry. Our presentation of this case seeks to increase awareness of SSS in the dermatology-rheumatology clinic.

Teaching Point: Silent sinus syndrome is a rare cause of facial asymmetry that may mimic Parry-Romberg syndrome but can be distinguished clinically and radiologically.

ADVANCED MAGNETIC RESONANCE IMAGING AND 3D STEREOPHOTOGRAMMETRY IN CRANIOFACIAL MORPHEA PATIENTS WITH NEUROLOGICAL INVOLVEMENT

Shannon Teaw BS[1], Michael Nemeh BS[1], Tatum Moog BS[2], Darin Okuda MD[2], Heidi T. Jacobe MD MSCS[1]

[1]Department of Dermatology, University of Texas Southwestern Medical Center, Dallas, Texas

[2]Department of Neurology, University of Texas Southwestern Medical Center, Dallas, Texas

Email: Shannon.teaw@utsouthwestern.edu

Neurologic manifestations of morphea have not been well studied. Critical knowledge gaps hindering patient care include the demographic and clinical findings associated with the presence of neurological and brain imaging changes. The objective of this pilot study was to prospectively determine the clinical, demographic, and radiologic characteristics of neurologic involvement in morphea patients using advanced Magnetic Resonance Imaging (MRI).

Adult patients with linear morphea affecting the head and neck with previous neuroimaging abnormalities (N=5) were recruited from the Morphea in Adults and Children (MAC) Cohort Registry and received standardized neurologic and dermatologic exams. Imaging studies were performed using a 3T MRI scanner. The average age of onset of morphea was 33 years, and all participants had linear cutaneous lesions of the head. The median LoSAI score (for disease activity) and PGA-A (Physician Global Assessment for disease Activity) were both 0, and median LoSDI score (for disease damage) and median PGA-D (Physician Global Assessment for disease Damage) was 5 (5, 7) and 24 (21, 37), respectively. The median EDSS score (Expanded Disability Status Scale for neurologic disability) was 3.5 (3.5, 3.5). Neurological symptoms were present ipsilateral to cutaneous morphea lesions. There is little correlation between EDSS score and dermatologic scores for disease activity or damage, emphasizing that neurologic symptoms can present regardless of morphea depth and activity. Preliminary analysis of the advanced brain images shows white matter changes consistent with microvascular disease that are unexpected in this group of patients (based on age and overall health status). Brain lesions were present in areas underlying the cutaneous lesions. Clinical neurological manifestations were mild, despite brain changes on advanced imaging. Furthermore, severity and activity of skin changes of morphea were not associated with the presence or severity of brain lesions.

EVALUATING THE STANDARD OF CARE FOR PATIENTS ON BIOLOGIC THERAPY: THE VALUE OF ANNUAL TUBERCULOSIS TESTING

Madison N. Kist, BS[1]; Ryan Svoboda, MD[2]; Steven Maczuga, MS[3]; Galen T. Foulke, MD[3], and Matthew F. Helm, MD[3]
1 The Pennsylvania State University College of Medicine, Hershey, PA, USA
2 Department of Dermatology, UMass Memorial Medical Center, Worcester, MA
3 Department of Dermatology, Penn State Milton S. Hershey Medical Center, Hershey, PA, USA
Email: mkist@pennstatehealth.psu.edu

Biologic agents have been increasingly used for numerous dermatologic conditions. The standard of care for patients taking biologics includes annual screening for tuberculosis (TB) infection, as these medications can increase TB reactivation risk. TB seroconversion has been shown to be a rare event in this population. This study aims to evaluate the utility of annual TB testing in patients on biologics by determining rates of positive TB tests and costs of testing.

A retrospective claims analysis of adults on biologic therapy in the US between January 1, 2005, and December 31, 2018, was performed using the IBM® MarketScan® Commercial Database. We defined the population of patients with TB as those with a positive TB test in a given year who were prescribed treatment for TB that year or the year after the positive test. All costs were adjusted for inflation.

872,621 individuals in the database were prescribed a biologic between 2005 and 2018. The percentage of individuals on biologic therapy who were TB tested increased from 10.30% in 2005 to 39.00% in 2018. The percentage of those tested who received a positive result decreased from 2.80% in 2005 to 0.74% in 2018. The average number needed to test to receive one positive TB test was 83. The average annual cost of TB tests was $97,204.89 USD for PPD and $864,744.89 USD for QFGT. The average total cost of care one year post-first TB diagnosis ($501,912.94 USD) was much lower than the average cost of both types of TB testing combined ($961,949.78 USD).

TB seroconversion is rare for patients on biologics, and testing is costly to the healthcare system. This study indicates that the standard of care for patients on biologic therapy should be reconsidered, and that TB screening should be reserved for patients on biologics who are identified as high-risk.

Oral Presentations

DERMATOMYOSITIS

UVB-INDUCED TYPE-I INTERFERON IN KERATINOCYTES IS ASSOCIATED WITH INFILTRATION OF CXCL13+ T PERIPHERAL HELPER CELLS IN DERMATOMYOSITIS SKIN

Khashayar Afshari [1], Nazgol Sadat Haddadi [1], Yuqing Wang [1], Jane Chuprin [1], Jillian Richmond [1], Ruth Ann Vleugels [2], Manuel Garber[1], and Mehdi Rashighi [1].

[1]UMass Chan Medical School, Worcester, MA, USA,

[2]Harvard Medical School, Boston, MA, USA.

Email: Mehdi.Rashighi@umassmed.edu

Dermatomyositis (DM) is a rare autoimmune disease that presents with chronic rash and photosensitivity. Type I interferons (IFN-Is) are expressed in lesional (L) DM skin, suggesting their role in disease pathogenesis. Using single-cell RNA sequencing (scRNASeq) and flow cytometry we found a distinct population of CXCR5-, $PD1^{high}$ $CD4_+$ peripheral T helper cells (Tph) that expressed CXCL13 only in L skin of DM. ELISA on interstitial skin fluid from L DM skin confirmed elevated CXCL13 protein ($p<0.001$), and IHC highlighted strong CXCL13 staining on perivascular CD4+ T cells. Spatial transcriptomics on L DM skin revealed a robust IFN-I response in keratinocytes (KCs) and T cells in the papillary dermis, and scRNASeq confirmed a strong IFN-I signature on Tph cells, suggesting they are influenced by high expression of type I IFNs. Notably, CD4+ T cells from DM blood expressed a higher level of CXCL13 compared to those from healthy when treated with IFNs, *in vitro* ($p<0.01$). Further, primary human KCs from DM skin exhibited an aberrant IFN-I expression in response to UVB, *in vitro* ($p<0.01$), and a single acute dose of UVB on unaffected skin of a DM patient led to the infiltration of CXCL13+ T cells, similar to what was present in L skin. While there were no B cells in L DM skin, we found a distinct subset of CXCR5+ CD8+ T cells in both blood and skin, suggesting CXCL13 as a mechanism to recruit cytotoxic T cells to the skin. These findings propose a previously unknown role for IFN-I/CXCL13 axis in DM pathogenesis and its potential contribution to UVB photosensitivity where a pathologically enhanced UVB-induced IFN-I expression in DM KCs induces high CXCL13 secretion from Tph cells, which in turn promotes the recruitment of cytotoxic CXCR5+ CD8+ T cells to the inflamed skin.

IVIG does not significantly increase the risk of venous thromboembolism in dermatomyositis

Authors: Elizabeth T Rotrosen, AB;[1,2] Omid Zahedi Niaki, MD;[2,3] Bina Kassamali, MD; [2,3] Sarah Lonowski, MD; [2,3] Neda Shahriari, MD; [2,3] Avery LaChance, MD, MPH; [2,3] Ruth Ann Vleugels, MD, MPH, MBA[2,3]

Affiliations:

1: Boston University School of Medicine

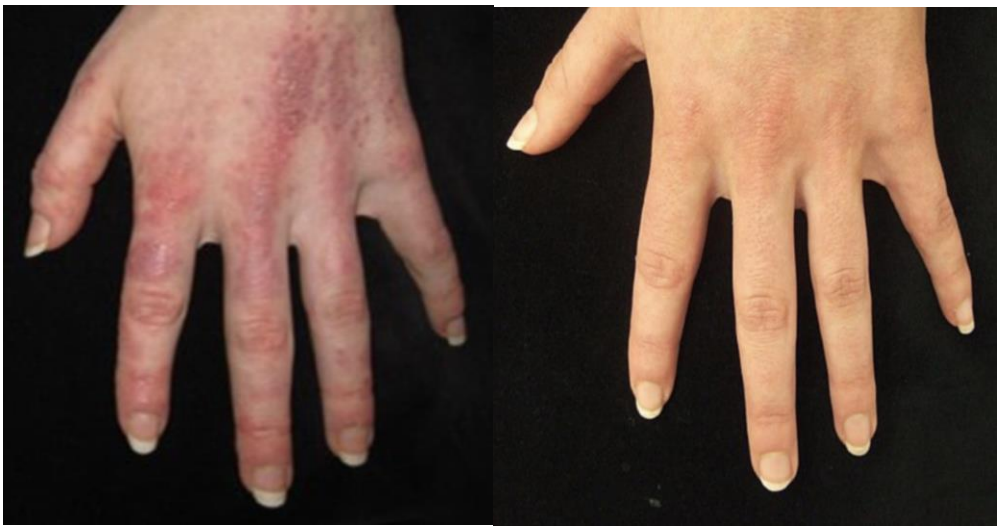
2: Brigham and Women's Hospital Department of Dermatology

3: Harvard Medical School

Corresponding author: Ruth Ann Vleugels, email: rvleugels@bwh.harvard.edu

Dermatomyositis (DM) is an autoimmune myopathy characterized by inflammatory and degenerative changes of the skin and muscles. A 2018 meta-analysis and a population-based study demonstrated that DM is associated with an increased risk of venous thromboembolism (VTE) (1, 2). Recalcitrant DM often responds to intravenous immunoglobulin (IVIG), which was FDA approved for DM in July 2021, but carries a black-box warning for increased risk of thrombosis (3, 4). We investigated the relationship between treatment of DM with IVIG and DM-associated VTE, previously defined as VTEs occurring within 24 months of DM onset (2). Previous studies on this potential association are lacking despite its relevance to clinical care. We queried the Research Patient Data Registry of Mass General Brigham using DM-related ICD 9/10 codes and terms. Demographics, clinical features, and treatment data were collected and analyzed, with *P* values $\leq .05$ considered statistically significant. 978 patients were identified, 458 had confirmed DM. 76% were female, 82% white, 5% black, 4% LatinX, and 4% Asian. Of the 458 patients with DM, 178 (39%) received IVIG for a mean of 32.9 months. 22 patients experienced DM-associated VTEs. 6 patients (3.4%) treated with IVIG experienced DM-associated VTEs, 5 of whom had other risk factors for VTE, including 4 with malignancy. 16 patients who did not receive IVIG experienced DM-associated VTEs (5.7%). We found no significant difference in the incidence of DM-associated VTEs between patients treated with IVIG compared to those who were not (p=0.167). To our knowledge, our study is the largest analysis to investigate the relationship between IVIG use in DM and VTEs. Our data adds new insights that allow physicians to consider the safe use of IVIG in DM. Limitations of this study include its retrospective methodology. Further investigation in prospective studies is warranted to better assess the risk of VTE in DM.

Figure 1. Dorsal hand of a patient with dermatomyositis before (left) and after (right) treatment with IVIG.



1.Li Y, Wang P, Li L, Wang F, Liu Y. Increased risk of venous thromboembolis associated with polymyositis and dermatomyositis: a meta-analysis. Therapeutics and Clinical Risk Management. 2018;Volume 14:157-6.

2.Carruthers EC, Choi HK, Sayre EC, Aviña-Zubieta JA. Risk of deep venous thrombosis and pulmonary embolism in individuals with polymyositis and dermatomyositis: a general population-based study. Annals of the Rheumatic Diseases. 2016;75(1):110-6.

3.Administration FaD. FDA approval letter for IVIG in use of Dermatomyositis. 2021.

4.Administration FaD. Package insert - Octagam.

DEVELOPING CLASSIFICATION CRITERIA FOR SKIN-PREDOMINANT DERMATOMYOSITIS: PRELIMINARY RESULTS OF THE PROSPECTIVE VALIDATION STUDY

Josef Symon S. Concha, MD[1,2], Joseph F. Merola, MD, MMSc[3], David Fiorentino, MD, PhD[4], Jan Peter Dutz MD, FRCPC[5] , Mark Goodfield, MD[6], Filippa Nyberg, MD[7] , Beatrix Volc-Platzer, MD[8], Manubo Fujimoto, MD[9], Chia Chun Ang, MD[10], Victoria P. Werth, MD[1,2] , and the Skin Myositis Validation Group

[1] Corporal Michael J. Crescenz VAMC, Philadelphia, Pennsylvania, USA
[2] Department of Dermatology, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA
[3] Department of Dermatology, Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts
[4] Department of Dermatology, Stanford University School of Medicine, Palo Alto, California
[5] Department of Dermatology and Skin Science, University of British Columbia
[6] Department of Dermatology, Leeds General Infirmary, Leeds, United Kingdom
[7] Karolinska University Hospital, Uppsala, Sweden
[8] Department of Dermatology, Wiener Krankenanstaltenverbund, Vienna, Austria
[9] Department of Dermatology, University of Tsukuba, Tsukuba, Japan
[10] Department of Dermatology, Singapore General Hospital, Singapore

Email: werth@pennmedicine.upenn.edu

Recognizing the need to improve on current criteria, international experts in the field of rheumatologic dermatology aimed to create criteria that are valid and reliable to classify patients with dermatomyositis (DM). The DM Delphi Criteria Project produced 22 provisional clinical and laboratory items after an extensive literature search, three rounds of consensus exercises and nominal group discussions. A total of 11 centers from North America, Europe and Asia participated in this validation study. Local IRB approval and data transfer agreements were secured prior to data collection. A total of over 100 cases and controls were submitted through the REDCap database. DM cases included newly diagnosed, treatment-naïve patients, as well as patients with mild cutaneous features or with DM-specific skin features but lack the Gottron's lesions or heliotrope rash. Controls were lupus erythematosus, eczemas, psoriasis, and other miscellaneous inflammatory and autoimmune skin diseases. Candidate models will be identified using best subset logistic regression analysis, and calibration, discrimination, improvement tests, fit statistics, and clinical relevance will be considered in choosing a final model. One primary performance metric for the model is discrimination as measured by the area under the receiver operating characteristic curve (AUC). The area under the receiver operating characteristic curve (AUC) will be calculated for the chosen

model using bootstrapping, where the modeling step is repeated many times in resampled data to calculate apparent and test performance. Best subsets logistic regression analysis will be used to consider parsimonious combinations of criteria that discriminate ADM from mimickers. The final model will be converted into a nomogram or points-based scoring system for implementation in clinical settings. We aim to use these criteria as a development and internal validation project, and we are working with colleagues in IMCCP to then validate these variables externally in their larger efforts using data from a new set of cases and controls.

RISK FACTORS FOR DEVELOPING CALCINOSIS IN JUVENILE DERMATOMYOSITIS: SUBCUTANEOUS EDEMA IN INITIAL MAGNETIC RESONANCE IMAGING

Belina Yi, DO[1], Patricia Acharya, MD[2], Amit Sura, MD, MBA[2], Michal Cidon, MD[3]

[1]Division of Rheumatology, Children's Hospital Los Angeles, Los Angeles, CA
[2]Department of Radiology, Children's Hospital of Los Angeles, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA.
[3]Division of Rheumatology, Children's Hospital of Los Angeles, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA.
Email: belyi@chla.usc.edu

Calcinosis is a sequela of Juvenile Dermatomyositis (JDM) that causes significant morbidity in children. This is a case-control study at Children's Hospital Los Angeles (CHLA) studying risk factors for calcinosis in JDM, including possible association between higher intensity of subcutaneous edema in initial magnetic resonance imaging (MRI) and development of calcinosis. Retrospective data on JDM patients without calcinosis at presentation in the past 20 years with MRIs performed at the time of JDM diagnosis was obtained, excluding overlap syndrome patients. MRIs were individually evaluated by two pediatric musculoskeletal radiologists at CHLA who blindly graded the intensity of edema by 0-4 Likert scale. Inter-rater reliability was high (95%). 43 patients (14 with calcinosis and 29 without calcinosis) were identified. Subcutaneous edema score was slightly lower in calcinosis group (mean score 2.6 vs. 2.9, p=0.39), with the same median scores of 3. Calcinosis group showed younger ages of JDM symptom onset (mean age 6 vs. 8) with dominance in age group 0-5 (79% vs. 45%). Calcinosis group had a greater number of racial minorities (93% vs. 75%). Time to JDM diagnosis was longer in calcinosis group (mean days 269 vs. 112). Our study did not show the association between increased subcutaneous edema in MRIs at the time of JDM diagnosis and development of calcinosis. Younger age of disease onset, racial minority, and longer time to reach JDM diagnosis appeared to be risks for developing calcinosis in our study, consistent with previous reports. Larger cohort and prospective longitudinal studies looking at these higher risk groups are needed to identify prognostic markers for JDM calcinosis.

MULTISYSTEM VASCULOPATHY AND VASCULITIS IN DERMATOMYOSITIS PATIENTS WITH ANTI-NXP-2 ANTIBODIES

Christina Bax, MD[1*], Gabriel Molina, MD[1*], Ben Schwartz, BA[1], David Fiorentino, MD, PhD[1]

[1]Stanford University School of Medicine, Department of Dermatology, Stanford, CA

*Co-first authors

Email: Cbax2014@Stanford.edu

Abstract Category: Clinical Case

Dermatomyositis (DM) patients with autoantibodies against nuclear matrix protein 2 (NXP-2) display characteristic features, including calcinosis cutis, dysphagia, subcutaneous edema, and myalgia. In addition to this documented phenotype, our institutional experience includes a cohort of seven NXP-2 patients with multisystem vasculopathy, particularly in the skin and gut. These cases implicate a possible association between anti-NXP-2 DM and vasculopathic sequelae, which may serve as a poor prognostic indicator in select patients. We herein describe one such case of a 44-year-old woman with DM and anti-NXP-2 antibodies who developed vasculopathy of the mucocutaneous, gastrointestinal, and central nervous systems. Three years after her DM diagnosis, our patient developed new oral and perianal ulcerations following recent discontinuation of methotrexate and dapsone for adverse effects. Despite increasing prednisone dosage, she was hospitalized two months later for acute abdominal pain and fever with imaging findings concerning for perforated toxic megacolon. Following emergent total colectomy, histopathologic analysis revealed colonic medium-vessel vasculitis with mucosal erosions and mural necrosis (Figure 1). The patient was postoperatively managed with antibiotics and discharged before developing new superficial ulcerations with erythematous borders on the dorsal hands (Figure 2). Punch biopsy revealed fibrin thrombi in multiple small vessels and a focus of leukocytoclastic vasculitis (Figure 3). Following an unrevealing hypercoagulability work-up, azathioprine was added to her regimen of hydroxychloroquine, intravenous immunoglobulin, and prednisone, and the patient's disease was stably managed for several years. Five years later, she presented to the emergency department with altered mental status and was found to have an acute infarct of the left globus pallidus, favored to be secondary to cerebral small-vessel ischemic changes, which had notably been radiologically visualized even during her prior hospitalization for colonic perforation. She has since made a full clinical recovery and her DM remains well-controlled.

Teaching Point: Maintaining a high index of suspicion for vascular complications in dermatomyositis patients with anti-NXP-2 autoantibodies is critical for prompt recognition and early intervention of these highly morbid and potentially life-threatening multisystem sequelae.

Figure 1. Histopathology of resected colon

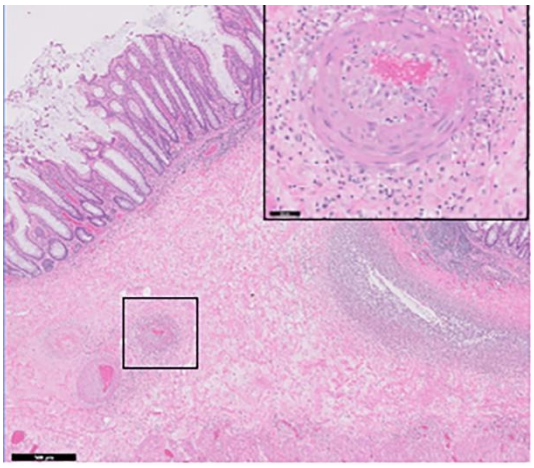


Figure 2. Right dorsal hand ulcer

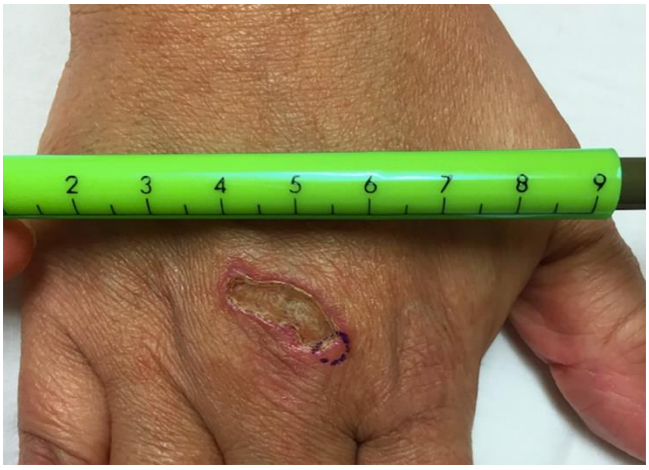
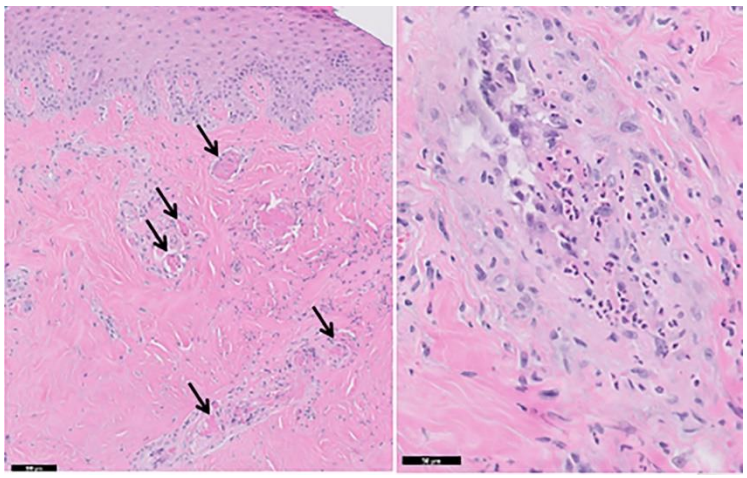


Figure 3. Right dorsal hand skin biopsy



"RING AROUND THE MUSCLE" – ISOLATED FASCIITIS AS A PRESENTING SIGN OF DERMATOMYOSITIS

Dustin Taylor[1], Katharina Shaw[1], Stephanie Sanchez-Melendez[1,2] *Ruth Ann Vleugels[1], *Lisa Christopher-Stine[3]

[1]Department of Dermatology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA

[2]Ponce Health Sciences University, School of Medicine, Ponce, Puerto Rico

[3]Division of Rheumatology, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

*represent co-senior authors

Email: dtaylor24@bwh.harvard.edu

A 70-year-old woman presented with a 6-month history of an asymptomatic eruption overlying the knuckles and knees. She also noted a new pruritic eruption affecting the scalp with associated hair loss. More recently, she developed subtle weakness, most notable when attempting to climb the stairs at her home. Examination revealed violaceous papules and plaques overlying the proximal interphalangeal joints, distal interphalangeal joints, elbows, and knees, along with scaly, erythematous patches on the occipital scalp. She had no evidence of cutaneous sclerosis. Upper and lower extremity proximal strength was 4/5. Muscle enzyme levels were within normal limits. A clinical diagnosis of dermatomyositis was made based on classic physical examination. MRI of the thighs identified diffuse, bilateral, symmetric fascial edema, with minimal to no intramuscular edema. Peripheral blood eosinophils were within normal range, and comprehensive myositis antibody panel is pending. MRI in dermatomyositis typically reveals varying patterns of intramuscular hyperintensity representing active inflammation and edema. However, early disease can present as isolated fascial hyperintensity, consistent with fascial microvasculature inflammation and damage.[1,2] We propose calling these cases of pan-fascial edema and fasciitis "ring around the muscle." Importantly, this disease phenotype could explain why a cohort of patients with otherwise classic dermatomyositis lack pathologic evidence of myositis.

Teaching point: Isolated fasciitis has been described as an early finding in dermatomyositis. Physical examination is accordingly vital in distinguishing from radiologic confounders such as eosinophilic fasciitis.

1.Allen E, Schmahmann S, Sauser D, Barkhuizen A. Fasciitis in amyopathic dermatomyositis. J Clin Rheumatol. 2003 Feb;9(1):51-3. doi: 10.1097/01.RHU.0000049716.25111.AF. PMID: 17041424

2.Yoshida K, Kurosaka D, Joh K, Matsushima S, Takahashi E, Hirai K, Noda K, Ukichi T, Furuya K, Yanagimachi M, Kingetsu I, Fukuda K, Yamada A. Fasciitis as a common lesion of dermatomyositis, demonstrated early after disease onset by en bloc biopsy combined with magnetic resonance imaging.

SPIRULINA ACTIVATES IFNγ AND TNFα VIA TLR4 AND TBK1 IN DERMATOMYOSITIS SKIN AND PERIPHERAL BLOOD

DeAnna Diaz[1,2]; Thomas Vazquez[1,2]; Christina Bax[1,2]; Jay Patel[1,2]; Madison Grinnell[1,2]; Emily Keyes[1,2]; Yubin Li[1,2]; Julianne Kleitsch[1,2]; Rohan Dhiman[1,2]; Victoria Werth[1,2]

[1] Corporal Michael J. Crescenz VA Medical Center, Philadelphia, PA, USA

[2] Department of Dermatology, University of Pennsylvania, Philadelphia, PA, USA

email: werth@pennmedicine.upenn.edu

Our group has previously shown that Spirulina, a popular herbal supplement with purported immune boosting effects, is temporally associated with dermatomyositis (DM) onset and flare. Here, we sought to identify which cells and inflammatory pathways are activated as a result of Spirulina stimulation in DM patients both in blood and skin. We utilized multiplexed flow cytometry on DM patient PBMCs stimulated with 0.3mg/mL of Spirulina on eight cell lineages. When evaluating % change in activation with 0.3 mg/ml of Spirulina in DM, monocyte-derived DCs (moDCs) and classical monocytes (CMs) had a significantly greater % increase in CMs and moDCs in DM compared to all the cell lineages. MFI of IFNγ$^+$ CMs increased 39-fold after 0.3 mg/ml Spirulina stimulation ($p<0.0001$), with TLR4 inhibition reducing Spirulina's effect by two-thirds ($p<0.0001$). TLR4 inhibition significantly decreased the percent of Spirulina-induced moDCs producing IFNγ ($p<0.01$). When evaluating TNFα activity from PBMCs, there was a significant increase in the percent of moDCs ($p<0.001$) and activated CMs ($p<0.0001$) in DM PBMCs when stimulated with 0.3 mg/mL Spirulina. TLR4 inhibition significantly decreased Spirulina-stimulated TNFα$^+$ moDCs ($0<0.01$) and CMs ($p<0.05$). In addition, TNFα$^+$ moDCs also significantly decreased with TBK1 inhibition ($p<0.05$).

We then performed imaging mass cytometry on lesional DM skin from patients with new-onset DM and a clear history of novel Spirulina consumption immediately preceding onset of disease (Spir-DM). Unsupervised clustering of dermal cells using the Phenograph algorithm yielded 14 unique cell types. There was overlap of CD11c$^+$, CD14$^+$, and IFNγ$^+$ cells in Spir-DM skin, supporting an important role for moDCs and CMs in the production of IFNγ. Our data suggest that Spirulina may promote autoimmunity via production of IFNγ and TNFα in moDCs and CMs in both the blood and skin, thereby implicating Spirulina in the development of DM in some susceptible patients.

ASSOCIATION BETWEEN INTERSTITIAL LUNG DISEASE AND PRIOR METHOTREXATE EXPOSURE IN DERMATOMYOSITIS

Jill T. Shah[1], Lavanya Mittal[1], Rochelle Castillo[2], Daniel R. Mazori[1], Avrom Caplan[1], Alisa Femia[1]
[1]Ronald O. Perelman Department of Dermatology, New York University Langone Health, New York, New York
[2]Division of Rheumatology, Department of Medicine, New York University Langone Health, New York, New York

Email: Alisa.Femia@nyulangone.org

A potential complication of dermatomyositis (DM) is interstitial lung disease (ILD). Methotrexate (MTX) is a commonly utilized first-line systemic agent for DM, but a paucity of literature exists regarding ILD risk in MTX-treated patients. Moreover, MTX has been associated with a risk of pneumonitis and/or pulmonary fibrosis in the rheumatoid arthritis population, leading to possible hesitation regarding its use as DM disease-modifying therapy. To better delineate the relationship between MTX and ILD in DM patients, we designed a retrospective case-control study to identify all patients with DM diagnoses recorded >1 week apart within the NIH's *All of Us* Research Program. Patients were divided by ILD status into an ILD group and a No-ILD group. We then examined for differences amongst these two groups regarding odds of MTX exposure (prior to ILD development in the ILD group). Exclusion criteria included first MTX exposure <2 years prior to the end of data collection (to allow for sufficient time for MTX-associated ILD detection). We identified 145 DM patients (No-ILD: n=93; ILD: n=52). Mean time from DM diagnosis to MTX initiation was 1.5±4.2y, to ILD diagnosis in MTX-exposed was 4.5±5.3y, and to the end of data collection was 7.5±5.5y. Between No-ILD and ILD groups, there were no significant differences in follow-up time, sex, race/ethnicity, smoking, DM-associated malignancy, and prior exposure to mycophenolate mofetil/mycophenolic acid, rituximab, and azathioprine (all p>0.25). Age trended towards significance (p=0.074). In age-adjusted logistic regression analysis, No-ILD individuals had significantly higher odds of prior methotrexate exposure as compared to ILD individuals (p=0.043, OR 2.22, 95% CI 1.05-4.96). Although IVIG exposure was different between groups (p=0.036), No-ILD patients maintained significantly greater odds of prior methotrexate exposure (p=0.04) in a sensitivity analysis removing IVIG-exposed patients. This is the first DM study suggesting MTX exposure may protect against ILD development. Our study is limited by its retrospective design, lack of ability to determine causation, and lack of DM subtype data. Prospective studies are warranted to validate ILD risk amongst MTX-treated DM patients.

CURRENT MANAGEMENT OF THE HEIGHTENED RISK FOR ATHEROSCLEROTIC CARDIOVASCULAR EVENTS IN PATIENTS WITH DERMATOMYOSITIS (DM)

Authors: Megan Zhao, BA[1,2], Kevin Jon Williams, MD[3], Rui Feng, PhD[4], Victoria P Werth, MD[1,2]

[1] Corporal Michael J. Crescenz Veterans' Administration Medical Center, Philadelphia, PA, USA
[2] Department of Dermatology, University of Pennsylvania, Perelman School of Medicine, Philadelphia, PA
[3] Department of Cardiovascular Sciences, Department of Medicine, Lewis Katz School of Medicine at Temple University, Philadelphia, PA
[4] Department of Biostatistics, University of Pennsylvania, Perelman School of Medicine
Email: megan.zhao@pennmedicine.upenn.edu

Category: Dermatomyositis

Patients with dermatomyositis (DM) are at a heightened risk for clinical events, chiefly heart attacks and strokes, caused by atherosclerotic cardiovascular disease (ASCVD). To address this problem, we recently proposed new guidelines for categorization of levels of risk for future ASCVD events specifically in DM patients, with corresponding recommendations for management of conventional therapeutic targets, chiefly hypercholesteremia, hypertension, smoking, prediabetes, and diabetes mellitus (Keyes et al. 2021). Here, we assessed current management of ASCVD event risk in an established longitudinal cohort of DM patients at UPenn (DM-ASCVD Cohort, n=70). 94.3% (66/70 patients) had a primary care physician. By the newly proposed guidelines, low-density lipoprotein (LDL) cholesterol levels were above goal for 52.9% (9/17) of DM patients classified at High Risk for an ASCVD event, 78.0% (32/41) of DM patients classified at Very High Risk, and 66.7% (8/12) of DM patients classified at Extreme Risk). Despite established approaches to manage statin-associated muscle symptoms (Keyes et al. 2021), LDL-lowering remains an issue for DM patients. Of 48 DM patients with hypertension, 41.7% (20/48) were not on any anti-hypertensive medications, and another 41.7% (20/48) were undertreated, meaning on medications yet still ≥130/80. Regarding smoking, only one patient in our DM-ASCVD Cohort (1.4%) is a current smoker, and 31.43% (22/70) are former smokers. Of the six DM patients with prediabetes, 5/6 (83.3%) had documentation of lifestyle counseling in their charts, but none had an active prescription for metformin. Of the 12 DM patients with diabetes in our Cohort, only one (8.3%) was not well-managed, defined by a glycated hemoglobin >7%. We conclude that DM patients are undermanaged for conventional therapeutic targets to reduce ASCVD event risk, particularly hypercholesteremia and hypertension. Efforts are underway to investigate impediments to guideline-based care, to allow rational strategies to improve the management of ASCVD event risk in DM patients.

THE CLINICAL PHENOTYPE ASSOCIATED WITH ANTI-PM/SCL COMPARED TO SCLEROMYOSITIS

Sabrina Saeed, BA[1], Jeffrey Gehlhausen, MD[1], Fotios Koumpouras, MD[2], Sarika Ramachandran, MD[1]

[1]Department of Dermatology, Yale New Haven Health Systems, New Haven, CT

[2]Department of Rheumatology, Yale New Haven Health Systems, New Haven, CT

Email: sarika.ramachandran@yale.edu

Anti-PM/Scl is an antinuclear antibody often associated with scleromyositis, an overlap syndrome encompassing features of systemic sclerosis (SSc) and myositis. Due to its rarity, there are limited data characterizing the clinical phenotype of anti-PM/Scl. The aim of this study was to examine the clinical features, cutaneous manifestations, and demographics associated with anti-PM/Scl in contrast to anti-PM/Scl– scleromyositis. Our analysis included patients treated at our institution between 2012 and 2022. Presence of anti-PM/Scl was detected in 34 of the 1666 patients tested, and 18 of the anti-PM/Scl– patients were determined to have scleromyositis. Differences between groups were assessed using Fisher's Exact Test and ANOVA. Mean age was significantly higher in anti-PM/Scl+ (53.2 vs. 41.2, p=.015), while both cohorts were associated with female preponderance (68.2% vs. 77.8%, non-significant (ns)) and Caucasian race (77.3% vs. 55.6%, ns). Seven anti-PM/Scl+ patients had scleromyositis, four had dermatomyositis, three had polymyositis, eight had miscellaneous overlap or connective tissue diseases, and twelve were undiagnosed and therefore excluded. Patients with anti-PM/Scl had a lower frequency of anti-Scl-70 (0.0% vs. 33.3%; p=.039), scleroderma facies (13.6% vs. 50.0%, p=.013) and sclerodactyly (22.7% vs. 61.6%, p =.014), but similar frequencies of periorbital erythema (ns), Gottron's papules (ns), heliotrope rash (ns), telangiectasias (ns), Shawl sign (ns), and mechanic's hands (ns). Anti-PM/Scl was also associated with a lower frequency of digital ulcers (4.5% vs. 33.3%, p=.017), myalgias (59.1% vs. 88.9%, p=.036), joint contractures (13.6% vs. 44.4%, p=.030), Raynaud's phenomenon (40.9% vs. 88.9%, p=.002), pulmonary hypertension (4.5% vs. 27.9%, p=.041), and lung fibrosis (14.3% vs. 50.0%, p=.039). However, no differences in malignancies (ns) or treatment response rates (ns) were observed. Anti-PM/Scl is associated with a more benign phenotype and lesser degree of pulmonary involvement compared to anti-PM/Scl– scleromyositis. Although historically associated with scleromyositis, anti-PM/Scl—in our cohort—underlies a wide spectrum of disease.

Novel Anti-Interferon-Beta Antibody for the Treatment of Anti-MDA5 Dermatomyositis with Rapidly Progressive Interstitial Lung Disease

Donglin Zhang[1], BA; Steven A. Greenberg[2], MD; Ruth Ann Vleugels[3], MD; Bridget E. Shields[4], MD.

[1]Clinical Research, Department of Dermatology, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

[2]Department of Neurology, Brigham and Women's Hospital, Boston, MA, USA

[3]Department of Dermatology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

[4]Department of Dermatology, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

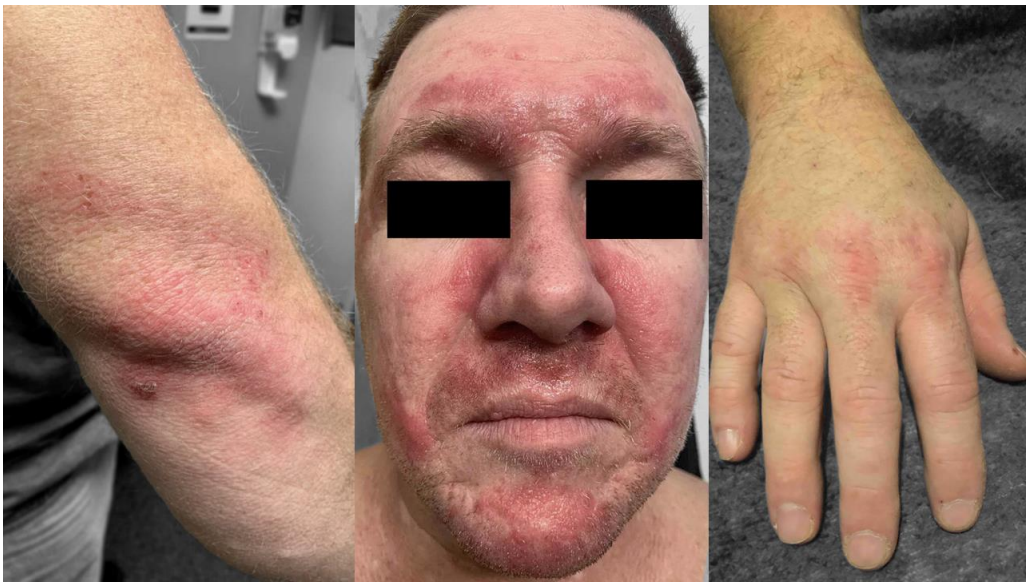
Email: dzhang@dermatology.wisc.edu

A man in his 40s developed acute hypoxemic respiratory failure 5 months after initial presentation with proximal muscle weakness, elevated ESR, ANA, aldolase, CK, and high titer anti-melanoma differentiation-associated gene 5 (anti-MDA5) antibodies consistent with anti-MDA5 dermatomyositis (DM). Treatment with multiple rounds of systemic corticosteroids, cyclophosphamide, and tacrolimus did not achieve adequate disease control. Development of deep vein thrombosis and bilateral pulmonary embolisms required cessation of tacrolimus, leading to acute worsening of pulmonary symptoms. Physical examination revealed tender violaceous macules on the palmar hands, Gottron's papules, nailfold ulcerations, and violaceous erythema of the face, neck, chest, and extensor elbows. Computed tomography demonstrated interstitial and alveolar infiltrates in a pattern consistent with autoimmune disease; pulmonary function testing (PFT) revealed diffusion capacity (DLCO)=57% predicted, forced expiratory volume over 1 second (FEV1)=58% predicted, forced vital capacity (FVC)=60% predicted, and FEV1/FVC=0.78 consistent with rapidly progressive interstitial lung disease (RP-ILD). Emergency authorization was approved for a novel anti-interferon β (anti-IFNβ) monoclonal antibody (Pfizer, PF-06823859); 600mg was administered intravenously over the course of 90 minutes. Used in conjunction with multimodal immunosuppression, anti-IFNβ therapy resulted in rapid improvement in pulmonary and cutaneous symptoms. Repeat PFT 3 weeks following treatment revealed DLCO=61%, FEV1=73% predicted, and FVC= 73% predicted. To date, the patient has received 3 anti-IFNβ infusions with sustained, significant improvement at 18 months following initial RP-ILD diagnosis. Etiopathogenesis of DM, including anti-MDA5 DM, is hypothesized to be secondary to an acquired type I interferonopathy with direct injury to tissue by type 1 interferons and an associated vasculopathy.[1,2] Despite treatment with immunosuppressive therapy, mortality approaches 80% in the first three months after RP-ILD diagnosis.[3-5] We present a case of anti-MDA5 DM with RP-ILD treated with multimodal

immunosuppressive therapy, including a novel anti-IFNβ treatment. Clinical improvement in his cutaneous and pulmonary disease supports IFNβ as an important therapeutic target.

Teaching Point: Prompt initiation of adjunct anti-IFNβ therapy in anti-MDA5 DM with RP-ILD may lead to rapid and sustained clinical improvement.

1. Ono N, Kai K, Maruyama A, et al. The relationship between type 1 IFN and vasculopathy in anti-MDA5 antibody-positive dermatomyositis patients. *Rheumatology*. 2019;58(5):786-791. doi:10.1093/rheumatology/key386
2. Greenberg SA. Dermatomyositis and type 1 interferons. *Curr Rheumatol Rep*. Jun 2010;12(3):198-203. doi:10.1007/s11926-010-0101-6
3. Nombel A, Fabien N, Coutant F. Dermatomyositis With Anti-MDA5 Antibodies: Bioclinical Features, Pathogenesis and Emerging Therapies. *Front Immunol*. 2021;12:773352. doi:10.3389/fimmu.2021.773352
4. Allenbach Y, Uzunhan Y, Toquet S, et al. Different phenotypes in dermatomyositis associated with anti-MDA5 antibody: Study of 121 cases. *Neurology*. Jul 7 2020;95(1):e70-e78. doi:10.1212/wnl.0000000000009727
5. Tsuji H, Nakashima R, Hosono Y, et al. Multicenter Prospective Study of the Efficacy and Safety of Combined Immunosuppressive Therapy With High-Dose Glucocorticoid, Tacrolimus, and Cyclophosphamide in Interstitial Lung Diseases Accompanied by Anti-Melanoma Differentiation-Associated Gene 5-Positive Dermatomyositis. *Arthritis Rheumatol*. Mar 2020;72(3):488-498. doi:10.1002/art.41105



Oral Presentations

CLINICAL CASES OF THE YEAR

Immune checkpoint-induced lichenoid dermatitis treated with dupilumab

Jonathan Park[1], Eunsuh Park[2], William E. Damsky[2,3] and Matthew D. Vesely[2]

[1]Department of Genetics, Yale School of Medicine, New Haven, Connecticut, USA.

[2]Department of Dermatology, Yale School of Medicine, New Haven, Connecticut, USA.

[2]Department of Pathology, Yale School of Medicine, New Haven, Connecticut, USA.

Email: matthew.vesely@yale.edu

Inhibitors of immune inhibitory molecules, sometimes referred to as immune checkpoints, has revolutionized cancer immunotherapy. The development of cutaneous immune related adverse events (iRAEs) in response to immune checkpoint inhibitors (ICIs) can severely impact quality of life and may result in discontinuation of cancer immunotherapy. Here we present two cases of recalcitrant ICI-induced lichenoid dermatitis successfully treated with dupilumab with ongoing ICI therapy. RNA in situ hybridization (RISH) of patient biopsies showed presence of type 2 inflammatory cytokine *IL13*, the target of dupilumab. To our knowledge, these are the first reported cases of dupilumab used to treat lichenoid dermatitis in the setting of ICI therapy. Patient 1 is a 68-year-old woman with history of seropositive rheumatoid arthritis on adalimumab, hydroxychloroquine, and intermittent prednisone. She developed pancreatic adenocarcinoma and treated with anti-programmed death 1 receptor (PD-1) pembrolizumab. She subsequently developed an extensive pruritic rash. Biopsy showed a band of lichenoid infiltrate of lymphocytes with abundant eosinophils consistent with anti-PD-1 induced lichenoid dermatitis. She was treated with acitretin 17.5 mg, topical halobetasol and prednisone, but rash and itch continued. Pembrolizumab was held due to worsening rash. The patient's biopsies showed the presence of cytokine interleukin-13 (*IL13*) by RISH. She was started on dupilumab and her rash and itch improved and was able to restart pembrolizumab. She remains on both pembrolizumab and dupilumab. Patient 2 is a 77-year-old male with metastatic clear cell renal cell carcinoma that developed lichenoid dermatitis on pembrolizumab. Treatment with topical halobetasol daily and methotrexate 12.5 mg weekly was unsuccessful. Analysis of patient's biopsies by RISH showed *IL13* staining. He was started on dupilumab and rash cleared. He remains on both pembrolizumab and dupilumab. These cases demonstrate that dupilumab is a possible therapeutic option for patients that develop lichenoid dermatitis in the setting of immune checkpoint blockade.

Teaching point: Dupilumab may be an effective therapy for anti-PD-1 induced lichenoid dermatitis.

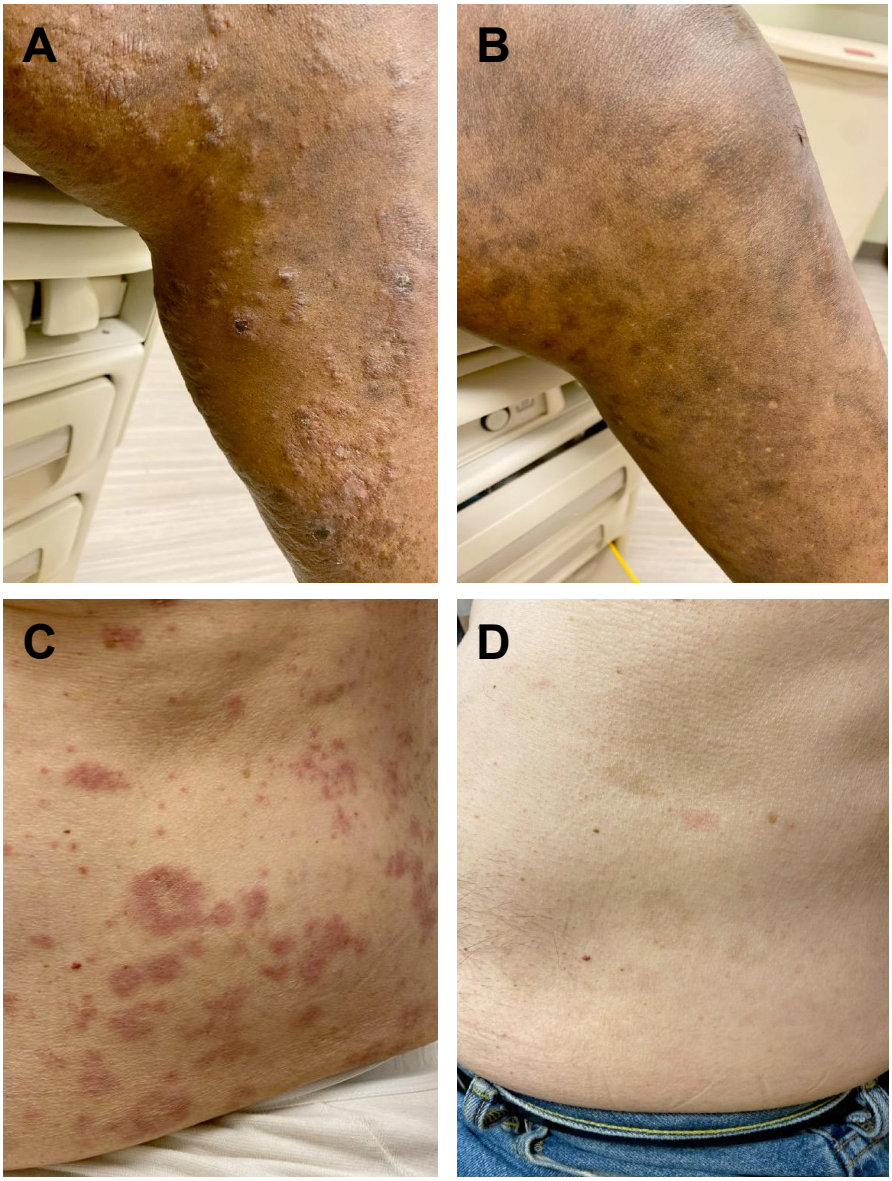


Figure: Treatment response of immune checkpoint-induced lichenoid dermatitis with dupilumab. Patient 1 before (**A**) and after (**B**) treatment with dupilumab. Patient 2 before (**C**) and after (**D**) treatment with dupilumab.

RECOGNITION AND MANAGEMENT OF A CLASSIC AUTOIMMUNE DISEASE PHENOTYPE IN A 17-MONTH-OLD

Lauren Flowers, BS[1,2*†], Stephanie Sanchez-Melendez, BS[2,3†], Sarah Lonowski, MD, MBA[2], Emilija Bielkus Strydom[2], Katharina Shaw, MD[2], Fatma Dedeoglu, MD[4], Mindy Lo, MD, PhD[4], Ruth Ann Vleugels, MD, MPH, MBA[2,5]

1. University of Missouri School of Medicine, Columbia, MO
2. Department of Dermatology, Brigham and Women's Hospital; Harvard Medical School, Boston, MA
3. Ponce Health Sciences University, School of Medicine, Ponce, Puerto Rico
4. Department of Rheumatology, Brigham and Women's Hospital; Harvard Medical School, Boston, MA
5. Department of Dermatology, Boston Children's Hospital, Harvard Medical School, Boston, MA

*Corresponding Author: LFDKD@health.missouri.edu

†Co-first authors

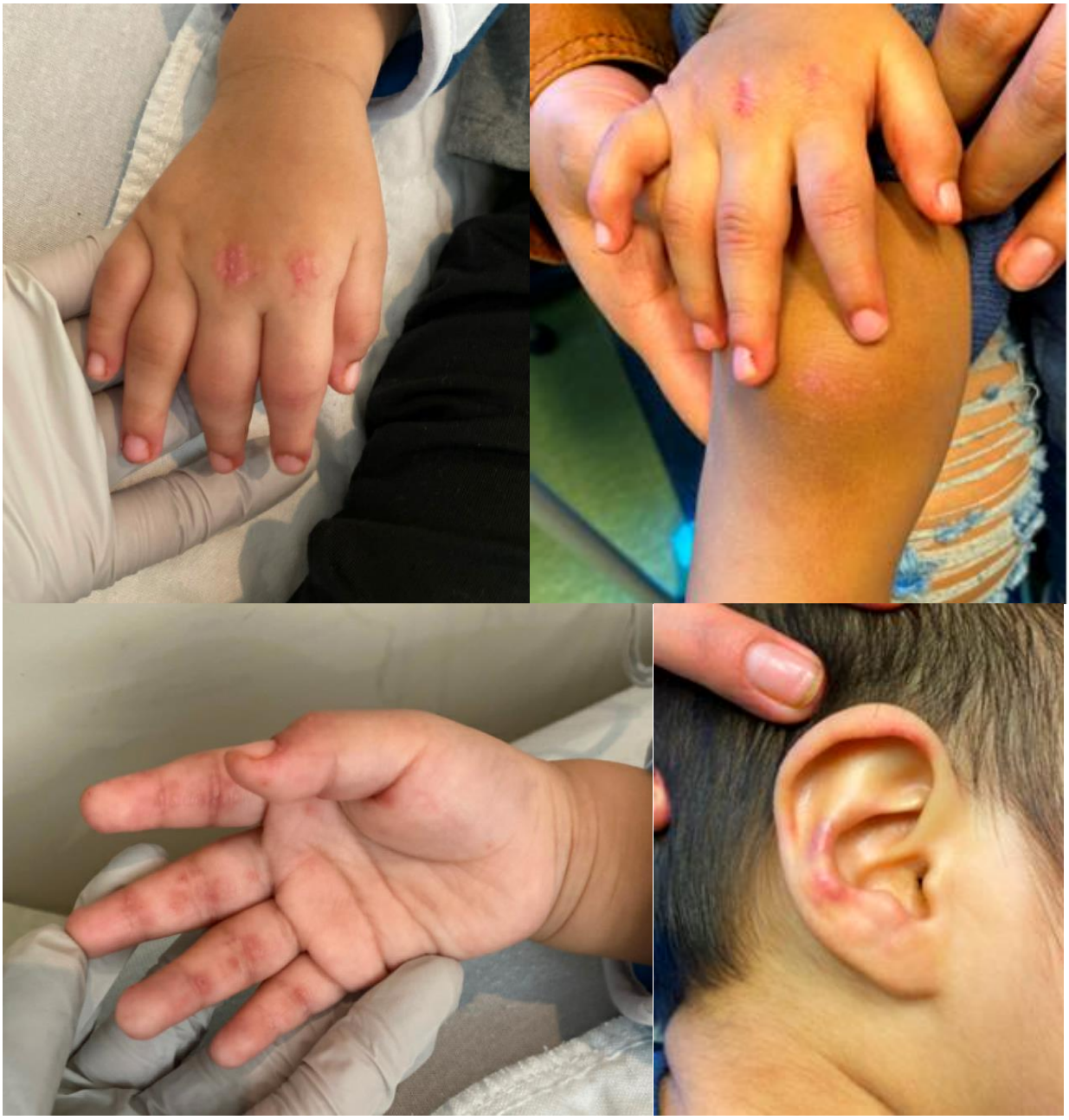
Abstract

Melanoma differentiation-associated protein 5 (MDA-5)-associated juvenile dermatomyositis (JDM) is a rare presentation in children. However, the classic phenotype initially described by Fiorentino et al. in adults with MDA-5 DM is often present, including in young patients. The MDA-5 JDM variant is characterized by vasculopathic skin lesions, inflammatory arthritis, increased risk for pulmonary involvement compared to other subtypes of JDM, and an overall worse prognosis. Muscle disease may be present more often in MDA-5 JDM compared to adult MDA-5 disease, which is very frequently amyopathic. We present a 17-month-old previously healthy male who developed a febrile illness with painful oral lesions and an eruption on his face, ears, and extremities that was initially misdiagnosed as a viral exanthem. The patient then had decreased ambulation and was diagnosed with transient synovitis at an outside hospital. He subsequently presented to Boston Children's Hospital, where we noted classic lesions of MDA-5 JDM on skin examination, including oral ulcerations, tender erythematous palmar papules and macules favoring the creases, erythematous plaques on the knees and dorsal MCP joints, hemorrhage of nailfold capillaries, and erythematous plaques over the helices and anti-helices. Prompt recognition of this phenotype led to the diagnosis, which was ultimately confirmed with positive MDA-5 antibody and elevated serum type I interferon. On evaluation, the patient also had impressive polyarthritis of the small hand joints and knees and active myositis. Mainstay JDM management includes high-dose corticosteroids combined with methotrexate, as were used in this patient in conjunction with intravenous immunoglobulin (IVIG). However, the patient's outpatient course was complicated by worsening cutaneous and joint disease, prompting the addition of the Janus kinase inhibitor (JAKi) tofacitinib 5mg twice daily to achieve disease

control. Notably, recent data have suggested that young children may metabolize JAKi differently than older patients, requiring higher doses or more frequent administration. This case of MDA-5 JDM is unique in terms of the patient's extremely young age, severe presentation, and excellent response to JAKi therapy.

Teaching Points

- MDA5 JDM is a rare variant of the JDM spectrum characterized by a characteristic cutaneous phenotype, polyarthritis, and occasionally muscle involvement; although pediatric patients with MDA-5 JDM have an increased risk of lung disease compared to other subtypes of JDM, they have a lower risk of rapidly progressive pulmonary involvement compared to affected adults.
- Specific cutaneous manifestations associated with anti-MDA5 antibodies include palmar papules and macules favoring the creases, oral ulcerations, cutaneous ulcerations over Gottron papules and sign, and papules and plaques on the antihelices and helices.
- Pharmacokinetics and pharmacodynamics of JAKi in young children is still under investigation, however, recent data have suggested that young children may metabolize JAKi differently than older patients, requiring higher doses or more frequent administration to achieve adequate disease control.



Two unique cases of interstitial granulomatous dermatitis as a presenting sign of systemic disease

Rachel Elsanadi BS,[1] Katerina Yale MD,[1] Dani Zhao MD PhD,[1] Michael Nguyen, MD PhD, [1] Nathan Rojek MD,[1] Kenneth Linden, MD PhD, [1] Di Lu MD, [2] Niral Patel MD, [3] Bonnie Lee MD,[1] Michelle Min MD MSci[1]

[1]University of California, Irvine, Department of Dermatology

[2]University of California, Irvine, Department of Pathology

[3]University of California, Irvine, Department of Medicine, Division of Pulmonology and Critical Care

Email: relsanad@hs.uci.edu

Few cases of interstitial granulomatous dermatitis (IGD) have been reported. We recount two cases of IGD with subsequent evaluation revealing underlying systemic disease. Case 1: A previously healthy 36-year-old male presented with rapidly progressive rash and painful hand swelling preceded by fever, myalgias, and fatigue. Examination revealed erythematous-to-violaceous annular plaques on the head, trunk, and extremities including palms (Fig 1a-g). Autoimmune and infectious workups returned negative. Skin biopsy revealed superficial perivascular and interstitial inflammation with lymphocytes, eosinophils, and plasma cells, as well as histiocytes between collagen bundles, consistent with IGD (Fig 2a-d). Acid-fast bacilli, Fite, and Grocott's methenamine silver stains were negative. CT revealed bilateral mediastinal lymphadenopathy. Fine-needle aspiration demonstrated necrotizing granulomas; yet, bronchoalveolar lavage remained negative for infection. Ultimately, a diagnosis of a rare pulmonary disorder, necrotizing sarcoid granulomatosis (NSG), was made.[1,2] The patient never developed respiratory symptoms. After starting prednisone and hydroxychloroquine, his rash resolved. Case 2: An 80-year-old male with history of testicular and bladder cancers in remission presented with a mildly pruritic rash involving the head, arms, and back. He reported fevers, tachycardia, weakness, and weight gain (Fig 3a-d). Labs showed anemia, hypoproteinemia, and elevated inflammatory markers. Autoimmune and infectious workups were negative. Skin biopsy was again consistent with IGD (Fig 4a-c). CT showed nonspecific, mildly enlarged lymph nodes in the mediastinum. Serum/urine protein electrophoresis and immunofixation indicated IgG monoclonal gammopathy; kappa/lambda free light-chains were significantly elevated. Bone marrow biopsy was consistent with multiple myeloma (MM). The patient was subsequently started on systemic chemotherapy (bortezomib, lenalidomide, dexamethasone) with improvement. To our knowledge, there are no previous reports of IGD presenting with NSG, and there is one reported case of IGD as the initial presentation of MM.[3,4] Overall, IGD is most associated with inflammatory arthritides but can occur with other autoimmune diseases, infection, or malignancy.[4,5] We therefore recommend extensive evaluation for underlying disease.[5]

Teaching Point: Interstitial granulomatous dermatitis (IGD) is a rare reactive skin process associated with underlying systemic disease, for which workup of autoimmune, malignant, and infectious processes must be completed; IGD may be a presenting symptom of necrotizing sarcoid granulomatosis (NSG, a rare pulmonary disorder) or multiple myeloma.

INPATIENT IVIG FOR REFRACTORY, SEVERE CUTANEOUS LUPUS ERYTHEMATOUS: A CASE SERIES

Srona Sengupta, PhD[1], Chirag Vasavda, PhD[1], and Jun Kang, MD[1]

[1] Department of Dermatology, Johns Hopkins University School of Medicine, Baltimore, MD, USA.

Email: jkang60@jh.edu

We describe a series of patients with severe cutaneous lupus erythematosus (LE) requiring hospitalization and refractory to significant immunosuppression, whose symptoms improved with intravenous immunoglobulin (IVIg). Case 1: 61-year-old female with cirrhosis and Hepatitis C admitted for altered mental status, sepsis, and generalized dusky macules and patches, flaccid bullae and skin sloughing in the setting of ceftriaxone therapy for a urinary tract infection. Exam was concerning for Stevens-Johnson Syndrome (SJS)/Toxic Epidermal Necrolysis (TEN) vs Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) vs acute cutaneous LE (ACLE). Work up revealed ANA, anti-dsDNA/Ro52/Ro60, pancytopenia, hypocomplementemia, and proteinuria. Skin biopsy demonstrated mild vacuolar dermatitis and negative direct immunofluorescence (DIF). Patient was diagnosed with systemic LE (SLE) and ACLE and started on IV methylprednisolone while continuing sepsis antibiotics. Steroids failed to control symptoms. She was transitioned to intravenous immunoglobulins (IVIg) and rituximab with significant improvement in her cutaneous lesions and mental status. Case 2: 19-year-old female with SLE (ANA, anti-dsDNA, Sm/RNP/Ro52/Ro60, hypocomplementemia, alopecia, arthritis, proteinuria, pericarditis, stage IV lupus nephritis) and discoid LE (DLE) presented to the ED with rapidly worsening diffuse DLE. She was on hydroxychloroquine, prednisone, belimumab, and cyclophosphamide, so additional immunosuppression was deferred. She was started on IVIg with rapid improvement in her DLE. Case 3: 37-year-old female with SLE (ANA, anti-dsDNA/Ro/La/RNP, alopecia, arthritis, lupus cerebritis, leukopenia, hypocomplementemia) and anti-phospholipid syndrome (APLS) (anti-cardiolipin/beta-2 microglobulin IgM) was admitted for a generalized maculopapular rash with vesicles, bullae, and focal skin sloughing, oral ulcers, lymphadenopathy, and elevated LFTs 10 days following therapy for disseminated tuberculosis. Exam was concerning for ACLE versus DRESS versus SJS/TEN. Biopsy results (mild vacuolar dermatitis, pigment incontinence, negative DIF) and exam favored an ACLE flare. Given her active tuberculosis and progressive skin sloughing on high-dose steroids, further immunosuppression was avoided. She was started on IVIg with remarkable symptomatic improvement.

Teaching Point: These cases demonstrate that IVIg may be an effective, safe treatment in severe forms of CLE requiring hospitalization with a high autoantibody burden, including those who do not responded to significant immunosuppression such as cyclophosphamide, potentially by mitigating the pathologic effects of autoantibodies underlying SLE.

DERMATOMYOSITIS IN A PATIENT WITH BENIGN ADRENAL ADENOMA RESPONDING TO LENABASUM AND ADRENALECTOMY

Darosa Lim, MD[1], Josef Concha, MD[1], Rachita Pandya, BA[1], Julianne Kleitsch, BA[1], Victoria Werth, MD[1,2]

1Department of Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
2Corporal Michael J. Crescenz VA Medical Center, Philadelphia, PA, USA

Email: darosa.lim@pennmedicine.upenn.edu

We report a 63-year-old male patient with anti-Mi-2 skin-predominant dermatomyositis (DM) with mild characteristic biopsy-proven DM rash. There was no proximal weakness and muscle enzymes were normal. Malignancy and interstitial lung disease screening were negative. His initial treatment with hydroxychloroquine 400 mg/day was discontinued due to nausea. He then entered a clinical trial in which he started taking lenabasum 20 mg BID in the open-label extension. The Cutaneous Dermatomyositis Disease Area and Severity Index (CDASI) score dropped from 21 to 7 in one month followed by mild fluctuations. The rash exacerbated one month after discontinuing lenabasum. The patient had a history of adrenal cortical adenoma and underwent adrenalectomy because of cortisol secretion, growing tumor size (5.7 cm), and concerning features for malignancy on imaging. The post-surgical histopathology didn't show malignancy. In the following weeks to months, he noticed an improvement of his DM rash reaching to almost clear. Although he initially received hydrocortisone replacement, the dose was low (equivalent to prednisone 12 mg/day quickly tapered over 6 weeks), and the improvement lasted after tapering was complete. A flare-up period occurred 2 weeks after Pfizer-BioNTech COVID-19 booster vaccination. A similar reaction happened after past Janssen COVID-19 vaccination. Nonetheless, at 11 months post-surgery, the patient observed an overall improvement of his rash with occasional mild exacerbations, treated with ruxolitinib cream. His photosensitivity notably decreased. The patient had non-specific mild intermittent dysphagia and dysphonia which resolved. DM is typically associated with malignant tumors in 15-25% of cases and cancer removal may or may not result in DM remission. Interestingly, this patient represents the second case reported of DM's association with adrenal adenoma, a benign tumor, showing skin improvement after adrenalectomy. It also features that DM may exacerbate after COVID-19 vaccination and this temporal association has been increasingly described in autoimmune diseases.

Teaching point: Dermatomyositis has rarely been reported to be associated with benign tumors (adrenal adenoma in this case) with clinical improvement after resection of the tumor, and COVID-19 vaccination has also been linked to DM exacerbation as in this case.

Poster Presentations

LUPUS ERYTHEMATOSUS

BLACK CUTANEOUS LUPUS PATIENTS ARE ASSOCIATED WITH POSITIVE FAMILY HISTORY OF CUTANEOUS LUPUS AND SYSTEMIC LUPUS

Heejo Keum, BS[1], L. Steven Brown, MS[2], Benjamin F. Chong, MD, MSCS[1]

[1]Department of Dermatology, University of Texas Southwestern Medical Center, Dallas, TX
[2]Department of Health Systems Research, Parkland Health, Dallas, TX

Email: ben.chong@utsouthwestern.edu

Various genetic polymorphisms have been associated with an increased risk of cutaneous lupus erythematosus (CLE). However, it is not fully known how often positive family histories occur in patients with CLE. Our study aimed to determine the rate of positive family history among CLE patients and identify risk factors associated with positive family history. A retrospective cohort study was conducted among 338 CLE patients seen in outpatient dermatology clinics at University of Texas Southwestern Medical Center and Parkland Health in Dallas, TX. Patients diagnosed with CLE by clinicopathologic correlation and aged over 18 years were included, while patients with drug-induced CLE were excluded. The primary outcome was positive family history of CLE and/or SLE. Univariate and multivariable logistic regression analyses were performed to identify risk factors associated with positive family history of CLE and/or SLE in patients with CLE. 34% (N=114) patients reported positive family history of CLE and/or SLE. 7% (N=23) of CLE patients had relatives with CLE, with 5% (N=18) having a first-degree relative with CLE. 30% (N=102) of CLE patients had relatives with SLE, and 15% (N=52) had a first-degree relative with SLE. Multivariable analyses showed that Black patients were more likely to have positive family history of CLE and/or SLE (odds ratio [OR]=2.13; 95% confidence interval [CI]=1.23-3.69, p=0.007). Positive family histories of SLE were more common than positive family histories of CLE in patients with CLE, likely due to patients' inability to recall CLE in their family members. Given our findings that at least 1/3 of patients had positive family histories of CLE and/or SLE, especially Blacks, we recommend asking all patients with CLE about their family history of CLE and SLE, and raising awareness to prompt their family members to seek evaluation. These data may help identify new genetic polymorphisms associated with positive family histories.

CIGARETTE SMOKING IS ASSOCIATED WITH DECREASED TREATMENT CESSATION OF MYCOPHENOLATE AND METHOTREXATE IN CUTANEOUS LUPUS ERYTHEMATOSUS

Henry W. Chen, BS[1], Grant Sprow, BA[2,3], Rui Feng, PhD[4], Victoria P. Werth, MD[2,3], Benjamin F. Chong, MD, MSCS[1]

[1]University of Texas Southwestern Medical Center, Department of Dermatology, Dallas, TX

[2]University of Pennsylvania, Department of Dermatology, Philadelphia, PA

[3]Corporal Michael J. Crescenz VA Medical Center, Philadelphia, PA

[4]University of Pennsylvania, Department of Biostatistics, Philadelphia, PA

Email: Ben.Chong@UTSouthwestern.edu

Treatment options for cutaneous lupus erythematosus (CLE) patients refractory to antimalarials include mycophenolate mofetil (MMF) and methotrexate (MTX). Determination of treatment outcomes, such as ability to discontinue medications due to improvement has not been assessed in CLE patients treated with MMF and MTX. Thus, we sought to evaluate treatment duration and characteristics of CLE patients associated with treatment outcomes with MMF and MTX. This was a retrospective cohort study of 43 CLE patients on MMF or MTX enrolled in two longitudinal, prospective registries and seen in outpatient dermatology clinics at University of Texas Southwestern Medical Center and University of Pennsylvania. Patients with systemic lupus erythematosus (SLE) with extracutaneous features, other rheumatologic diseases, or drug-induced lupus were excluded. Descriptive statistics and multivariable Cox proportional-hazards modeling was performed. There were 21 patients on MMF, 11 patients on MTX, and 11 patients on MMF and then MTX or vice versa. We found no difference between rates of discontinuation due to improvement in MMF (9/32, 28.1%) or MTX (4/22, 18.2%) groups (p=0.52). Median treatment duration was 17.9 months (IQR: 8.6-30.0) and 15.1 months (IQR: 10.9-23.3) for MMF and MTX, respectively. MMF and MTX groups showed no difference in medication discontinuation due to inefficacy (MMF (8/32, 25%) vs. MTX (6/22, 27.2%), p>0.99) or adverse effects (MMF (5/32, 15.6%) vs. MTX (6/22, 27.2%), p=0.32). Cox proportional-hazards modeling of treatment discontinuation due to improvement revealed that patients who were current/past smokers were less likely to discontinue medication due to improvement (adjusted HR: 0.20, 95% CI (0.05-0.80), p=0.02). We have previously shown smoking status to be a negative predictor of CLE disease remission. Smoking has been also associated with antimalarial-refractory disease. Further mechanistic studies on the deleterious effect of smoking on CLE and its treatments are warranted to elucidate this relationship.

LUPUS ERYTHEMATOSUS PATIENT HOSPITALIZATIONS BEFORE AND DURING THE COVID-19 PANDEMIC

Sareena Shah[1], Shrey Patel BS[2], Shiv Patel BA[3], Peter A. Lio MD[3]

[1]*University of Missouri-Kansas City School of Medicine, Kansas City, MO, USA*

[2]*University of Miami Miller School of Medicine, Miami, FL, USA*

[3]*Northwestern University Feinberg School of Medicine, Chicago, IL, USA*

Email: peterlio@gmail.com

Lupus erythematosus (LE) is an autoimmune disorder characterized by rash, joint pain, and inflammation. Due to both the underlying pathology and immunosuppressants typically used for management, patients with lupus are particularly vulnerable to COVID-19. We sought to analyze characteristics of hospitalized patients with lupus before and during the COVID-19 using a nationally representative sample of hospital encounters. We searched the 2016-2020 National Inpatient Sample for a non-primary diagnosis of LE (ICD-10-CM: L93) which included diagnoses of discoid lupus, subacute cutaneous lupus, and other local lupus. Age, sex, race/ethnicity, income, insurance status, and year of visit were also collected. Hospitalizations were categorized as being pre-pandemic (2016-2019) and during the pandemic (2020). A total of 75,385 patients were identified, with an average age of 58.5 years. When comparing pandemic with pre-pandemic data, chi-squared test with Rao & Scott's second-order correction showed higher costs ($P<0.001$), though there was no significant difference regarding mortality and length of stay. When adjusted for demographic factors, multivariate logistic regression analysis found that patients with LE were less likely to be hospitalized during the pandemic (aOR:0.84; 95% CI:0.80-0.89; $P<0.001$). The most common reasons for hospitalizations pre-pandemic were sepsis, pneumonia, and acute chronic obstructive pulmonary disease while the most common reasons for hospitalization during the pandemic were sepsis, COVID-19, and non-ST-elevation myocardial infarction. Our findings demonstrate a lower likelihood of hospitalization during the pandemic for LE patients, though COVID-19 was among the most common diagnoses. The decrease in hospitalizations during the pandemic may reflect successful adherence to medical recommendations for immunocompromised populations, including taking proactive measures. Future investigations should aim to elucidate the potential impact of pharmaceutical interventions in LE and their role in preventing hospitalization for COVID-19.

Poster Presentations

SCLEROSING DISORDERS

MORPHEA IN RACIAL AND ETHNIC MINORITY GROUPS: A MULTI-CENTER, CROSS-SECTIONAL STUDY

Maya Adams, BS[1]; Adrienne K. Joseph, MD[1]; Laila F. Abbas, MD[1]; Kaila L. Schollaert, MS[2], Kathryn S. Torok, MD[2,3], and Heidi T. Jacobe, MD, MSCS[1]
[1]University of Texas Southwestern Medical Center, Department of Dermatology, Dallas, TX
[2]University of Pittsburgh School of Medicine, Pittsburgh, PA
[3]Children's Hospital of Pittsburgh, Pediatric Rheumatology, Pittsburgh, PA

Email: Heidi.Jacobe@UTSouthwestern.edu

No studies have explored the effects of race or ethnicity on clinical outcomes of patients with morphea. We performed a cross-sectional study to describe racial and ethnic differences in clinical characteristics and patient-reported outcomes of patients with morphea and to describe the effect of skin pigmentation on clinical morphea severity scores. Our sample includes 1,090 patients [614 adults and 476 children, including 242 (22%) racial and ethnic minority (REM) patients from 2 prospective cohorts at the University of Texas Southwestern Medical Center and the University of Pittsburgh from 2000 to 2020.

Black patients (BP) [median(IQR) = 40(24-46)] were older at disease-onset compared to other groups Asian patients (AP): median(IQR) = 23(6.0-35), p=0.005; Hispanic patients (HP): median(IQR) = 18(8.7-41), p=0.001; non-Hispanic White patients (NHW) median(IQR) = 14(7.5-42), p<0.001]. BP were more frequently affected by pansclerotic morphea (9.5% of BP versus 0% AP, 3.3% HP, 1.6% NHW, 0% OP, p=0.022) and less often affected by linear morphea (29% of BP versus 65% AP, 59% HP, 51% NHW, 71% OP, p=0.001).

REM participants had higher Localized Scleroderma Damage Index scores due to increased frequency of severe dyspigmentation scores (NHW with 28% moderate and 6.9% severe dyspigmentation vs REM with 30% moderate and 13% severe dyspigmentation, P<0.001), but lower clinical activity scores, due to less erythema (43% NHW vs 33% REM, p=0.015). Adult REM participants had higher Dermatology Life Quality Index scores, [median(IQR) = 5(2-12)] when compared to NHW patients [median(IQR) = 4(1-8), p=0.011)].

These results suggest that morphea subtypes may differ based on race and REM patients may experience diminished quality-of-life due to increased damage from unrecognized erythema in the active phase of disease. This study is limited in generalizability, as this is not a population-based sample. Future validation of the LoSCAT and teaching images should include participants from REM backgrounds with morphea.

PREVALENCE AND CHARACTERISTICS OF PAIN IN PATIENTS WITH MORPHEA

Heejo Keum, BS[1], Maya Adams, BS[1], Heidi Jacobe, MD, MSCS[1]

[1]Department of Dermatology, University of Texas Southwestern Medical Center, Dallas, TX
Email: heidi.jacobe@utsouthwestern.edu

Morphea is not typically considered a painful condition. Prior studies found that pain in morphea patients is related to higher levels of psychological distress and negative impact on quality of life. However, it is not fully known how often pain is reported by patients with morphea. This study aims to discover the prevalence of pain in morphea patients and understand the characteristics of the patients who experience pain. A cross-sectional study was conducted on initial visits of 419 patients from the Morphea in Adults and Children cohort. The primary outcome was prevalence of pain in morphea patients. Presence of pain was determined by two pain-related questions with higher scores indicating greater severity: 1) pain in morphea lesion over the past month assessed on a visual analogue scale ranging from 0 to 10, 2) question 1 of SKINDEX 30+3, "My skin hurts," with possible five answer choices ranging from 0 to 100. Out of 417 patients who answered at least one of the two questions above, 267 patients (64%) reported a score greater than 0. The morphea patients with pain had significantly worse quality of life measured by the Dermatology Life Quality Index, Short Form-36 bodily pain domain, and SKINDEX 30+3 scores ($p<0.0001$ for each). The morphea patients with pain had significantly worse activity and damage in their skin lesions measured by the Localized Scleroderma Cutaneous Assessment Tool and Physician's Global Assessment ($p<0.0001$ for each). Between patients with non-generalized subtypes (linear, plaque, mixed, and indeterminate) and generalized subtype, the patients with generalized morphea were more likely to report pain (105/267[40.5%] vs 36/150[21.9%], $p=0.0015$). Deep involvement was not significantly associated with pain in morphea lesions. Our study shows that pain affects more than half of morphea patients, and further study is needed to better define the underlying mechanisms of pain in morphea.

CLINICAL PRACTICE GAPS IN PATIENTS WITH EXTRAGENITAL LICHEN SCLEROSUS: A RETROSPECTIVE REVIEW

Authors: Salvatore Daddario, BA[1,3*^], Subin Lim, BA[1,2*], Shawn Afvari, BS,[1,4], Nathaniel Goldman, BA[1,4], Kevin Yang, BS[1,5], Bina Kassamali, MD[1], Neda Shahriari, MD[1], Avery H. LaChance, MD, MPH[1]

Affiliations:

1. Department of Dermatology, Brigham and Women's Hospital, Boston, Massachusetts
2. Eastern Virginia Medical School, Norfolk, Virginia
3. Harvard Medical School, Boston, Massachusetts
4. New York Medical College School of Medicine, Valhalla, New York
5. Tufts University School of Medicine, Boston, Massachusetts

* denotes co-first authorship

Email: salvatoredaddario@hms.harvard.edu

Body:

Lichen sclerosus (LS) is a chronic inflammatory skin disorder characterized by progressive epidermal atrophy and hypopigmentation, usually of the anogenital area, predominantly affecting women between the ages of 40 and 60. The most common symptoms are vulvar pruritus, anal discomfort, dysuria, and dyspareunia. Patients may also present with extragenital lesions, though only 6% of LS cases are isolated on extragenital skin. For patients first presenting with extragenital lichen sclerosus (EGLS), a thorough history and examination of both the extragenital and genital skin can prevent diagnostic delays and improve patient outcomes by identifying concomitant genital lesions. In the present study, we conducted a retrospective analysis of 55 patients initially presenting with EGLS without known genital involvement at Brigham and Women's Hospital and evaluated whether or not genital involvement was assessed during their dermatologic care visits. For these patients, we found that providers documented no historical questions about genital involvement for 38.2% of patients and, of the 47.3% that did receive genital exams on this first visit, 69.3% did have findings consistent with genital LS. In total, only 56% of all patients who initially presented with EGLS have any genital exam documented in their dermatologic medical records and 67.7% of these patients went on to be diagnosed with genital LS. Our findings suggest that providers often do not inquire about genital involvement nor do they regularly perform genital exams for patients with an initial presentation of EGLS. Given the high rate of concomitant genital LS in patients with EGLS, it is imperative providers assess genital involvement to optimize patient outcomes and reduce the life-altering complications of genital LS, including introital stenosis and labial fusion.

CLINICAL PRESENTATIONS AND TREATMENT OUTCOMES IN EXTRAGENITAL LICHEN SCLEROSUS

Authors: Shawn Afvari[1,2*], Subin Lim, BA[1,3*], Salvatore Daddario, BA[1,4], Nathaniel Goldman, BA[1,2], Kevin Yang, BS[1,5], Bina Kassamali, MD[1], Neda Shahriari, MD[1], Avery H. LaChance, MD, MPH[1]

Affiliations:

1. Department of Dermatology, Brigham and Women's Hospital, Boston, Massachusetts
2. New York Medical College School of Medicine, Valhalla, New York
3. Eastern Virginia Medical School, Norfolk, Virginia
4. Harvard Medical School, Boston, Massachusetts
5. Tufts University School of Medicine, Boston, Massachusetts

*Indicates equal authorship

Email: safvari@bwh.harvard.edu

Body:

Lichen sclerosus (LS) is a relatively common inflammatory dermatosis predominantly affecting postmenopausal females in their 50's with a predilection for the anogenital area. Though lesions of LS may concomitantly appear on the extragenital skin, extragenital lichen sclerosus (EGLS) shows different pathological changes compared to genital LS. However, clinical manifestations in EGLS, aside from their distinct anatomical location, are not well characterized. Additionally, while anogenital LS generally shows response to corticosteroid treatment, data on treatment in EGLS is limited to several case reports. To address these gaps, we performed a retrospective review to evaluate common clinical presentation and response to different treatment modalities in 55 patients presenting with EGLS to Brigham and Women's Hospital. Our results showed that EGLS lesions were predominantly on the back, breast, and abdominal folds in 49.1%, 43.6% and 40.0% of patients, respectively. Patients were mostly symptomatic, where pruritus (60.0%, n=33) and painful lesions (20.0%, n=11) were the most commonly reported symptoms. Patients did not report any associated symptoms in 34.5% (n=19) of the cohort. Physical exam findings included epidermal atrophy, porcelain white color, and overlap with morphea in 60.0%, 54.2%, and 50.9% of patients, respectively. Across all treatment modalities, 29.1% (n=16) of patients experienced complete response and 41.8% (n=23) received partial clinical response. Of the 84 treatments administered, 31 (37%) were discontinued. Patients generally showed the greatest clinical response (complete and partial) to topical steroids (34.5%, n=19). Of the 18 patients refractory to topical steroids alone, combinational treatment of topical steroids with a calcineurin inhibitor showed greatest clinical response (18%, n=3). Our results better characterize clinical presentation of EGLS and suggest that treatment outcomes are poor compared to genital LS. We hope this study informs clinical practice and elucidates the need for novel therapies for EGLS.

INCIDENCE AND OUTCOMES OF COVID-19 HOSPITALIZATIONS IN SYSTEMIC SCLEROSIS PATIENTS

Shrey Patel BS[1], Shiv Patel BA[2], Sareena Shah[3], Peter A. Lio MD[2]

[1]*University of Miami Miller School of Medicine, Miami, FL, USA*

[2]*Northwestern University Feinberg School of Medicine, Chicago, IL, USA*

[3]*University of Missouri-Kansas City School of Medicine, Kansas City, MO, USA*

Email: peterlio@gmail.com

The COVID-19 virus is expected to disproportionately affect individuals with systemic sclerosis (SSc), as many of these patients are on immunosuppressive medications and are at risk of other lung diseases, such as interstitial lung disease. In our study, we analyze hospital outcomes and incidence of SSc in COVID-19 hospitalizations using a nationally representative sample of hospitalizations. We queried the 2020 National Inpatient Sample for a primary diagnosis of COVID-19 using the Clinical Classification Software Refined (CCSR) code INF012 and an accompanying diagnosis of SSc using the ICD-10-CM codes M34.0, M34.1, M34.8, and M34.9. Previous studies have validated these codes as having high positive predictive value in capturing SSc diagnoses. Age, sex, race/ethnicity, income, health insurance status, length of stay, cost of care, and mortality were also recorded. Patients aged less than 18 were excluded. Chi-squared test with Rao & Scott's second-order correction demonstrated a significantly lower incidence of COVID-19 ($p<0.001$) in SSc patients (2.8%) compared to the general inpatient population (3.8%). SSc patients were at higher risk of mortality (aOR: 1.61; 95%CI:1.01-2.57; $p=0.047$) but did not exhibit significantly different cost of care (Beta:-1,106; SE:1,252; $p=0.4$) or length of stay (Beta:-0.28; SE:0.439; $p=0.5$) when controlling for age, sex, race/ethnicity, income, health insurance status. Despite our findings revealing decreased incidence of COVID-19 in SSc patients compared to the general inpatient population, an accompanying diagnosis of SSc was associated with increased mortality, suggesting that SSc diagnosis carries a higher risk of developing negative sequelae of COVID-19. SSc patients hospitalized for COVID-19 may warrant additional treatment considerations in addition to the traditional standard of care, since hospitalized patients may be at higher risk of mortality.

Poster Presentations

DERMATOMYOSITIS

PROFILE OF DERMATOMYOSITIS BEFORE AND DURING THE COVID-19 PANDEMIC

Shiv Patel BA[1], Shrey Patel BS[2], Sareena Shah[3], Peter A. Lio MD[1]

[1]*Northwestern University Feinberg School of Medicine, Chicago, IL, USA*

[2]*University of Miami Miller School of Medicine, Miami, FL, USA*

[3]*University of Missouri-Kansas City School of Medicine, Kansas City, MO, USA*

Email: peterlio@gmail.com

Dermatomyositis (DM) is an autoimmune connective tissue disease primarily affecting the muscles and skin. With the changing landscape of medicine over the past three years, we sought to analyze the differences in patient profiles before and during the COVID-19 pandemic. We queried the 2016-2020 National Inpatient Sample for DM as a non-primary diagnosis using ICD-10-CM codes M33.1 and M33.9. Age, sex, race/ethnicity, income, insurance status, and year of visit were also collected. Pre-COVID was defined by years 2016-2019 and during the COVID-19 pandemic was defined as 2020. Individuals with DM were on average 59.9 years of age, mostly female (71.3%), and Medicare recipients (54.5%). In the chi-squared test with Rao & Scott's second-order correction, DM hospitalizations during the COVID-19 pandemic exhibited higher cost of care ($p<0.001$), lengths of stay ($p=0.047$), but lower mortality ($p<0.001$) when compared to pre-pandemic years. After controlling for demographic factors, our multivariable logistic regression analysis found that patients with DM had greater odds of being hospitalized during the COVID-19 pandemic than pre-pandemic (aOR=1.11; 95% CI:1.02-1.20; $p=0.012$). The most common principal diagnoses pre-COVID were sepsis, pneumonia, and acute kidney failure whereas sepsis, COVID-19, and other specified sepsis were more common during the pandemic. The results indicate that DM patients were significantly more likely to be hospitalized during the pandemic with one of the primary reasons being due to COVID-19, as well as developing negative hospitalization outcomes. Our findings add to the growing body of literature suggesting increased risk of hospitalization for DM patients during the pandemic and provide evidence for continued monitoring as we continue to navigate COVID-19 as well as future variants.

USE OF HYDROXYCHLOROQUINE IN DERMATOMYOSITIS COMPARED TO METHOTREXATE HAS HIGHER ODDS OF ADVERSE SKIN REACTION BUT NOT HOSPITALIZATION

Astia Allenzara[1], Alison Hollis[2], Carolina Alvarez[1], Haejin Lovelace, Steve Maczuga[3], Matthew Helm[3], Amanda Nelson[1], Galen Foulke[3]

[1]University of North Carolina, Division of Rheumatology, Allergy and Immunology and Thurston Arthritis Research Center, Chapel Hill, NC
[2]University of North Carolina, School of Medicine, Chapel Hill, NC
[3]Penn State Health Milton S Hershey Medical Center, Department of Dermatology, Hershey, PA
Email: astia.allenzara@unchealth.unc.edu

Hydroxychloroquine (HCQ) for treatment of dermatomyositis (DM) has been associated with adverse cutaneous reactions. Previous studies demonstrated that patients who did not respond to HCQ had higher myeloid dendritic cells on skin biopsy, and an adverse reaction was significantly associated with DM patients having small ubiquitin like modifier 1 activating enzyme (SAE-1/2) antibody. We sought an active comparator, new user design to assess differences in adverse skin reactions or hospitalizations between HCQ and methotrexate (MTX) use. We retrospectively analyzed TriNetX data, a national federated network of de-identified data from insurance registries. Patients were identified by entry of two International Classification of Disease (ICD) codes indicating DM separated by ≥ 6 months who had a prescription for HCQ or MTX on or after DM diagnosis without prescription for the other medication. ICD codes for adverse cutaneous rash or CPT codes for hospital admission were defined as two separate outcomes if they occurred 4 months from prescription start date. Logistic regression modeling the odds of each outcome was used to produce adjusted odds ratios (aOR) and 95% confidence intervals (CI) comparing HCQ to MTX, adjusted for: age at first DM diagnosis, year of birth, sex, and time from DM diagnosis to first prescription. We found 1400 patients on MTX and 1364 on HCQ. Overall, we found no significant difference in odds of any hospitalization in those taking HCQ (aOR 1.05 [95% CI 0.79, 1.39]). Patients with DM on HCQ had higher odds, 1.30 (1.02, 1.59), of adverse cutaneous reaction diagnosis, compared to patients on MTX. Age at DM diagnosis was an effect modifier of this association, with higher odds of adverse cutaneous reaction if taking HCQ among those younger at diagnosis. HCQ use, especially in younger patients, may be associated with higher odds of adverse cutaneous skin reaction compared to MTX use.

HOW PATIENTS FEEL ABOUT THEIR DERMATOMYOSITIS: A QUALITATIVE STUDY

Authors: Julianne Kleitsch, BA[1,2], Jeffrey D. Weiner, BA[1,2], Rachita Pandya, BA[1,2], Josef S. Concha, MD[1,2], Darosa Lim, MD[1,2], Anisha Jobanputra, BS[1,2], DeAnna Diaz, MS, MBS[1,2], Victoria P. Werth, MD[1,2]

1. Department of Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

2. Corporal Michael J. Crescenz VAMC, Philadelphia, PA, USA

Corresponding author: Dr. Victoria P. Werth, werth@pennmedicine.upenn.edu

Abstract:

Dermatomyositis (DM) is a rare autoimmune disease characterized by distinctive cutaneous manifestations, often accompanied by muscle inflammation. DM has a significant impact on quality of life in patients due to the physical and emotional symptoms caused by their disease. In this pilot study we aimed to collect patient-generated factors on how adult DM patients feel about their disease. Thirteen patients with DM presenting to an autoimmune dermatology clinic were randomly selected to be interviewed about how their cutaneous findings have impacted their life. Patients were asked three questions: what troubles you the most about your cutaneous/skin DM, how much bother does the skin DM cause, and what about your skin disease most impacts your daily life. Responses were scribed by a second researcher. Themes and subthemes from the interviews were generated through independent review of transcripts and agreed upon with the research group. Theme saturation was reached with the 13th patient. Of 13 patients, 13 (100%) were female, 8 (62%) had amyopathic DM, median age was 65 years (IQR 48-69), and median Cutaneous Dermatomyositis Disease Area and Severity Index activity score was 12 (IQR 6-16.5). Seven themes emerged: Physical Manifestations (n=13, 100%), Disruption of Daily Life (n=9, 69%), Emotional Symptoms (7, 54%), Uncertainty about Disease (n=6, 46%), Social Impact (n=6, 46%), Optimism (n=4, 31%), and Difficulty in Management (n=3, 23%). Most reported physical signs included: itchiness (n=7, 54%) and physical pain/uncomfortableness (n=5, 38%). Most reported subthemes of Disruption of Daily Life included: limitation on activities due to sun/heat (n=8, 62%) and need to always protect self from the sun (n=5, 38%). We found that DM patients are burdened by their itchy/painful skin lesions and limitations on activities due to their photosensitivity. This better understanding of how patients feel will help guide management and allow clinicians to better address patient needs.

TIME TO DIAGNOSIS AND COMORBIDITY SCREENING A DIVERSE COHORT OF PATIENTS WITH DERMATOMYOSITIS AT A TERTIARY CARE INSTITUTION

David M. Weiner[1], Maria Fazal[1], Advika Dani[1], Jun Kang MD[1]

[1] Department of Dermatology, Johns Hopkins University

Corresponding Author: dweine13@jh.edu

Dermatomyositis is a rare autoimmune inflammatory myositis with several comorbidities including associated malignancy and interstitial lung disease. Dermatomyositis can be challenging to diagnose due to the rarity of the condition and its overlap with other causes of skin rash and/or myositis. In patients with darker skin, the skin disease of DM can be more difficult to recognize. There are also well-documented racial disparities that may contribute to morbidity and mortality in more common connective tissue diseases such as lupus erythematosus. The degree to which a patient's skin color affects time to diagnosis and screening for comorbidities has not been studied in-depth in dermatomyositis. To investigate this question, we retrospectively reviewed the charts of 75 patients with a diagnosis of dermatomyositis and classified patients by Fitzpatrick skin type based on clinic notes and photographs. We then gathered data on time from symptoms to diagnosis and time from diagnosis to initiation of cancer screening and ILD screening. 54 patients and 21 patients had Fitzpatrick skin type I-III vs. IV-VI, respectively. There was no significant difference among patients with Fitzpatrick type I-III vs. IV-VI in time to diagnosis (19 months vs. 16 months; p=0.79). Patients with darker skin color had an increased time to initiation of cancer screening (80 days vs. 182 days; p=0.04). There was also a trend of increased time to initiation of ILD screening in patients with darker skin color (94 days vs. 285 days; p=0.29). We are currently investigating for clinical and socioeconomic factors related to these observed differences.

EVALUATING CLINICAL RESPONSIVENESS OF CDASI-ACTIVITY SCORES FOR DERMATOMYOSITIS IN THE LENABASUM PHASE 3 CLINICAL TRIAL

Rachita Pandya, BA[1], Joshua Dan, BA[1], Julianne Kleitsch, BA[1], Josef Concha, MD[1,2], Darosa Lim, MD[1], Barbara White, MD[3*], Victoria P. Werth, MD[1,2*]
*Co-senior authors

[1]Department of Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
[2]Corporal Michael J. Crescenz VAMC, Philadelphia, PA, USA
[3]Corbus Pharmaceuticals, Inc., Norwood, MA, USA
Email: werth@pennmedicine.upenn.edu

Dermatomyositis (DM) is a heterogeneous, autoimmune disease with skin and muscle involvement to varying extents. With its significant impact on quality of life and recalcitrance to current standard-of-care treatments for some, more treatment options are needed. Clinical trials use outcome measures to assess disease activity, such as the CDASI-activity (CDASI-A) scores for cutaneous disease in DM. To be clinically useful, measures must demonstrate responsiveness to change. We assessed clinical responsiveness of and estimated thresholds for minimal clinically significant change in the CDASI-A score from the lenabasum study, the largest DM Phase 3 trial to date. Our study population consisted of a majority of middle-aged, female patients and included both amyopathic (n = 16) and classic subtypes (n = 125). We assessed physician-reported degrees of improvement in skin disease activity and corresponding mean changes in CDASI-A scores from baseline, at weeks 16, 28, and 52. Of note, physician-reported improvement was defined as 1) no vs yes improvement and 2) if yes, slight vs moderate vs major improvement. Mean changes in CDASI-A for no, slight, moderate, and major improvement include: -4.8; -5.1; -8.6; -12.0 (Week 16), -1.9; -5.5, -8.6, -17.1 (Week 28), and 0.5; -6.2; -13.3; -17.5 (Week 52). Across all weeks, mean changes increased with each degree of improvement, with most step changes associated with statistically significant greater improvement than the previous degree ($p < 0.05$). Additionally, the mean score change for slight improvement represents the minimal clinically significant change. This value is close to a 5-point change for each week, which is consistent with previous research on a clinical database of DM patients. Our study presents a novel assessment of the CDASI-A outcome from the investigator's perspective in the largest, prospective DM study, and suggests usefulness of CDASI-A scores for measuring skin disease in future DM trials.

Lenabasum, a cannabinoid type 2 receptor agonist, activates diverse cell-specific pathways in Dermatomyositis

Nilesh Kodali, BS[1,2]; Thomas Vazquez, MD[1,2]; DeAnna Diaz MS, MBS[1,2]; Joshua Dan, BA[1,2]; Grant Sprow, BA[1,2]; Rohan Dhiman, BS[1,2]; Mariko Momohara MD, PhD[1,2]; Muhammad M. Bashir, PhD[1,2]; Meena Sharma, PhD[1,2]; Victoria P. Werth, MD[1,2]

[1] Corporal Michael J. Crescenz VAMC, Philadelphia, PA

[2] Dermatology, University of Pennsylvania, Philadelphia, PA

Email: Dr. Victoria P. Werth, werth@pennmedicine.upenn.edu

Dermatomyositis (DM) is a systemic autoimmune disease that affects the skin and muscle. Lenabasum, a cannabinoid type 2 receptor (CB2R) agonist, has been developed as a potential treatment to reduce inflammation in DM. Lenabasum has also shown to exert its anti-inflammatory effects through the binding of peroxisome proliferator-activated receptor gamma (PPARγ). Lenabasum treatment recruits cyclooxygenase 2 (COX2) and lipoxygenase enzymes (15LOX1). We investigated the downstream lenabasum-specific pathway preference through CB2R or PPARγ in various leukocyte cell populations. COX2/15LOX1 enzymes were utilized as biomarkers for downstream lenabasum pathway activation. Flow cytometry was used to quantify differences in IFNβ levels (a marker for DM inflammation) with various CB2R/PPARγ inhibitions in the presence of lenabasum. We found that lenabasum acts through the CB2R in CD4T cells due to a significant reduction (Median Frequency of Parent [MFOP] from 12.6% to 3.46%) in IFNβ upon treatment with lenabasum but a slight nonsignificant decrease (MFOP from 7.56% to 4.46%) when CB2R was inhibited. Plasmacytoid dendritic cells (pDCs) favor a PPARγ-dominant pathway due to the significant reduction in IFNβ levels (MFOP from 9.964% to 2.86%) when treating with lenabasum with or without CB2R inhibition, but a non-significant decrease (MFOP from 55.21% to 42.246%) when inhibiting PPARγ. In myeloid dendritic cells (mDCs), lenabasum significantly reduced IFNβ levels when either CB2R (MFOP from 9.545% to 3.2215%) or PPARγ (MFOP from 46.105% to 21.775%) were inhibited independently. When both receptors were inhibited simultaneously, lenabasum treatment displayed a nonsignificant increase (MFOP from 28.665% to 40.91%) in IFNβ levels. COX2 and 15LOX1 levels significantly increased in mDCs and CD4T+ cells with lenabasum treatment, but not pDCs. Altogether, these results show that lenabasum has a cell-specific pathway preference in the blood and the efficacy of the treatment could vary across patients due to potential baseline cell-to-cell differences in CB2R and PPARγ levels.

Poster Presentations

CASES

Vasculitis and Vasculopathy in a patient with Lactobacillus Bacteremia

Authors: Allison Kranyak, MD[1,2], Matthew Davis MD[2], Alicia T. Dagrosa, MD, MBA[2]
1. Department of Internal Medicine, Dartmouth Health, Lebanon, NH
2. Department of Dermatology, Dartmouth Health, Lebanon, NH

Corresponding Author: Allison Kranyak, allisonckranyak@gmail.com

Lactobacillus is a gram-positive bacterium common in the human gastrointestinal and female genital tracts. Though found in commonly ingested probiotics, there has been debate over the safety of probiotic use in inflammatory bowel disease and immunocompromised patients. We present a case of an immunocompetent 76 year old male discovered to have Lactobacillus bacteremia presenting with cutaneous findings. Our patient presented with fever, altered mental status, progressive swelling and a lower extremity rash of unknown time course. On exam, patient had scattered palpable purpura on bilateral lower extremities and a discrete patch of retiform purpura, with several, small, tense bulla, on the left dorsal foot and distal shin (Figure 1). Two biopsies were obtained: one on the right thigh of a purpuric papule and one on the left dorsal foot of a violaceous patch. Biopsy from the right thigh revealed findings consistent with leukocytoclastic vasculitis, while biopsy from the left dorsal foot showed thrombi of small and large vessels, scattered neutrophils, and occasional extravasated erythrocytes, suspicious for thrombotic vasculopathy. Rheumatology evaluated the patient, and work up for a systemic vasculitis was negative. An angiogram revealed a left popliteal thrombus and disease in the distal arteries, thus the patient underwent balloon angioplasty. Blood cultures from two different sites grew Lactobacillus; transesophageal echocardiography did not show any vegetation. Multiple repeat cultures also grew Lactobacillus. Lactobacillus bacteremia in the absence of immunosuppression or colitis is exceedingly rare. Though this patient noted taking a daily probiotic and eating greek yogurt, it is difficult to say the source of his bacteremia. His bacteremia and palpable purpura resolved with antibiotic therapy, and he is now followed by vascular surgery for limb ischemia.

Teaching point: Lactobacillus should not be overlooked as a cause for bacteremia and potentially associated vasculitis.

ASYMPTOMATIC SUBCUTANEOUS NODULES AS A PRESENTATION OF GRANULOMATOUS MEDIUM-VESSEL VASCULITIS IN SYSTEMIC LUPUS ERYTHEMATOSUS

Brynn Sargent[1*], Cameron Zachary[2*], Xiying Fan[2], Calving Sung[2], Michael Cheng[3], Linda Doan[2], Michelle Min[2]

1 School of Medicine, University of California Irvine, Irvine, CA, USA

2 Department of Dermatology, University of California Irvine, Orange, CA, USA

3 Department of Rheumatology, University of California Irvine, Orange, CA, USA

* = co-first authors

Email: cameronz@hs.uci.edu

A 37-year-old female with systemic lupus erythematosus (SLE) complicated by lupus nephritis presented with subcutaneous nodules of her back. Lesions progressed despite immunosuppression with prednisone and mycophenolate mofetil. Examination revealed numerous skin-colored nodules of her lower back that were fleshy and non-tender to palpation (Figure 1A). She also had stellate ulcerations and violaceous papules on all extremities (Figure 1B). Laboratory evaluation was notable for positive ANA (1:160, speckled) and anti-Smith antibodies and decreased C3/C4. Other work-up including MPO/PR3, antiphospholipid antibodies, cryoglobulin, urinalysis, and chest radiograph were normal. Histopathology from the back revealed fibrinoid necrosis of a muscular artery with associated histiocytic aggregates, suggestive of granulomatous medium-vessel vasculitis (Figure 2A). Colloidal iron stain highlighted significantly increased dermal mucin (Figure 2B), which can be seen in connective tissue disease and raised the possibility of concomitant papulonodular mucinosis. Granulomatous medium-vessel vasculitis is a rare cutaneous presentation of SLE. It typically manifests as ulcers, livedo reticularis, and/or painful erythematous nodules. Our patient was unique in that she had nontender, skin-colored nodules. We hypothesize that ongoing immunosuppression and additional features of cutaneous papulonodular mucinosis, another rare presentation seen with SLE, contributed to her atypical presentation. Overall, individuals with medium-vessel vasculitis should undergo assessment for internal involvement, which can affect prognosis. Treatment options include systemic corticosteroids or other immunomodulatory therapies. Given the recalcitrance of our patient's disease, she is currently on high-dose prednisone, mycophenolate mofetil, rituximab, intravenous immunoglobulin, aspirin, pentoxifylline, and sildenafil. We present this case for the unique cutaneous presentation of a rare granulomatous medium-vessel vasculitis in the setting of underlying SLE.

Teaching Point: Granulomatous medium-vessel vasculitis is a rare finding associated with systemic lupus erythematosus; it may present as diffuse, nontender subcutaneous nodules in the setting of marked mucinosis and immunosuppression.
Category: Clinical Case

Figure 1A. Scattered fleshy, non-tender nodules of the lower back.

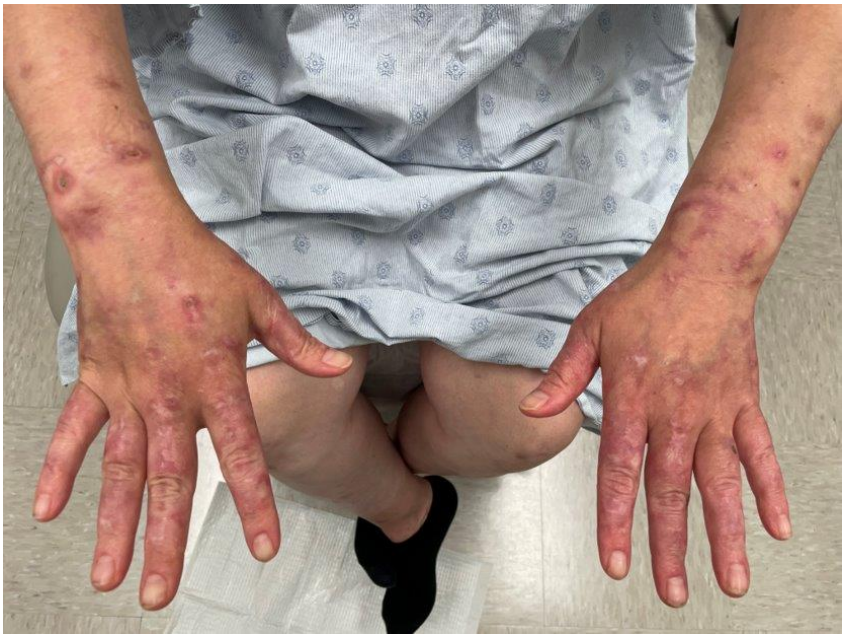


Figure 1B. Violaceous papules and stellate ulcerations on the bilateral dorsal hands and forearms.

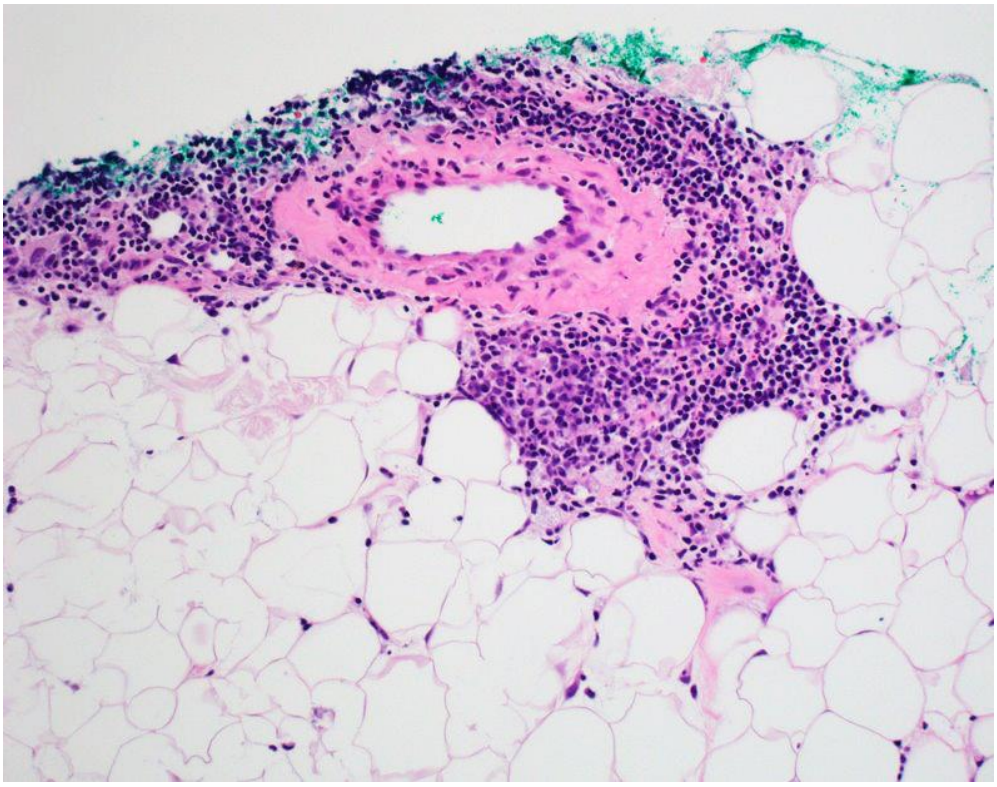


Figure 2A. Medium sized vessel with fibrin replacing vessel wall surrounded by lymphocytic and neutrophilic infiltrate (H&E, 20X).

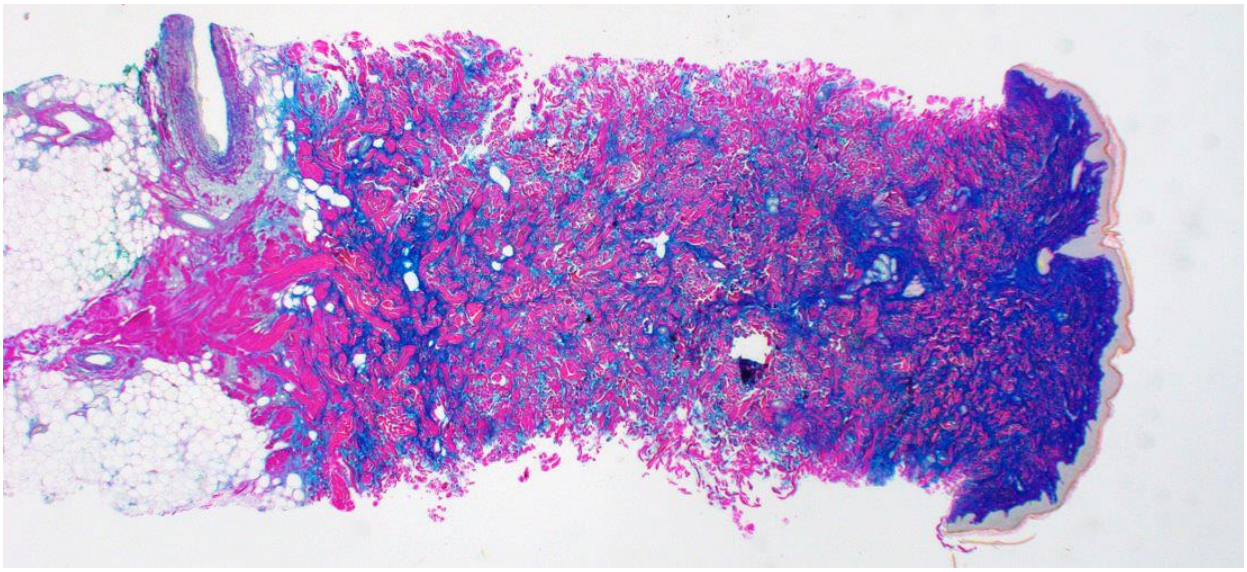


Figure 2B. Significantly increased mucin throughout the dermis, highlighted by colloidal iron stain (4X).

Eosinophilic annular erythema responding to doxycycline

Jade N. Young BS[1], Jina Chung MD[2], Nicole Fett MD, MSCE[2]

[1]School of Medicine, Oregon Health and Science University, Portland OR
[2]Department of Dermatology, Oregon Health and Science University, Portland OR
Email: youngjad@ohsu.edu

Eosinophilic annular erythema (EAE) is a rare skin disease characterized by relapsing and remitting pruritic, annular erythematous plaques and tissue eosinophilia. Due to its rarity, there is no standard treatment for EAE. We describe a case of EAE with clinical response to doxycycline. A 39 year old male presented with a mildly pruritic rash consisting of urticarial plaques that had relapsed and remitted for nine years. During an evaluation several years prior he underwent workup for Lyme Disease which was notable for positive Anti-Borrelia IgM serologies. He was prescribed intermittent courses of doxycycline ranging from 2 weeks to three months during which time the rash would resolve. No other therapies were effective. On exam the rash consisted of multiple large concentric, annular edematous plaques with some linear and arcuate plaques and papules distributed across the back and right buttock, with smaller similar plaques on the trunk, genitals, and upper thigh without excoriations (Figure 1). A biopsy revealed superficial and deep perivascular dermatitis with numerous eosinophils and some neutrophils, with an absence of flame figures. Based on clinical and histopathologic findings, the patient was given a diagnosis of eosinophilic annular erythema. Treatment was re-initiated with doxycycline 100 mg twice daily given previous improvement on this medication, and the patient reported substantial improvement at follow-up three months later. To our knowledge, no cases of EAE improving with doxycycline have been reported in the literature and thus our findings highlight a potential new therapy to consider in the approach to a patient with EAE.

Teaching point: Doxycycline 100mg twice daily may be an effective therapy for eosinophilic annular erythema

Category: Clinical Case

Figure 1: Large concentric, annular, and edematous plaques with some linear and arcuate plaques and papules distributed across the back and right buttock consistent with eosinophilic annular erythema

METHOTREXATE FOR TREATMENT OF LIVEDOID VASCULOPATHY: AN OLD BUT FAMILIAR ALTERNATIVE

Hailey J Pfeifer, BS,[1] Hadir Shakshouk, MBBS,[2] Kara Cheung, BS,[1] Nicole Fett, MD, MSCE[2] and Alex Ortega-Loayza, MD, MCR[2]

[1]Oregon Health & Science University School of Medicine, Portland, Oregon, USA
[2]Department of Dermatology, Oregon Health & Science University, Portland, Oregon, USA.
Email: pfeiferh@ohsu.edu

Livedoid vasculopathy (LV) is a rare, chronic, thrombo-occlusive cutaneous vasculopathy characterized by recurrent, painful lower extremity ulceration. While LV is classically associated with hypercoagulable disorders, inflammatory pathways may play a considerable role in its pathogenesis. Treatment of LV is notoriously difficult and no single agent has been shown to be universally effective. Anticoagulants are typically considered first-line in the therapeutic ladder, but adverse effects and patient comorbidities can limit their use. The objective of this case series was to describe the possible therapeutic role of methotrexate (MTX) in LV, which has not been included in previous treatment algorithms for this condition. This retrospective case series included four patients with LV treated with MTX dosed at 10 to 15 mg weekly as a single or adjuvant agent at our institution. Primary outcome was time from initiation of MTX to complete wound healing, and additional outcomes included ulcer recurrence and pain. At the time of MTX initiation, duration of disease ranged from 2 months to 16 years. Complete healing was observed in all four patients, with median healing time of 5.6 months (range 2.3-15.8) and mean 7.3 months ((± 5.9) after starting MTX. All patients experienced improvement in pain, as evidenced by diminished patient-reported pain scores and discontinuation of pain control agents in all cases. Two patients (50%) experienced ulcer recurrence on tapering or discontinution of MTX. However, they achieved healing after re-intiation of MTX. All patients have since successfully discontinued MTX with no further recurrence to date. Based on our observations, MTX is effective at reducing pain and achieving wound healing in LV. These findings suggest that MTX can be added to the armamentarium of management for this condition. Further prospective studies would be beneficial to better understand MTX's therapeutic mechanisms and efficacy in LV.

A TOPICAL JAK INHIBITOR FOR THE TREATMENT OF CUTANEOUS SARCOIDOSIS

Jeffrey S. Smith[1,2], Michael Woodbury[2], Joseph F. Merola[1,2]

[1]Department of Dermatology, Brigham and Women's Hospital, Boston, MA, USA

[2]Harvard Medical School, Boston, MA, USA

Email: jfmerola@bwh.harvard.edu

A 66-year-old female with a history of multisystem sarcoidosis, including lung, pericardial, and skin involvement presented to the dermatology outpatient clinic at Brigham and Women's Hospital with an indurated pink plaque on her left forehead for two months duration. In the clinical context the lesion was consistent with prior biopsy-proven cutaneous sarcoidosis. Her internal sarcoidosis was well-controlled on infliximab 10mg/kg infusions every four weeks and methotrexate 25mg subcutaneous weekly. However, the patient continued to have flares of recalcitrant cutaneous disease. Her forehead lesion was refractory to low-potency topical steroids and had recurred despite transient benefit with intralesional kenalog (ILK) at 5mg/mL. In addition, the patient was concerned about recurrence of steroid-induced skin atrophy with continued treatments with ILK or high-potency topical steroids. We therefore recommended a steroid-sparing topical agent, as the risk:benefit profile of adding a third systemic immunomodulator was determined to be unacceptably high. Topical tacrolimus was initially prescribed but denied by insurance, despite appeal. Given benefits in systemic sarcoidosis with oral Janus Kinase (JAK) inhibitors, we prescribed and eventually obtained insurance coverage for ruxolitinib 1.5% cream, a topical JAK inhibitor. Her forehead lesion resolved within six weeks of twice daily application. We predict that similar efficacy will be observed in other cutaneous granulomatous processes with a predominant Th1 profile. This case also provides an opportunity to review recent extended safety data of oral JAK inhibitors. Our case suggests that in certain diseases topical JAK inhibitors may provide similar cutaneous benefit with an improved safety profile relative to oral therapy.

Category: Clinical Case

Teaching Point: This case provides support for using topical JAK inhibitors in the treatment of cutaneous sarcoidosis.

LATERAL CANTHUS HELIOTROPE IN ANTI-MDA5+ DERMATOMYOSITIS

Maha Kazmi1, Rodrigo Gutierrez2, M. Kari Connolly1, Anna Haemel1
1Department of Dermatology, University of California, San Francisco, San Francisco, CA
2University of California, San Francisco School of Medicine, San Francisco, CA

Email: maha.kazmi@ucsf.edu

Anti-melanoma differentiation gene 5 (anti-MDA5) antibody-associated dermatomyositis (DM) is characterized by a unique clinical phenotype including ulcerative skin lesions, with patients often demonstrating inflammation and ulceration along the palmar interphalangeal creases. An ulcerative heliotrope eruption was recently described in two MDA5 positive patients with DM [1]; these lesions presented prominently along the lateral canthus in both prior cases. Here we present 3 additional examples of lateral canthus heliotrope in MDA5 positive adults with DM, including non-ulcerative presentation, with inflammation associated with this highly mobile facial skin fold being the common theme. The lateral canthus may be prone to inflammation related to Koebnerization in DM [2], with factors including stretching forces and physical irritation from tears. While further observation is required, we suggest heliotrope along the skin creases of the lateral canthus, particularly with ulceration, may be a sign of MDA5 positive disease similar to ulcers in the skin folds of the palms.

References:

1.Daugherty TT, Cheeley JT. Ulcerative Heliotrope Rash in Antimelanoma Differentiation-Associated Gene 5 Dermatomyositis. Cutis. 2021 May;107(5):E5-E8.
2.Kurtzman DJ, Ho A, Wright NA, Rubenstein MH, Vleugels RA. Unilateral Gottron Papules in a Patient Following a Stroke: Clinical Insights Into the Disease Mechanisms and

LUPUS PANNICULITIS IN A PATIENT WITH INHERITED MUSCULAR DYSTROPHY: ALTERED PRESENTATION AND POSSIBLE MECHANISTIC CONNECTION

Connor R. Buechler, M.D.[1,2], Kevin J. Gaddis, M.D.[1], David R. Pearson, M.D.[1]

[1]Department of Dermatology, University of Minnesota, Minneapolis, MN

[2]Department of Internal Medicine, University of Minnesota, Minneapolis, MN

Email: pearsond@umn.edu

Lupus erythematosus panniculitis (LEP) is a form of chronic cutaneous lupus caused by inflammation in deep dermis and adipose tissue that typically manifests with indurated nodules in fatty areas and rarely affects the distal lower extremities, a feature that may be used to distinguish it from other panniculitides. Multiminicore disease (MmD) is a recessive congenital skeletal myopathy that causes progressive loss of subcutaneous adiposity and fibrofatty replacement of involved skeletal muscle. We present a 66-year-old woman with MmD who developed redness, tense swelling, subcutaneous pain, and progressive stiffness in her right lower leg for two months unresponsive to antibiotics, compression, and mid-potency corticosteroid. Examination revealed a circumferential, ill-defined, erythematous, hyperpigmented, indurated plaque from mid-calf to the talocrural joint (Fig 1). Laboratory analysis showed no leukocytosis, no anemia, and neither anti-nuclear nor extractable nuclear antibodies. Musculoskeletal MRI demonstrated subcutaneous edema alongside fatty infiltration and edema of the soleus. Biopsy revealed vacuolar interface dermatitis with lobular lymphocytic panniculitis and periadnexal lymphocytic inflammation with germinal centers in adjacent septae and hyalinizing necrosis of adipose tissue (Fig 2A). Clusters of CD123+ plasmacytoid dendritic cells were seen within lymphocytic inflammation (Fig 2B), supporting a diagnosis of LEP. She improved with hydroxychloroquine 5 mg/kg/day and mycophenolate mofetil 2000 mg daily. This case illustrates the relationship between tissue infrastructure and presentation of connective tissue disease, as altered patterns of adiposity caused this patient's LEP to mimic lipodermatosclerosis. This case also highlights a possible mechanistic connection between muscular dystrophies and AICTD. Muscular dystrophies predispose to autoimmune myopathies via alteration to cell-stress pathways, free radical damage, aberrant energy metabolism, dysregulated protein homeostasis, and mitochondrial damage. These same mechanisms could cause epitope spread and predispose to non-myopathic autoimmune disease, including LEP. We have in our clinic several patients with muscular dystrophies (or carrier status) and AICTD with no other identifiable trigger.

Teaching point: Attention should be paid to tissue displacement or replacement when considering presentations of connective tissue pathologies in those with altered connective tissue infrastructure. A possible mechanistic connection between inherited myopathy and AICTD may be a fruitful area for further study and advance understanding of both conditions.

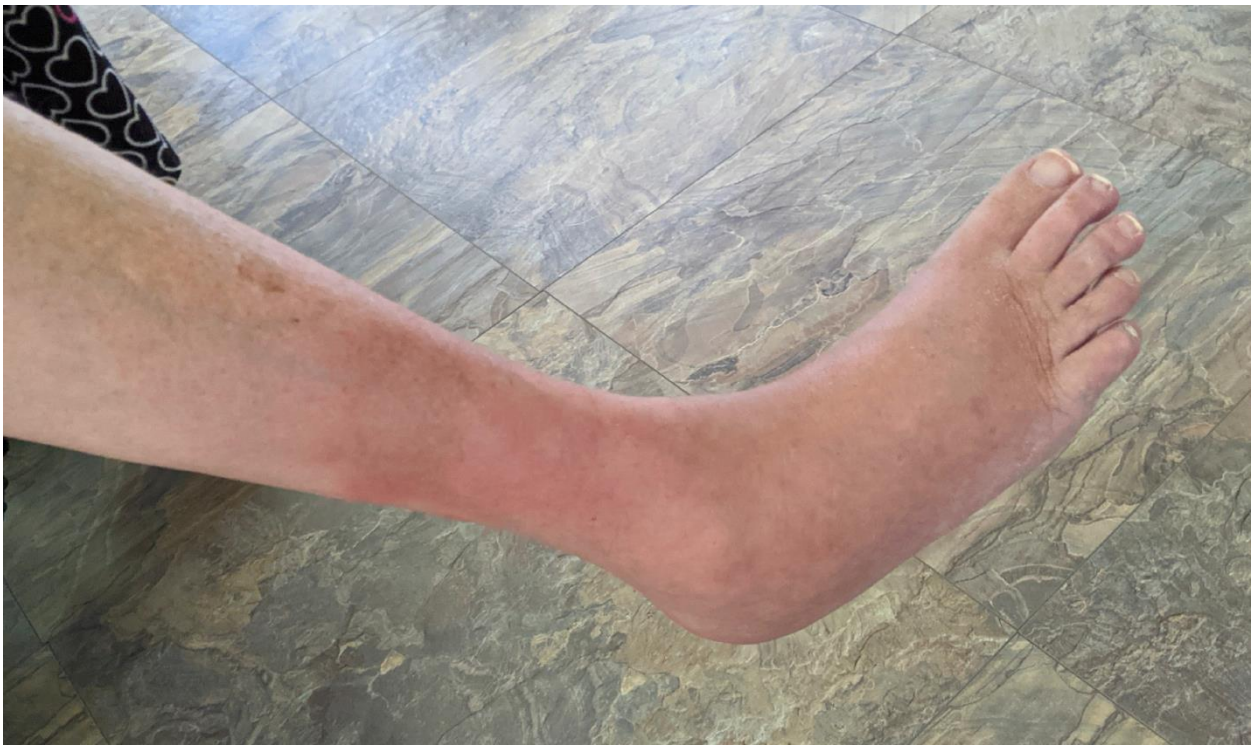


Figure 1 – Circumferential erythematous indurated plaque with hyperpigmentation on the right lower extremity.

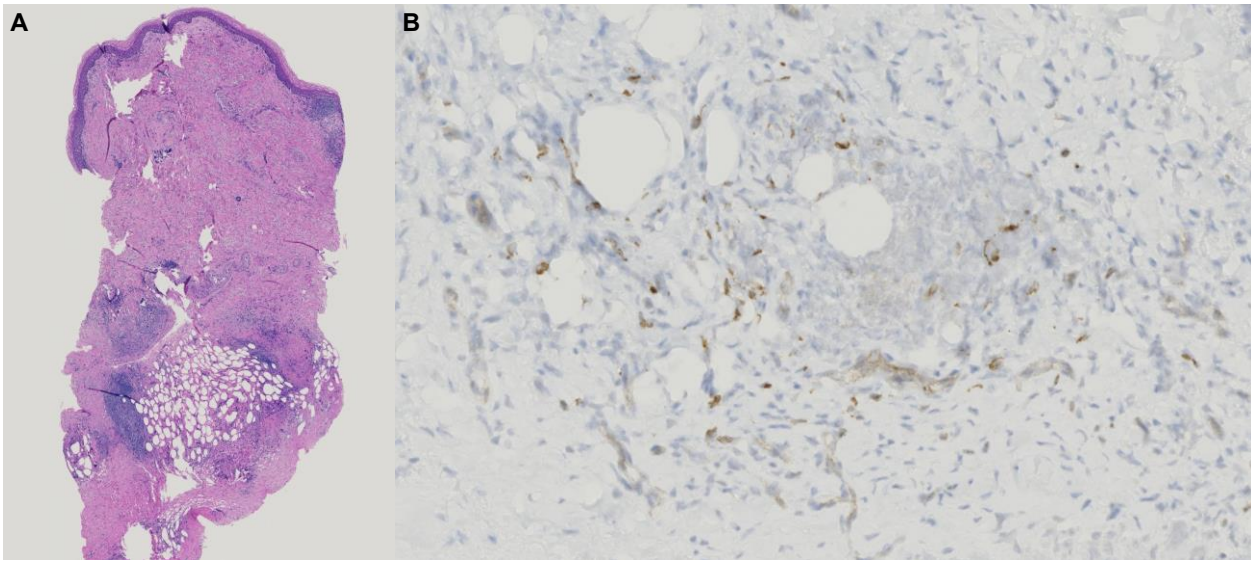


Figure 2 – (A) Hematoxylin and eosin stain showing interface dermatitis with effaced rete pattern, superficial and deep perivascular dermatitis, and lobular panniculitis with hyalinizing fat necrosis and nodules of lymphocytes within a thickened septum. (B) CD123 stain at 100x magnification, demonstrating an increase in CD123-positive plasmacytoid dendritic cells in the lymphoid infiltrate.

A CASE OF ANTI-SAE DERMATOMYOSITIS WITH ATYPICAL HISTOPATHOLOGY

David M. Weiner AB[1], Aravindhan Sriharan MD[2], Dorothea T. Barton MD[3]

[1] Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA

[2] Department of Pathology, Dartmouth Health, Lebanon, NH

[3] Department of Dermatology, Dartmouth Health, Lebanon, NH

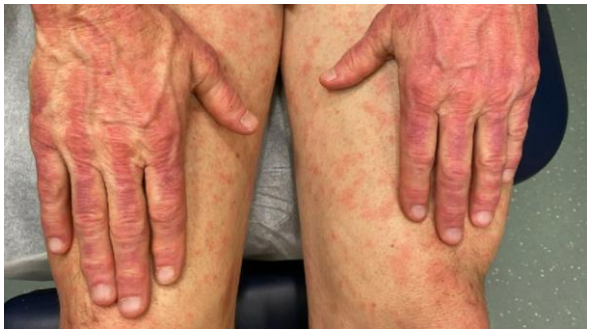
Corresponding Author: david.weiner@pennmedicine.upenn.edu

Approximately 100 cases of anti-small ubiquitin-like modifier-1 activating enzyme dermatomyositis (anti-SAE DM) have been reported since this rare and poorly characterized subtype was first identified in 2007. We report a 63-year-old White male with anti-SAE DM who presented with atypical histopathology. Our patient first presented with diffuse pink and violaceous erythema of the face and scalp involving the forehead and nasolabial folds but sparing the eyelids (no heliotrope rash). He had periungual erythema and later developed Gottron papules. There was also new-onset diffuse erythema on the chest and back that was felt clinically to be a separate process, and a biopsy of the posterior neck showed eczematous dermatitis. In contrast, a biopsy of the central forehead showed vacuolar interface dermatitis with epidermal atrophy, subtly increased mucin, and a mid-dermal perivascular infiltrate. This biopsy was consistent with connective tissue disease, with a differential of lupus erythematosus versus DM. We then found that the patient's myositis-specific antibody panel was positive for anti-SAE antibodies. We therefore diagnosed the patient with DM based on the combination of antibody testing, clinical features, and biopsy findings. He was initially treated with hydroxychloroquine but developed a drug rash, a complication with known three-fold increased risk in anti-SAE DM. He has now experienced reduced erythema and pruritus with IVIG. In conclusion, we report a unique presentation of anti-SAE DM with atypical skin biopsy findings. The characteristic histologic features of DM are a mild vacuolar interface dermatitis, increased mucin, and a mild superficial lymphocytic infiltrate. DM typically lacks the deep perivascular inflammation seen in our biopsy, in contrast to lupus erythematosus. Based on this case, anti-SAE DM may have a histopathology more similar to lupus erythematosus than to other forms of DM. Further research is warranted to better understand the clinical and histopathologic features of this rare DM variant.

Teaching Point: Anti-SAE dermatomyositis may present with unusual pathologic features such as dermal perivascular inflammation, and correlation with clinical and laboratory findings is necessary to make an accurate diagnosis.

Category: Clinical Case

A.



B.

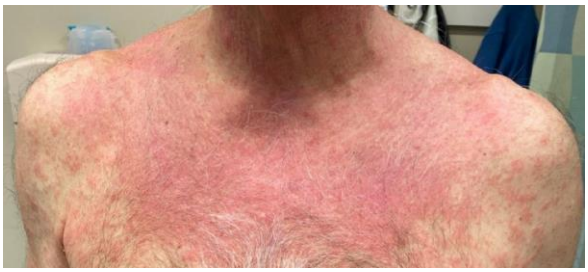


Figure 1: Clinical presentation of anti-small ubiquitin-like modifier-1 activating enzyme dermatomyositis

(A) Gottron papules with pink scaly plaques overlying knuckles; periungual erythema

(B) Violaceous rash on upper chest (pictured) as well as scalp and face

Poster Presentations

OTHER

RACIAL DISPARITY AND ALL-CAUSE MORTALITY IN CONNECTIVE TISSUE DISEASES

Ryan Murphy[1], Claire Hollins[2], MD, Matt Helm[2], MD

[1]Penn State Hershey College of Medicine, Hershey, PA, USA

[2]Department of Dermatology, Penn State Hershey Medical Center, Hershey, PA, USA

Email: rmurphy6@pennstatehealth.psu.edu

The connective tissue diseases (CTDs) systemic lupus erythematosus (SLE), systemic sclerosis (SS) and dermatomyositis (DM) are associated with racial disparities, including higher risk of diagnosis and/or disease severity among non-Whites. This population-based retrospective cohort study assesses if these CTDs are associated with racial disparities, as measured by all-cause mortality. Data were extracted from TriNetX. Control groups included patients with melanoma and squamous cell carcinoma (SCC). Experimental groups included patients with SLE, SS, or DM. All ages were included if ICD-10 code inclusion criteria were met. Patients were stratified by sex and race (Asian, Black, White). SAS Analytics Software was used for descriptive statistics and all-cause mortality at two-, three-, four-, five- and ten-year timepoints, using Whites as the control group. 41,991,543 patients were included (2.0% Asian, 12.8% Black, and 85.1% White). Black females had the highest prevalence of SLE and DM, while White females had the highest for SS. Asian males had the lowest prevalence for all CTDs. Regarding mortality ratios, only Blacks exhibited increased mortality across all timepoints for certain CTDs when compared to other races (Fig. 1). This applied to Black males and females with SLE (peaking at 1.65 and 1.76, respectively), females with DM (peaking at 1.54), and males with SS (peaking at 1.72) (Fig. 1). Asians exhibited increased mortality under the following conditions: two years for females with SLE (1.19), four years for females with DM (1.13), two-to-four years for males with DM (peaking at 3.62), four years for males with SS (1.13), and two years for females with SS (2.71) (Fig. 1). This study adds important nuance to mortality studies that focus on race alone, without considering sex, and provides as epidemiological update and an area for more research and improvement in health care.

PRESENCE AND PATTERNS OF CUTANEOUS IMMUNOFLUORESCENCE IN ANCA-ASSOCIATED VASCULITIS

R. Hal Flowers MD[1], Julian Stashower BS[2], Nakisa B. Sadeghi MPH[3], Kingsely Odega BS[2], Matthew F. Helm, MD[4], Vimal K. Derebail MD, MPH[5], Galen T. Foulke MD[4]

[1]University of Virginia School of Medicine, Department of Dermatology

[2]University of Virginia School of Medicine

[3]University of North Carolina School of Medicine

[4]Pennsylvania State University College of Medicine, Department of Dermatology

[5]University of North Carolina School of Medicine, Division of Nephrology and Hypertension

Corresponding author: nakisa_sadeghi@med.unc.edu

ANCA-associated vasculitis (AAV) is a systemic autoimmune disease with potential for severe impact to multiple organ systems. Renal involvement in AAV is common and is characterized in part by pauci-immune glomerulonephritis, with little to no immunoprecipitant observed on direct immunofluorescence (DIF) or electron microscopy. Up to half of patients may have skin involvement, manifesting as cutaneous small vessel vasculitis. In contrast to renal patterns, the authors have noted several patients with active immunoprecipitant on skin biopsy. In this multi-institutional retrospective study from the University of Virginia (UVA) and the University of North Carolina (UNC), we aim to investigate the prevalence of DIF positivity in patients with stereotypically pauci-immune AAV and explore the variation in patterns observed on DIF. We enrolled patients with ICD-10 codes for AAV, including granulomatosis with polyangiitis (GPA), eosinophilic granulomatous polyangiitis (EGPA), microscopic polyangiitis (MPA), polyangiitis, and unspecified arteritis/vasculitis, and who had undergone cutaneous DIF studies. 41 cases were included, confirmed by expert chart review. Five individuals were identified at UVA, and among them, three had positive DIF: two for IgM antibodies, with additional trace IgG and IgA in one; one with trace deposition of C3 with no enhancement of immunoglobulins; the remaining cases had no antibody or complement present. Cutaneous manifestations varied, ranging from tender purpuric vesicles and pustules in GPA to erythematous nodules in EGPA. We identified 36 additional patients from UNC. These cases will be presented upon completion of a data use agreement. While this study involves a limited dataset, it provides valuable insight into the possible diagnostic value of DIF in AAV and helps to further characterize cutaneous DIF findings in AAV.

Teaching Point: AAV may present with variable positivity and mixed patterns of immunoprecipitant staining on cutaneous DIF.

THE READABILITY OF ONLINE PATIENT EDUCATION MATERIALS FOR RHEUMATOLOGIC SKIN DISEASE

Sabrina Saeed, BA[1], Jeffrey Gehlhausen, MD[1], Sarika Ramachandran, MD[1]

[1]Department of Dermatology, Yale New Haven Health Systems, New Haven, CT

[2]Department of Rheumatology, Yale New Haven Health Systems, New Haven, CT

Email: sarika.ramachandran@yale.edu

Approximately 80 million US adults are estimated to have limited or low health literacy. It is therefore essential that patient education materials (PEMs) are written at a reading level that is comprehensible to all patients. Guidelines from the National Institute of Health (NIH) recommend that PEMs should not exceed a 6th grade reading level. While the readability of PEMs for various dermatologic conditions has been assessed, there is limited data on the comprehensibility of educational materials for cutaneous rheumatologic diseases. The objective of this study is to evaluate the readability of PEMs for five rheumatologic skin conditions. Google keyword searches were performed for "dermatomyositis," "scleroderma," "morphea," "vasculitis," "cutaneous lupus," and "skin lupus." The first fifty results from each search term were reviewed. Of these results, we excluded peer-reviewed journal articles, results that had insufficient public text for analysis, and those that were not PEMs. Seven validated readability tests were used to score each source including Flesch Reading Ease, Gunning Fog, Flesch-Kincaid, Coleman-Liau, SMOG Index, Automated Readability Index, and Linsear-Write. A composite score was calculated based on these seven indices. A total of 209 websites out of 300 assessed met the inclusion criteria. The average reading level of included PEMs was at or above an 11th grade level for all search terms and at a college level for dermatomyositis, scleroderma, and vasculitis. 82% of included websites were classified as "difficult" or "very difficult to read." Additionally, there were significantly fewer sources available for morphea, cutaneous lupus, and skin lupus as compared to the other search terms studied (21/50, 27/50, and 37/50 assessed vs. 39-43/50; $p<.001$). Based on our analysis, online education materials on cutaneous rheumatologic conditions often do not meet recommended readability guidelines. A greater effort should be made to produce materials at a reading level appropriate for all patients.