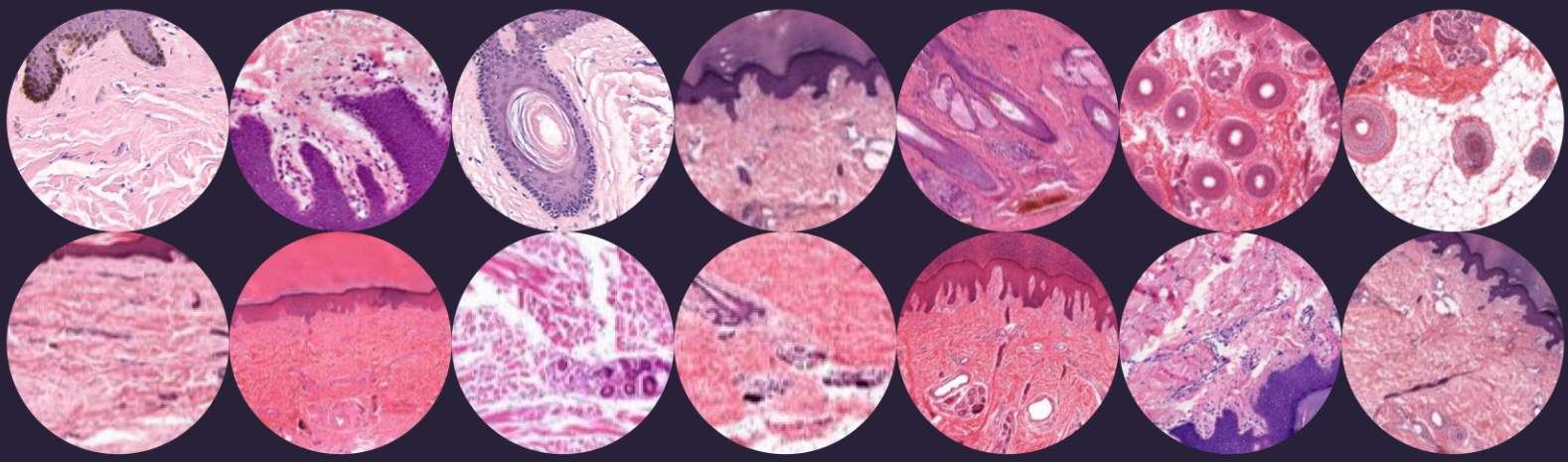
UBC Skin Research Day

Program Book & Abstracts | March 5, 2022



UBC Dermatology
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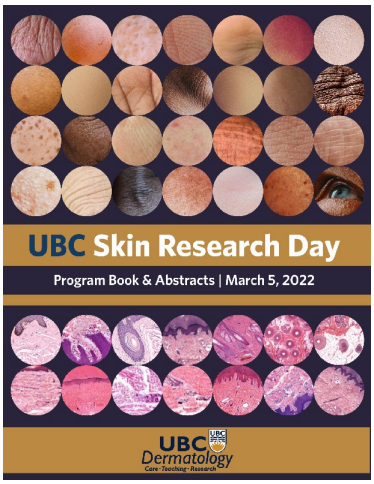

About the Cover

Skin research is all about what's above and what's below... the visible vs. the invisible. This year's cover is meant to illustrate that - a wide range of visible skin above the title, and the microscopic secrets it holds below. The one eye is multipurpose - it breaks the symmetry and invites your attention, it's also an important area for skin health, it directs you to look at the other skin images, and finally is a metaphor for Skin Research Day itself - opening our eyes to the research being done by our colleagues all around us.
Cover credit: David Stambler

UBC Department of Dermatology and Skin Science

Our Mission

To create and advance meaningful knowledge of the skin and its disorders through exemplary patient care and excellence in education and research at the provincial, national, and international levels.

derm.ubc.ca

We acknowledge the support of our teaching hospitals and research institutes at UBC

Research at UBC has been generously supported by numerous agencies and foundations including

Acknowledgements

We gratefully acknowledge the support of the following sponsors who have provided educational grants to support the 2022 UBC Skin Research Day.

Opening Remarks (9:00 – 9:05 AM)

Dr. Jan Dutz

Oral Presentation I (9:05 – 10:25 AM)

Moderators: Dr. Julia Mayba & Dr. Ilya Mukovozov

9:05 AM **THE IMPACT OF COVID-19 ON THE DIAGNOSIS OF MELANOMA IN BRITISH COLUMBIA**
Marie O'Connor, Richard I. Crawford

9:13 AM **INHIBITION OF TISSUE RESIDENT MEMORY-T CELLS AS A THERAPY FOR CONTACT HYPERSENSITIVITY**
Touraj Khosravi-Hafshejani, Mehran Ghoreishi, Jan P. Dutz

9:21 AM **WHEN TANNING IS TRENDING: A CONTENT QUALITY STUDY OF SKIN CANCER ON TIKTOK**
Valerie C. Doyon, Harry (Chaocheng) Liu, Kristy Bailey and Katie Beleznay

9:29 AM **GENERATING CLINICAL IMAGES OF SKIN DISORDERS FOR PATIENTS OF COLOR USING A STYLE-BASED GENERATIVE ADVERSARIAL NETWORK**
Umar Ali, Daniel C. Louie, Yuheng Wang, Andy Zhao, Harvey Lui, Sunil Kalia, Tim K. Lee

9:37 AM **ADVERSE CUTANEOUS EVENTS OF LOW-DOSE METHOTREXATE: A SYSTEMATIC REVIEW**
Jessica S.S. Ho, Touraj Khosravi-Hafshejani, Katie C.Y. Yeung, Jan P. Dutz

9:45 AM **DEVELOPING RISK PREDICTION MODELS: STEPS TOWARDS TARGETING INDIVIDUALS AT HIGHER RISK FOR SKIN CANCER**
Jenny Lee, Tim K. Lee, Tashmeeta Ahad, Harvey Lui, Jianhua Zhao, Haishan Zeng, Sunil Kalia

9:53 AM **TRANSMISSION OF ONYCHOMYCOSIS BETWEEN HOUSEHOLD MEMBERS: A SCOPING REVIEW**
Aria Jazdarehee, Leilynaz Malekafzali, Jason Lee, Richard Lewis, Ilya Mukovozov

10:01 AM **QUANTIFICATION OF IMAGE FOCUS: A PROOF OF CONCEPT STUDY TO IMPROVE IMAGE QUALITY IN TELEDERMATOLOGY**
Ali Majd, Tim K. Lee

10:09 AM **PREVALENCE OF CONTACT ALLERGY TO NICKEL: A RETROSPECTIVE CHART REVIEW**
Ilya M. Mukovozov, Nadia Kashetsky, Gillian de Gannes

10:17 AM **FOLLOW-UP OF PATIENTS WITH KERATINOCYTE CARCINOMA: SYSTEMATIC REVIEW OF CLINICAL PRACTICE GUIDELINES**
Sara Mirali, Evan Tang, Aaron M Drucker, Jennifer Beecker, Robert Bissonnette, Helen Catherall, Melinda Gooderham, Nicole Hawkins, Chih-Ho Hong, Nick Levell, Jo-Ann Lapointe McKenzie, Kim Papp, Irina Turchin, An-Wen Chan

5 Minutes Stretch Break (10:25 – 10:30 AM)

Speed Poster Presentation (10:30 – 10:50 AM)

Moderators: Dr. Saima Ali & Mr. Yuheng Wang

1 **DO PHONE CALL REMINDERS IMPACT PATIENT NO-SHOWS AT AN INNER-CITY DERMATOLOGY CLINIC?**
Saima Ali, Clifford Neil Kitson

2 **STOKES VECTOR POLARIZATION SPECKLE ANALYSIS FOR IN VIVO SKIN LESION EVALUATION**
Daniel C. Louie, Lioudmila Tchvialeva, Tim K. Lee

3 **INTERNAL MEDICINE MEETS EXTERNAL MEDICINE: SURVEY OF DERMATOLOGY EDUCATION FOR INTERNAL MEDICINE RESIDENTS**
Linda Zhou, Valerie C. Doyon, Sheila Au

4 **MELOLABIAL TRANSPOSITION FLAPS FOR THE REPAIR OF LARGE NASAL ALA AND ALAR RIM DEFECTS; A SINGLE CENTRE REVIEW OF OUTCOMES**
Angela Burleigh, David Zloty

5 **MODULAR LEARNING MATERIALS TO FACILITATE AND ENHANCE TELEDERMATOLOGIC SERVICE IN RURAL BRITISH COLUMBIA**
Jamie Phillips, Neil Kitson, Catherine Lim

6 **ALLERGIC CONTACT LIP CHEILITIS: DATA FROM THE CONTACT DERMATITIS CLINIC AT ST. PAUL'S HOSPITAL, 2016-2021**
Lisa Flegel, Gillian de Gannes

7 **END-TO-END DEEP LEARNING-BASED DENOSING FOR IN VIVO MULTIPHOTON MICROSCOPY IMAGING**
Giselle (Yunxian) Tian, Zhenguo Wu, Harvey Lui, Jianhua Zhao, Sunil Kalia, Tim Lee, Haishan Zeng

8 **CHILBLAIN-LIKE LESIONS (CLL) ASSOCIATED WITH COVID-19 ("COVID TOES'): A SYSTEMATIC REVIEW**
Nadia Kashetsky, Ilya M. Mukovozov, James Bergman

9 **ANALYSIS OF SUN SAFETY ATTITUDES AND BEHAVIORS AMONG CANADIANS BY SKIN TYPE**
Manish Toofany, Sunil Kalia

10 **MED SAFE CLINIC: A NOVEL INTERDISCIPLINARY APPROACH TO PATIENTS WITH SEVERE CUTANEOUS ADVERSE REACTIONS**
Arun Dhir, Harry (Chaocheng) Liu, Wan-Chun Chang, Marisa Ponzo, Bruce Carleton, Raymond Mak

11 **LABEL-FREE MULTIPHOTON MICROSCOPY IMAGING FOR GUIDING SKIN BASAL CELL CARCINOMA SURGERY**
Zhenguo Wu, Sunil Kalia, Tashmeeta Ahad, Yunxian Tian, Jianhua Zhao, Harvey Lui, Haishan Zeng

12 **THE CONNECTION OF EOSINOPHILIC GASTROENTERITIS AND EOSINOPHILIC DERMATITIS - TWO SIDES OF THE SAME COIN?**
Leilynaz Malekafzali, Bibi Naghibi Torbati, Fahd Jowhari

13 **PROCEEDING WITH PATCH TESTING AFTER CONSULTATION FOR ALLERGIC CONTACT DERMATITIS IN BRITISH COLUMBIA**
Julia Mayba, Marie O'Connor, Gillian de Gannes

14 **"THE PHOTOGRAPH IS OUT OF FOCUS. AGAIN!" A SINGLE REFERRAL CENTRE'S TELEDERMATOLOGY EXPERIENCE: A QUALITY-IMPROVEMENT STUDY**
Ian T.Y. Wong, Neil Kitson

15 **5 YEARS OF PEDIATRIC SKIN BIOPSY STATISTICS FROM THE DIVISION OF DERMTOLOGY AT BC CHILDREN'S HOSPITAL**
Matthew Roberts, Wingfield Rehmus

16 **EXPLORING CONTINUING MEDICAL EDUCATION VIA TELE-DERMATOLOGY CONSULTS FOR RURAL PHYSICIANS**
Rory Sutherland, Neil Kitson

17 **THE SKIN TONE HUE: A QUANTIFIABLE METRIC FOR DESCRIBING SKIN COLOUR**
Andy Zhao, Daniel C. Louie, Yuheng Wang, Umar Ali, Harvey Lui, Sunil Kalia, Tim K. Lee

18 **INTEGRATING DERMATOLOGY SERVICES INTO A SOCIAL PEDIATRICS NETWORK: 8 YEARS OF EXPERIENCE IN THE RICHER (RESPONSIVE, INTERDISCIPLINARY/INTERSECTORAL, CHILD/COMMUNITY, HEALTH, EDUCATION, AND RESEARCH) PROGRAM**
Wingfield Rehmus, Misha Zarbafian, Saud Alobaida, Clea Bland, Denise Hanson, Gwyn McIntosh, Kristina Pikksalu, Christine Loock

19 **ORAL TRANEXAMIC ACID TREATMENT LONGER THAN 6 MONTHS FOR MELASMA PATIENTS: A RETROSPECTIVE CASE SERIES**
Kaitlyn Lam, Danny Mansour, Allison Sutton

20 **IGA AUTOANTIBODIES TARGET PULMONARY SURFACTANT IN COVID-19 PATIENTS**
Omar Hasan Ali, Tobias Sinnberg, Christa Lichtensteiger, Oltin T. Pop, Mara Gilardi, Lorenz Risch, David Bomze, Philipp Kohler, Pietro Vernazza, Werner C. Albrich, Christian R. Kahlert, Silvio D. Brugger, Marie-Therese Abdou, Carl Zinner, Alexandar Tzankov, Martin Röcken, Lukas Kern, Martin H. Brutsche, Hubert Kalbacher, Ana Velic, Boris Maček, Josef M. Penninger, Matthias S. Matter, Lukas Flatz

Poster Viewing & Scavenger Hunt (10:50 – 11:20 AM)

Poster Q&A & Voting (11:20 – 11:35 AM)

Please submit your Scavenger Hunt by 11:35 AM

Oral Presentation II (11:35 AM – 12:55 PM)

Moderators: Dr. Linda Zhou & Mr. Daniel Louie

11:35 AM **GRANZYME B CONTRIBUTES TO THE DISEASE SEVERITY OF RADIATION DERMATITIS**
Megan A. Pawluk, Sho Hiroyasu, Layla Nabai, Brennan Wadsworth, Yue Shen, Kevin L. Bennewith, David J. Granville

11:43 AM **VIABILITY AND COSMESIS OF RIGHT ANGLE AND VERTICAL PARAMEDIAN FOREHEAD FLAPS ARE EQUIVALENT: A RETROSPECTIVE QUANTITATIVE STUDY**
Ilya M. Mukovozov, Alexandre Laroche, Aaron Wong, David Zloty

11:51 AM **GRANZYME K CONTRIBUTES TO IMPAIRED CUTANEOUS INFLAMMATION AND EPIDERMAL PROLIFERATION IN PSORIASIS**
Katlyn Richardson, Christopher Turner, Lorenz Nierves, Hongyan Zhao, Angela Burleigh, Megan Pawluk, Layla Nabai, Philipp Lange, Richard Crawford, David Granville

11:59 AM **LIGHT AND LASER-BASED TREATMENTS FOR HIDRADENITIS SUPPURATIVA: A SYSTEMATIC REVIEW**
Sara Mirali, Ilya M. Mukovozov, Sophie Khaslavsky, Sunil Kalia

12:07 PM **IS THE CANCER REGISTRY COMPLETE FOR ALL SKIN CANCER CASES? A COMPARISON OF THE BRITISH COLUMBIA CANCER REGISTRY TO HEALTH ADMINISTRATIVE CLAIMS-BASED ALGORITHMS FOR ASCERTAINING KERATINOCYTE CARCINOMA**
Thomas JX Zhang, Tim K. Lee, Harvey Lui, Sunil Kalia

12:15 PM **SAFETY AND EFFICACY OF ONCE- VERSUS TWICE-WEEKLY ULTRAVIOLET PHOTOTHERAPY REGIMENS IN PATIENTS WITH PSORIASIS AND ECZEMA**
Tashmeeta Ahad, Nadia Kashetsky, Sunil Kalia, Harvey Lui

12:23 PM **SKIN CANCER DETECTION BY RAMAN SPECTROSCOPY AND DEEP NEURAL NETWORKS: PRELIMINARY RESULTS**
Jianhua Zhao, Haishan Zeng, Sunil Kalia, Tim Lee, David McLean, Harvey Lui

12:31 PM **BARRIERS TO HEALTHCARE ACCESS FOR PATIENTS WITH PSORIASIS**
Yasmin Derayat, Jeffrey Toy, Allison Gregory, Wingfield Rehmus

12:39 PM **NEW APPROACHES TO OLD PROBLEMS - TREATMENT OF LENTIGINES: A SYSTEMATIC REVIEW**
Ilya Mukovozov, Jordanna Roesler, Nadia Kashetsky, Allison Gregory

12:47 PM **CUTANEOUS CpG ADJUVANT CONDITIONING TO ENHANCE VACCINE RESPONSES**
Douglas A. Carlow, Jacqueline C.Y. Lai, Tobias R. Kollmann, Manish Sadarangani, Jan P. Dutz

Closing Remarks (12:55 – 1:00 PM)

Dr. Jan Dutz

ORAL PRESENTATION ABSTRACTS

9:05 AM

THE IMPACT OF COVID-19 ON THE DIAGNOSIS OF MELANOMA IN BRITISH COLUMBIA

Marie O'Connor[1], Richard I. Crawford[1,2]
[1]Department of Dermatology and Skin Science, and [2]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, BC, Canada.

Background: Melanoma is a potentially deadly skin cancer. Efficient detection, biopsy and excision are important. When there are delays in the management of melanoma, patients and the health care system experience increased morbidity, mortality and costs.

Objectives: On March 17th, 2020, a public health emergency was declared in British Columbia due to the global COVID-19 pandemic. Much of the healthcare system was affected, with thousands of cancelled surgeries and appointments. Many dermatologists and primary care providers switched to a predominantly virtual care model in an attempt to decrease spread of the virus.

Methods: The full impact of the pandemic on patient outcomes remains to be determined. We hypothesized that the COVID-19 pandemic would result in a lower number of biopsies of melanoma and a higher number of patients with more advanced melanoma at diagnosis. To address these hypotheses, we initially conducted a retrospective review of 14 months of pathology reports for melanomas diagnosed in the BC lower mainland in 2019 and 2020. We have now completed a review of a full 24 months of pathology reports, comparing the periods of March 2019-Feb 2020 to March 2020-Feb 2021.

Findings: A preliminary summary of the early results of this study was presented at the 2021 UBC Research Day. This year, we will present results of our full data analysis of 10,117 pathology reports, including 1239 invasive cutaneous melanomas within the study period.

Conclusions: This study provides insight into the impact of the COVID-19 pandemic in British Columbia. It will help with understanding the adaptability of the healthcare system in BC and provide planning information in anticipation of future pandemics.

Category: Early experiments with well-defined objectives/hypotheses

9:13 AM

INHIBITION OF TISSUE RESIDENT MEMORY-T CELLS AS A THERAPY FOR CONTACT HYPERSENSITIVITY

Touraj Khosravi-Hafshejani[1], Mehran Ghoreishi[1], Jan P. Dutz[1]
[1]Department of Dermatology and Skin Science, University of British Columbia, Vancouver, BC, Canada

Systemic therapy for eczema targets the immune system during active inflammation. Disease inevitably returns to previously inflamed skin due to the persistence of tissue resident memory T (Trm) cells responding to autoantigens/allergens. The survival of Trm cells is regulated by IL-15. We present a mouse model of recurrent contact hypersensitivity and suggest a novel approach to the treatment of inflammatory skin diseases through inhibition of Trm cells.

Mice were sensitized on the abdomen with the allergen 2,4-dinitrofluorobenzene (DNFB) (day -5), and then challenged on the ear on day 0. Mice then received peritoneal injections of IL-15-receptor neutralizing antibodies, twice a week for four weeks, and then re-challenged with DNFB on day-30. The control group received no antibodies. Ear swelling was measured every 12-hours for 96-hours post challenge. Ear skin was harvested 2-days (inflamed skin) and 15-days (healed skin) after DNFB ear re-challenge.

In the control group, the number of Trm cells and expression of IL-15-receptors increased in healed skin compared to inflamed skin post 30-day re-challenge ($p<0.05$). Following the 30-day DNFB re-challenge, the IL-15-receptor inhibitor group showed significantly less ear swelling ($p<0.05$) as well as significantly reduced number of Trm cells expressing IL-15 receptors in both inflamed and healed skin ($p<0.05$), compared to control.

Trm cells expressing IL-15-receptors accumulate in healed skin following inflammation. Inhibition of IL-15-receptors during disease quiescence prevents skin inflammation following allergen re-challenge, and correlates with a reduction of Trm cells expressing IL-15-receptors. This may be a novel strategy to prevent dermatitis recurrence and maintain long-term remission.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc)

9:21 AM

WHEN TANNING IS TRENDING: A CONTENT QUALITY STUDY OF SKIN CANCER ON TIKTOK

Valerie C. Doyon, BSc[1], Harry (Chaocheng) Liu, BSc, MD[2], Kristy Bailey, MD, FRCPC[3], Katie Beleznay, MD, FRCPC[2]

[1]Faculty of Medicine, University of British Columbia, 317-2194 Health Sciences Mall, Vancouver, BC.

[2]Department of Dermatology and Skin Science, University of British Columbia, Vancouver, BC.

[3]Medical Director, FCP Dermatology, 100 King St. W, Toronto, ON.

Introduction: TikTok is an increasingly popular video-based social media platform, especially amongst young adults. Dermatologists have also increasingly used this platform for providing educational content online. This novel study aims to analyze skin cancer content on TikTok.

Methods: A total of 600 videos were collected from two queries for *#skincancer*, one month apart. Two authors categorized videos by content and type. Educational videos were evaluated using PEMAT, a validated tool.

Results: Among 338 included videos, 21.3% presented medical content with a focus on skin cancer. 28.1% of videos aimed to raise awareness, mainly by recommending sunscreen and physician skin exams. Clothing and hats were rarely suggested. Photoprotection videos were viewed 7.6 times more than others ($p<0.001$). While 82.4% had healthy or neutral messaging, 18.6% of videos using *#skincancer* were actually pro-tanning, most commonly via tanning beds.

Among the 49 (14.5%) educational videos, average PEMAT scores were 79.6% and 53.1% for understandability and actionability, respectively. The inferior actionability score is primarily due to 41% of videos neglecting to provide a single measure consumers could take towards the prevention or detection of skin cancer. Common issues included not breaking down actions into steps, difficult to read text, and unclear photographs.

Conclusions: Given the substantial amount of misinformation and even dangerous content on TikTok, dermatologists on social media should create more high-quality educational content encouraging protective measures against skin cancer. In clinical practice, particularly in the adolescent population, screening for tanning behaviors and explicitly addressing the ongoing social pressure to tan is warranted.

Category: Early experiments with well defined objectives/hypotheses

9:29 AM

GENERATING CLINICAL IMAGES OF SKIN DISORDERS FOR PATIENTS OF COLOR USING A STYLE-BASED GENERATIVE ADVERSARIAL NETWORK

Umar Ali[1,2,3], Daniel C. Louie[1,2,3,4], Yuheng Wang[1,2,3,4], Andy Zhao[2,3,5], Harvey Lui[2,3,4], Sunil Kalia[2,3,4,6,7], Tim K. Lee[1,2,3,4]

[1]School of Biomedical Engineering, University of British Columbia, Vancouver, Canada [2]Departments of Cancer Control Research and Imaging Unit – Integrative Oncology Department, BC Cancer, Vancouver, Canada [3]Department of Dermatology and Skin Science, University of British Columbia, Vancouver, Canada [4]Photomedicine Institute, Vancouver Coastal Health Research Institute, Vancouver, Canada [5]Department of Computer Science, University of British Columbia, Vancouver, Canada [6]BC Children's Hospital Research Institute, Vancouver, Canada [7]Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, Vancouver, Canada

Introduction: Images are important in dermatology, including for the purposes of education and patient management. However, there is a lack of images with dark skin colored patients in teaching presentations, datasets, and scientific articles. Dataset biases such as these can lead to cognitive biases that contribute to underdiagnosis of skin conditions in patients of color. Thus, there exists a need for a more diverse representation of skin color for dermatology images.

Objectives: To investigate the use of deep learning in creating clinical images of patients of color.

Methods: We leveraged a deep learning model, a style-based generative adversarial network, to generate images from a random seed into a desired image using example training images**.** We used a dataset of clinical images, containing 260 different skin diseases, across varying skin conditions. We then decomposed the training images into 512 features where the model would then generate new images from that feature set as well as translate existing images.

Results: The model was able to both successfully generate convincing skin patch images of varying skin disorders and translate those same images to capture relevant features in dark skin clinical presentation.

Conclusions: Leveraging this deep learning model to synthesize completely novel images of dermatological conditions in dark skin patients is potentially a useful tool to improve the diversity of skin image datasets, and facilitate dermatological education in treating patients of color.

Category: Early experiments with well defined objectives/hypotheses

9:37 AM

ADVERSE CUTANEOUS EVENTS OF LOW-DOSE METHOTREXATE: A SYSTEMATIC REVIEW

Jessica S.S. Ho[1], Touraj Khosravi-Hafshejani[2], Katie C.Y. Yeung[1], Jan P. Dutz[2]
[1] School of Medicine, Queen's University, Kingston, ON, Canada
[2] Department of Dermatology and Skin Science, University of British of Columbia, Vancouver, BC, Canada

Methotrexate (MTX)-induced epidermal necrosis is a rare adverse effect (AE) of MTX use, characterized by Stevens-Johnson syndrome (SJS)/ toxic epidermal necrolysis (TEN)-like reactions, exfoliative dermatitis or skin necrosis. Low-dose MTX (up to 30mg/week) has been used safely to treat dermatological and rheumatological conditions for years. This systematic review aims to summarize reports of low-dose MTX-induced EN in dermatological and rheumatological conditions. EMBASE, Medline and CENTRAL were searched in October 2021 according to the PRISMA guidelines using the keywords, "skin ulcers" or "drug eruption" or "necrosis" and "methotrexate" or "amethopterin". In total, 109 studies were included (80 case reports, 19 case series, 8 retrospective reviews, 1 prospective comparative study and 1 randomized control trial), representing 233 patients with reactions to MTX. Of the patients, 55.0% were female and the average age was 57 years old. Overall, 135 (57.9%) patients were taking MTX for a dermatological condition, 84 (36.0%) for a rheumatological condition and 13 (5.6%) took MTX for another reason (including accidentally and due to suicidality). Among those with a dermatological condition, n=69 (51.1%) had ulcerations of lesional skin, while in those with rheumatological conditions, n=26 (31.0%) had ulcerations over trauma prone sites such as the hands, elbows, knees, axillary folds, and inner thighs. We illustrate the potential for adverse cutaneous effects of low-dose MTX and suggest that ulcerations occur over areas of high cellular turnover. In conclusion, clinicians should be aware of the possibility of MTX-induced EN and its various presentations to advise patients when starting MTX therapy.

Category: Pilot/exploratory experiments (for study design, hypotheses creation, etc.)

9:45 AM

DEVELOPING RISK PREDICTION MODELS: STEPS TOWARDS TARGETING INDIVIDUALS AT HIGHER RISK FOR SKIN CANCER

Jenny Lee[1, 2, 3], Tim K. Lee[1, 2, 3], Tashmeeta Ahad[1, 3], Harvey Lui[1, 3, 4], Jianhua Zhao[1, 3, 4], Haishan Zeng[1, 3, 4], Sunil Kalia[1, 2, 3, 5, 6]
[1]Department of Dermatology and Skin Science, University of British Columbia
[2]Cancer Control Research Program, BC Cancer, Vancouver, Canada
[3]Photomedicine Institute, Vancouver Coastal Health Research Institute, Vancouver, Canada
[4]Imaging Unit - Integrative Oncology Department, BC Cancer, Vancouver, Canada
[5]BC Children's Hospital Research Institute, Vancouver, Canada
[6]Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, Vancouver, Canada

Introduction: While screening facilitates early diagnosis, its use at the population level for skin cancer is costly. Identifying high risk individuals may provide a more effective strategy that enables more efficient use of healthcare resources. We aim to develop skin cancer risk prediction models applicable to individuals living in northern latitudes.

Methods: 1000 patients from the Skin Care Centre in Vancouver have been surveyed. Demographics, environmental exposures, medical history, phenotypic features, and sun exposure were collected through interviews to develop predictive models via logistic regression modeling.

Results: Preliminary analyses have been conducted using data from 530 patients (283 skin cancer cases and 247 controls). 65, 212, and 94 patients had a current or previous history of melanoma, basal cell carcinoma (BCC), and squamous cell carcinoma (SCC) respectively. Univariate regressions show that the strongest risk factors for **melanoma** were Fitzpatrick skin phototype (odds ratio [OR] 11.35 (95%CI: 2.35-204), and presence of lentigines (OR 7.94 (1.69-142)). The strongest predictors for **BCC** and **SCC** were presence of lentigines (OR 12.8 (4.63-53.3); 6.05 (1.83-37.4) respectively), history of actinic keratoses (OR 7.07 (4.53-11.4); 7.67 (3.84-17.5) respectively), and age ≥71 (OR 4.34 (2.81-6.80); 9.78 (4.95-21.7)) respectively. Other significant risk factors included: presence of (atypical) nevi and freckles for **melanoma**, and Fitzpatrick skin phototype, >20 adult/childhood sunburns, and light-colour eyes for **BCC**/**SCC**.

Conclusions: The study has identified risk factors to incorporate into skin cancer risk prediction models. Future directions include developing and validating the models using the full dataset for use in predicting skin cancer risk.

Category: Early experiments with well-defined objectives/hypotheses

9:53 AM

TRANSMISSION OF ONYCHOMYCOSIS BETWEEN HOUSEHOLD MEMBERS: A SCOPING REVIEW

Aria Jazdarehee[1], Leilynaz Malekafzali[1], Jason Lee[1], Richard Lewis[2,3], and Ilya Mukovozov[1,2]
[1] Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada
[2] Department of Dermatology and Skin Science, University of British Columbia, Vancouver, BC, Canada
[3] Kamloops Dermatology, Kamloops, BC, Canada

Background: Onychomycosis is a common fungal infection of the nail, caused by dermatophytes, non-dermatophytes, and yeasts. Predisposing factors include older age, trauma, diabetes, immunosuppression, and previous history of nail psoriasis or tinea pedis. Though many biological risk factors have been well characterized, the role of the environment has been less clear. Studies have found evidence of transmission in 44% to 47% of households with at least one affected individual, but the underlying mechanisms and risk factors for transmission of onychomycosis between household members are incompletely understood.

Methods: A scoping literature review was performed to characterize and summarize environmental risk factors involved in the transmission of onychomycosis within households.

Results: A total of 90 papers met the inclusion criteria, and extracted data was analyzed in an iterative manner. Shared household surfaces may harbor dermatophytes and provide sources for infection. Shared household equipment, including footwear, bedding, and nail tools, may transmit dermatophytes. The persistence of dermatophytes on household cleaning supplies, linen, and pets may serve as lasting sources of infection.

Conclusions: Our study provides an overview of factors contributing to the persistence and spread of onychomycosis among household members. Based on these findings, we provide recommendations that aim to interrupt household transmission of onychomycosis. Given the paucity of studies directly exploring the mechanisms behind household transmission, this study is limited to a broad overview of implicated factors. Further investigation of the specific mechanisms behind household spread is needed to break the cycle of transmission, reducing the physical and social impacts of onychomycosis.

Category: Pilot/exploratory experiments

10:01 AM

QUANTIFICATION OF IMAGE FOCUS: A PROOF OF CONCEPT STUDY TO IMPROVE IMAGE QUALITY IN TELEDERMATOLOGY

Ali Majd, MD[1], Tim K. Lee, PhD[1,2]
[1]Department of Dermatology and Skin Science, University of British Columbia, Vancouver, BC Canada
[2]Vancouver Coastal Health Research Institute, Vancouver, BC Canada

The use of teledermatology has been on the rise throughout the pandemic and continues to play an important role in the practices of many dermatologists. One of the greatest limitations that dermatologists face with teledermatology is that the photographs that are submitted by patients are not always in focus on the appropriate region of interest. This can introduce uncertainty and difficulty in rendering the correct diagnosis. In this proof of concept study, and with the assistance of computer vision, we have devised a technique for patients to be able to quantify the degree of sharpness or focus of an image, in order to allow them to submit dermatologic photographs that are in focus. The algorithm computes the ratio of high spatial frequency content to the low spatial frequency content of an image using Fast Fourier Transform in order to quantify image sharpness. We have further extended this focus-detecting algorithm to extract frames from a video containing a region of interest of a patient's skin, and to select the five frames with the highest quantitative focus. This technique can be used by patients to produce and transfer the most in-focus media to their dermatologist for facilitation of diagnosis and management. In the future, a real-time implementation of this algorithm on a smartphone could allow patients to be guided through the process of taking high quality in-focus dermatologic photographs through real-time feedback on modification of photography parameters, such as the distance of the camera to the skin and lighting.

Category: Pilot/Exploratory experiments

10:09 AM

PREVALENCE OF CONTACT ALLERGY TO NICKEL: A RETROSPECTIVE CHART REVIEW

Ilya M. Mukovozov[1*], Nadia Kashetsky[2*] and Gillian de Gannes[1,3]
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No recent studies reporting nickel sensitivity prevalence in Canadians exist. The aim of this study was to quantify nickel sensitivity prevalence in patients at a patch test clinic in Vancouver. This study is a retrospective chart review of 3263 patients patch tested for nickel sensitivity at our clinic in Vancouver between 2008 and 2020. In total, 24.3% (n = 792 of 3263) of patients were sensitive to nickel. Nickel sensitivity significantly increased over time from 24.3% to 27.9% from 2008 to 2020. Nickel-sensitive patients were significantly more likely to be women ($P < 0.001$), between the ages of 19 and 64 years ($P = 0.010$), and have dermatitis affecting the face ($P = 0.001$) and hands ($P = 0.001$). Nickel-sensitive patients were significantly less likely to be 65 years or older ($P = 0.001$) and have dermatitis affecting the legs ($P = 0.002$). Approximately half of nickel-sensitive reactions were new positive reactions at the second reading. Nickel sensitivity occurred in approximately one quarter of patients and significantly increased over time.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc)

10:17 AM

FOLLOW-UP OF PATIENTS WITH KERATINOCYTE CARCINOMA: SYSTEMATIC REVIEW OF CLINICAL PRACTICE GUIDELINES

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Introduction: Patients with keratinocyte carcinoma (KC) are at risk of developing recurrence, metastasis, and additional cutaneous malignancies. However, it is unclear how often patients should be seen for follow-up. We conducted a systematic review of clinical practice guidelines to summarize recommendations for dermatologic follow-up after a KC diagnosis.

Methods: We searched PubMed, MEDLINE, and Embase for guidelines containing follow-up recommendations after a KC diagnosis. Guideline quality was assessed using the AGREE II tool's 7-point system converted to a scaled domain score.

Results: Fourteen guidelines were included. The recommended overall follow-up duration ranged from a single visit to lifelong surveillance. Eleven guidelines stratified recommendations by tumour risk. For high-risk basal cell carcinoma (BCC), one guideline suggested follow-up every 3 months, while four recommended every 6 months. For low-risk BCC and guidelines without risk stratification, recommendations ranged from every 6-12 months. For high-risk squamous cell carcinoma (SCC), recommendations included various follow-up frequencies, spanning every 3 months (n=5 guidelines), 4 months (n=1), 6 months (n=6), or annually (n=4). For low-risk SCC, follow-up recommendations included annually (n=5), every 6 months (n=3), or every 3 months (n=1). One SCC guideline did not use risk stratification and recommended annual screening. The highest scoring AGREE II domain was "scope and purpose" (mean domain score=71.2%±23.8), which assessed the guideline's overall objectives, and the lowest was "applicability" (mean domain score=18.2%±18.1), which assessed guideline implementation.

Conclusions: There was little consensus among guidelines on the appropriate follow-up schedule for KC patients. Randomized trials are necessary to define an optimal follow-up regimen.

Category: Early experiments with well-defined objectives/hypotheses

11:35 AM

GRANZYME B CONTRIBUTES TO THE DISEASE SEVERITY OF RADIATION DERMATITIS

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Rationale: Radiation dermatitis (RD) is characterized by skin damage that occurs in up to 95% of patients receiving radiation therapy for cancer treatment. The efficacies of current treatments vary and RD symptoms can impede radiation treatments. Granzyme B (GzmB) is a serine protease expressed and secreted by diverse immune and non-immune cell populations into the extracellular matrix. GzmB is elevated in the skin of patients with atopic dermatitis, cleaves cell-cell junction protein E-cadherin, and mediates barrier dysfunction and dermatitis severity in vivo.

Hypothesis: GzmB contributes to increased severity of RD through cleavage of cell-cell junction protein E-cadherin, resulting in impaired epidermal barrier function.

Results: Elevated GzmB and reduced E-cadherin were observed using immunohistochemistry in skin tissues obtained from patients with RD compared to healthy controls. In an established murine model of RD comparing GzmB knockout (GzmB-KO) to wild type (WT) mice, GzmB-KO mice exhibited a significant decrease in overall RD severity score compared to WT mice at day 4 ($p=0.03$), day 6 ($p=0.02$), day 8 ($p \leq 0.001$), day 10 ($p=0.01$), and day 12 ($p=0.01$) post-radiation. Significant reductions in erythema, scaling, and area of crusted wounds were also observed in GzmB-KO mice between days 4 and 12. Future studies will examine the efficacy of a topical GzmB inhibitor in reducing GzmB proteolytic activity and RD severity.

Significance: GzmB contributes to severity of RD and may be a novel therapeutic target.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc)

11:43 AM

VIABILITY AND COSMESIS OF RIGHT ANGLE AND VERTICAL PARAMEDIAN FOREHEAD FLAPS ARE EQUIVALENT: A RETROSPECTIVE QUANTITATIVE STUDY

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Background: Paramedian forehead flaps (PMFF) are commonly used for reconstruction of nasal defects. The classic PMFF is vertically oriented, while the modified PMFF is designed with a 90-degree angle. No study has compared outcomes between these PMFF designs.

Objectives: To compare and quantify viability and cosmesis of 90-degree and vertical PMFF.

Methods: Retrospective chart review of 70 consecutive patients with a vertical or 90-degree PMFF design for nasal repairs following Mohs micrographic surgery (MMS). Cosmetic outcome was assessed on a 10 cm, 100-point, visual analog scale (VAS) by an independent observer using standardized 3-month post-operative photographs. Flap viability was assessed using standardized 3-week post-operative photographs. Descriptive statistics, t-test and Mann Whitney test were used for statistical analysis.

Results: Forty-eight patients were repaired with a vertical PMFF and 22 using the 90-degree PMFF. Mean defect area of vertical and 90-degree designs was equivalent (7.7 ± 4.0cm^2 vs 8.1 ± 4.0cm^2, p=0.70). There was no significant difference in cosmetic outcome (75.9 ± 9.4 vs 72.9 ± 6.8, p=0.19), or flap viability (3.8% ± 11.6 vs 2.6% ± 7.9, p=0.67) between vertical and 90-degree designs.

Conclusions: Vertical and 90-degree PMFF designs for nasal repairs following MMS are equivalent in terms of cosmesis, flap viability, and rates of complications.

Category: Early experiments with well-defined objectives/hypotheses

11:51 AM

GRANZYME K CONTRIBUTES TO IMPAIRED CUTANEOUS INFLAMMATION AND EPIDERMAL PROLIFERATION IN PSORIASIS

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Background: Psoriasis is characterized by skin inflammation and epidermal proliferation forming thick, scaly plaques. Current therapies are not ideal and often present with side effects. Hence, a deeper understanding of the pathological mechanisms of psoriasis are necessary. Granzyme K (GzmK) is a serine protease recently elucidated as a mediator of inflammation. Here, we show the role of GzmK in cutaneous inflammation and epidermal proliferation following induction of psoriasis.

Hypothesis: GzmK contributes to the onset and progression of psoriasis through the augmentation of inflammation and/or epidermal proliferation.

Methods: GzmK levels were evaluated histologically in skin biopsies with and without psoriasis. The role of GzmK was investigated in a murine model of psoriasis, comparing GzmK knockout (K-KO) to wild-type (WT) mice. Psoriasis severity (erythema, squamae) was assessed macroscopically. Skin tissue extract were examined for pro-inflammatory markers and epidermal thickness via histology, ELISA and qPCR. To elucidate a mechanistic role, human keratinocytes were cultured with GzmK for assessment of epidermal proliferation and to define the GzmK degradome as it pertains to the epidermis.

Results: GzmK positive cells were elevated 40-fold (p=0.045) in lesional psoriasis skin compared to healthy skin. K-KO mice exhibited an average 60% decrease in plaque severity compared to WT mice. Pro-inflammatory cytokines IL-17 and IL-23 were reduced 46% (p=0.044) and 48% (p<0.001) in K-KO mice, respectively. K-KO mice also exhibited a 30% decrease (p=0.014) in epidermal thickness compared to WT mice. In vitro, GzmK induced keratinocyte proliferation.

Conclusions: Inhibition of GzmK may represent a novel therapeutic approach for treating psoriasis.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc.)

11:59 AM

Light and Laser-based Treatments for Hidradenitis Suppurativa: A Systematic Review

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Introduction: Hidradenitis suppurativa (HS) is a chronic folliculitis characterized by painful, recurrent lesions occurring mainly in intertriginous areas. HS is primarily managed by modifying lifestyle risk factors, medical, and procedural therapy. The aim of this systematic review was to critically assess HS treated with light or laser-based therapies and characterize their relative effectiveness.

Methods: Cochrane, MEDLINE, and Embase were searched for articles describing laser and light-based treatments for HS.

Results: Data from 41 studies representing 668 patients were extracted and analyzed The most commonly used treatments were carbon dioxide (CO_2) laser (59%, n=396/668), photodynamic therapy (PDT) (25%, n=167/668), and Nd:YAG laser (14%, n=92/668). Among those with reported treatment outcomes, CO_2 laser was effective in 79% (n=311/396) of patients, PDT in 71% (n=118/167), and Nd:YAG laser in 86% (n=30/35). Adverse events were reported in 26% (n=103/393) of patients treated with CO_2 laser, 15% (n=8/53) Nd:YAG, and 36% (n=23/64) PDT. Lasers used for surgery were more effective compared to lasers used for field treatment, showing overall response rates of 80% (n=344/431) and 71% (n=84/118), respectively. However, lasers used for surgery showed higher adverse event rates (25%, n=105/424) compared to laser field treatment (18%, n=24/134). Limitations included a lack of comparative randomized clinical trials, treatment being offered at different HS stages, and the use of different outcome measures.

Conclusions: Our results suggest that light and laser-based treatments are effective in treating HS patients. Larger comparative studies with standardized outcome assessments are needed to compare the efficacy of these devices to medical therapy.

Category: Early experiments with well-defined objectives/hypotheses

12:07 PM

IS THE CANCER REGISTRY COMPLETE FOR ALL SKIN CANCER CASES? A COMPARISON OF THE BRITISH COLUMBIA CANCER REGISTRY TO HEALTH ADMINISTRATIVE CLAIMS-BASED ALGORITHMS FOR ASCERTAINING KERATINOCYTE CARCINOMA

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Keratinocyte carcinomas (KCs) are the most common human malignancy in North America, with 1 in 7 individuals being affected in British Columbia (BC). However, these incident cases are diagnosed and treated in diverse settings and may not be sent for histopathological verification. Thus, KCs are often excluded from cancer registries which limit healthcare burden assessments. A systematic review of the scientific and grey literature suggests there is a lack of completeness in KC case records in cancer registries. The BC Cancer Registry claims to have officially coded and recorded all pathologically confirmed KC cases between 1970 and 1994 and then again in 2003. Therefore, we aimed to compare methods of KC ascertainment using previously validated health insurance claims-based algorithms to the BC Cancer Registry data, and to verify the completeness of the BC Cancer Registry for KC cases in the study period of the years January 1, 1992 to December 31, 1993, and January 1, 2002 to December 31, 2003. We currently have access to KC data within the Medical Services Plan (MSP) and the BC Cancer Registry databases through Population Data BC. Factoring in a margin of error for each ascertainment method, the ascertainment performance (sensitivity, specificity, positive predictive value, negative predictive value) and the percentage of ascertained KC cases will be assessed. We hypothesize that the BC Cancer Registry has an incomplete record of KCs, and that health insurance claims will be a reasonable alternative ascertaining KCs for epidemiological purposes.

Category: Early experiments with well-defined objectives/hypotheses

12:15 PM

SAFETY AND EFFICACY OF ONCE- VERSUS TWICE-WEEKLY ULTRAVIOLET PHOTOTHERAPY REGIMENS IN PATIENTS WITH PSORIASIS AND ECZEMA

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Background: During the COVID-19 pandemic, public health directives necessitated that our patients were restricted to reduced once- or twice-weekly phototherapy treatment regimens over 10-week cycles with higher incremental dosing.

Objectives: Safety and efficacy assessment of once- versus twice-weekly ultraviolet phototherapy regimens for psoriasis and eczema patients.

Methods: Psoriasis (n=492) and eczema (n=271) patients treated at the VGH Phototherapy Clinic between June 2020-August 2021 were assessed. Disease severity was assessed using two previously validated outcome parameters: (1) investigator global assessment times body surface area (IGA*x*BSA), and (2) Dermatology Life Quality Index (DLQI).

Results: Over 30 weeks, erythema higher than grade 1 occurred in 14% and 18% of psoriasis treatments, and 13% and 19% of eczema treatments for once- versus twice-weekly treatment groups. Overall, at 20 weeks, there was significant improvement in disease severity with 66% and 57% median IGAxBSA improvement from baseline ($p<0.001$, Wilcoxon matched-pairs signed-rank test). 39% and 57% of psoriasis patients, and 43% and 44% of eczema patients treated once- versus twice-weekly achieved 50% reduction in IGA*x*BSA, while 12% and 31% of psoriasis patients, and 19% and 13% of eczema patients treated once- versus twice-weekly achieved a 75% IGAxBSA response. Patients with both psoriasis and eczema achieved significant improvement in median DLQI after 10 weeks ($p<0.001$, Wilcoxon matched-pairs signed-rank test).

Conclusions: Reduced treatment frequencies utilizing higher incremental dosing improved disease severity and DLQI measurements. Twice- versus once-weekly treatment showed greater efficacy with slightly higher erythema rates. Differences in efficacy between frequency regimens were less pronounced in eczema patients.

Category: Early experiments with well-defined objectives/hypotheses

12:23 PM

SKIN CANCER DETECTION BY RAMAN SPECTROSCOPY AND DEEP NEURAL NETWORKS: PRELIMINARY RESULTS

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Background: Deep neural networks has been investigated to generate dermatologist-level classification for skin cancer diagnosis based on clinical images. Raman spectroscopy has been used for *in vivo* skin cancer detection with high sensitivity and specificity. The objective of this study is to explore skin cancer detection by combining deep neural networks and Raman spectroscopy.

Patients and Methods: *In vivo* Raman spectra of 340 cancerous and precancerous lesions including malignant melanoma, basal cell carcinoma, squamous cell carcinoma and actinic keratosis and 391 benign lesions including melanocytic nevi and seborrheic keratosis were analyzed in this study. The stratified samples were divided randomly into training (70%), validation (10%) and test set (20%). One-dimensional convolutional neural networks (1D-CNN) were developed for spectral analysis. Data augmentation was implemented with artificially added noise, spectral shift and spectral combination. Area under the receiver operating characteristic curve (ROC AUC) was used as a measure of the diagnostic performance. Multivariate statistical analyses, including logistic regression (LR), support vector machine (SVM), principal component and linear discriminant analysis (PC-LDA) and partial least squares for discriminant analysis (PLS-DA) were also evaluated for comparison purpose.

Results: Using the original training dataset, the ROC AUC of 1D-CNN (0.894±0.027) for the test set is slightly better than SVM (0.830±0.033), PC-LDA (0.884±0.025) and PLS-DA (0.884±0.029). After augmentation of the training dataset, 1D-CNN (0.887±0.025) produced similar diagnostic results with LR (0.886±0.025), SVM (0.885±0.024), PC-LDA (0.881±0.026) and PLS-DA (0.887±0.027).

Conclusions: Convolutional neural networks combining Raman spectroscopy produced equivalent or better performance for skin cancer detection than conventional multivariate statistical analyses.

Category: Applied/functional experiments (in vivo studies)

12:31 PM

BARRIERS TO HEALTHCARE ACCESS FOR PATIENTS WITH PSORIASIS

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Barriers to healthcare access (BtHA) are factors that hinder a patient's access to treatment. Previous studies have shown that a substantial number of patients express dissatisfaction with their treatment and healthcare access, but little research has been done to characterize the types of BtHA experienced by psoriasis patients. We conducted a systematic review to examine the BtHA identified in the psoriasis literature. We categorized our findings as systemic, sociocultural, provider or individual barriers. Individual barriers appeared most often, followed by systemic, provider and sociocultural barriers, respectively. For individual barriers, themes of non-adherence, patient knowledge gaps, opinions about treatment side effects and dissatisfaction with their efficacy were found. Common systemic barriers included therapy costs and geography. Provider level barriers included a lack of culturally competent care, wait times, short appointment durations and and unwillingness to make referrals. Sociocultural barriers included reliance on traditional medications, language and limited levels of therapy knowledge or exposure for certain ethnic groups. Our findings are mostly consistent with the barriers identified in broader healthcare disparity literature, but certain knowledge gaps were noted. Firstly, fewer sociocultural barriers were identified in psoriasis literature compared to general disparity literature. Studies have suggested that psychological factors, prior negative healthcare experience and comorbidities could act as BtHA, but none were found in our review. Future research in this area is important for psoriasis given its psychological and physiological comorbidities. Further investigation into the different BtHA that may be specifically relevant to psoriasis patients and interventions to overcome those barriers is needed.

Category: pilot/exploratory experiments (systematic review)

12:39 PM

NEW APPROACHES TO OLD PROBLEMS - TREATMENT OF LENTIGINES: A SYSTEMATIC REVIEW

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Background: Lentigines are common, benign areas of skin pigmentation characterized by macular, uniform hyperpigmentation, often located on sun exposed areas of the skin, such as the dorsum of the hands, face, and arms. Treatments consist of topical and physical therapies, including chemical peels, lasers, intense pulsed light, and cryotherapy. A direct comparison of treatment methods and their efficacy is lacking.

Objectives*:* To compare treatment efficacy and adverse events for different treatment modalities for lentigines.

Methods*:* We performed a systematic review by searching Cochrane, MEDLINE and Embase. Title, abstract, full text screening, and data extraction were done in duplicate by three reviewers using Covidence. Treatment outcomes were scored as complete response, partial response, and no response.

Results*:* Forty-eight articles met the inclusion criteria, representing a total of 1763 patients. Overall, combination-based treatments showed the greatest frequency of cases with complete response (65%, n=299/458), followed by laser-based treatments (43%, n=398/910), topical retinoids (21%, n=12/57), cryotherapy (15%, n=25/169), and peels (6%, n=8/125). Adverse events occurred most commonly while using topical retinoids (82%, n=23/28), followed by combination-based treatments (44%, n=206/466), cryotherapy (33%, n=47/144), laser-based treatments (37%, n=310/846), and peels (19%, n=21/110).

Conclusions: Our results suggest that combination-based treatments and laser-based treatments were the most efficacious treatment modalities. Although cryotherapy was previously considered first-line, our results show that it has substantially lower pooled response rates compared to other treatment modalities.

Category: Early experiments with well-defined objectives/hypotheses

12:47 PM

CUTANEOUS CpG ADJUVANT CONDITIONING TO ENHANCE VACCINE RESPONSES

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Adjuvant activity of the Toll receptor 9 agonist CpG 1826 was compared when given subcutaneously (s.c.) together with ovalbumin (s.c. [CpG + Ova]), or when given by either s.c. or intradermally (i.d.) routes two days prior to s.c. ovalbumin. Frequencies of $CD8^+$ effector (T_{EFF}) and central memory (T_{CM}) T cells along with total IgG, IgG2c, and IgG1 titres were measured to ascertain how timing and location of CpG conditioning influenced vaccination outcome. Prior treatment with CpG enhanced T_{EFF}, T_{CM}, as well as total IgG responses. T_{EFF} and T_{CM} responses were greatest when CpG was given intradermally and prior to s.c. ovalbumin, conditions that eliminated the fraction of T_{CM} 'non-responders' observed after s.c.[CpG + Ova] vaccination. IgG responses were polarized toward IgG2c after early s.c. CpG but toward IgG1 after early i.d. CpG. Separating CpG adjuvant and antigen application in time and space can improve vaccination outcome.

Category: Applied/functional experiments (animal models, in vivo studies)

POSTER PRESENTATION ABSTRACTS

Poster 1

DO PHONE CALL REMINDERS IMPACT PATIENT NO-SHOWS AT AN INNER-CITY DERMATOLOGY CLINIC?

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Background: Same-day missed appointments, or patient no-shows, decrease accessibility, impact patient care and reduce provider productivity. Currently the average no-show rate in outpatient dermatology clinics is 17-30%. There remains a paucity of research examining how to minimize no-shows for inner-city clinics that service marginalized populations, many of whom face significant socioeconomic barriers to care.

Objectives: To determine the no-show rate at an inner-city dermatology clinic and assess whether the implementation of phone call reminders (PCR) reduces the no-show rate.

Methods: A retrospective medical record review was conducted to tabulate the number of clinic attendees and no-shows prior to and after the implementation of PCR. Average daily clinic no-show rates (DCNSR) were calculated and compared using Welch's test.

Results: The DCNSR prior to PCR was 45.7%. Phone call reminders were implemented over a 6-month period, of which 7 days were missed due to lack of administrative availability. The DCNSR after the implementation of PCR was not statistically significantly different at 36.7% *(p*=0.06). However, post hoc analysis excluding clinic days when reminders were not conducted, revealed a statistically significant lower no-show rate at 33.1% (*p*=0.01).

Conclusions: This inner-city dermatology clinic is greatly affected by patient no-shows, more so than what is quoted in the literature. In a realistic setting where reminders may be missed, our study revealed that PCR are not a statistically significant intervention. If done perfectly, however, PCR may be effective in reducing no-show rate. In the future, different interventions can be trialed to assess the impact on patient no-shows.

Category: Exploratory

Poster 2

STOKES VECTOR POLARIZATION SPECKLE ANALYSIS FOR IN VIVO SKIN LESION EVALUATION

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Background: Speckle is an optical interference pattern formed when laser light backscatters from a medium. Skin, as a translucent optical medium, produces highly complex speckle patterns. Skin surface and subsurface morphological properties both contribute to optical scattering that generates unique patterns, not just in light intensity distribution, but also in the speckles' polarization states. Polarization refers to the oscillation orientation of light waves and is a uniquely difficult optical property to measure due to its independence from optical intensity. The polarization state of light must be quantified by a four-element Stokes vector. To fully measure this Stokes vector and maximize the information gained from speckle pattern measurement, a novel device must be constructed.

Objective: This project introduces a device to measure the full polarization state of a speckle pattern from skin *in vivo*. Following acquisition, speckle properties quantifying both intensity distribution and polarization state are to be identified and linked to skin morphological properties through statistical, machine learning, and AI-driven methods.

Proposed Methods: The device will be constructed using a novel combination of liquid crystal polarization controllers and a pixel-polarization camera. Initial measurements on solid phantoms with controlled surface roughness and optical properties mimicking human skin will allow for understanding of differences in speckle due to surface and subsurface properties. Based on previous polarization studies, analysis of polarization speckle properties is expected to allow for quantifiable discrimination between malignant and benign tissues, for future applications in rapid cancer detection.

Category: Pilot/exploratory experiments

Poster 3

INTERNAL MEDICINE MEETS EXTERNAL MEDICINE: SURVEY OF DERMATOLOGY EDUCATION FOR INTERNAL MEDICINE RESIDENTS

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Introduction: Many systemic diseases present with cutaneous findings, yet there is a documented lack of dermatology training in internal medicine (IM) residency. We conducted a needs assessment survey to guide future dermatology education for IM.

Methods: A survey was sent to first, second, and third year UBC IM residents in 2021. A series of 9 questions were asked, including quantitative ratings of their experience and comfort levels in evaluating dermatologic presentations, such as "bullae" or "ulcers", and qualitative opinions regarding dermatology teaching.

Results: The response rate was 31% (53/171). In terms of residents' comfort levels, 70% (371/530) of clinical presentations were rated as "uncomfortable" or "very uncomfortable". On average, residents were most experienced and comfortable managing a "red leg" and least with "alopecia". With increasing seniority, residents encountered cutaneous diseases significantly more frequently (p=.002). Despite this, there were no significant differences in comfort levels based on level of training or previous experience.

In terms of dermatology-focused exam questions, 94% were "unconfident" to "not at all confident". Frequently requested teaching subjects were "common" and "dangerous" conditions, including drug eruptions, SJS/TEN, and morbilliform rashes. Preferred teaching modalities were consult templates, informal teaching, clinical rotations, as well as small group sessions and lectures, via morphology-based education.

Conclusions: Through all training levels, the majority of IM residents self-report a general lack of comfort with dermatologic presentations, despite an increasing frequency of encounters through their training. Residents are most interested in learning common and not-to-miss diagnoses, and preferred numerous modalities to do so.

Category: Early experiments with well-defined objectives/hypotheses

Poster 4

MELOLABIAL TRANSPOSITION FLAPS FOR THE REPAIR OF LARGE NASAL ALA AND ALAR RIM DEFECTS; A SINGLE CENTRE REVIEW OF OUTCOMES

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Reconstruction of large nasal ala and alar rim can prove challenging after Mohs Micrographic surgery. When alar defects involve the entire cosmetic subunit, or span into other cosmetic subunits, interpolation flaps are frequently utilized for repair. The obvious drawback to interpolated flaps are that they often require cartilage struts for additional support and require a second stage revision. In these scenarios, we recognize the value of the melolabial transposition flap and present our experience with this repair option.
We collected a series of 10 patients with large nasal defects repaired using the melolabial transposition flap with follow-up ranging from 3 to 48 months. The median age was 73 (range 62 to 86 years old) and size ranged from 1.9 x 1.5 cm to 3.2 x 2.7 cm. The alar rim was involved in 7 of 10 defects. At 1 week follow-up, dehiscence was noted in 2 of 10 patients with an underlying hematoma in 1 of these patients. There were no post-operative infections. Asymmetric thickening of the repaired alar required post-operative intralesional steroid in 8 of 10 patients. A second procedure to re-create the alar groove was performed in 2 of the 10 patients (it was scheduled for a third patient but not conducted). Dermabrasion was conducted in 1 of 10 patients for unacceptable scar lines.

Our patient cohort who underwent melolabial transposition for repair of large alar defects had satisfactory aesthetic and functional outcomes. We consider this to be a reliable method of repair for large alar defects including those involving the rim.

Category: Early experiments with well defined objectives/hypotheses

Poster 5

MODULAR LEARNING MATERIALS TO FACILITATE AND ENHANCE TELEDERMATOLOGIC SERVICE IN RURAL BRITISH COLUMBIA

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The UBC teledermatology service provides remote consultative expertise to family physicians in rural and remote locations in BC via various platforms including WelTel, Zoom and 8x8. The consult characteristics and patient demographics from May to December of 2020 were presented at last year's Skin Research Day; updated data from 2021 shows similar trends in terms of the most commonly diagnosed conditions, which include eczematous dermatitis, acneiform disorders, blistering conditions and cutaneous neoplasms. We present a quality improvement project focused on the use of supplemental learning materials that address the management of these frequently encountered diagnoses/clinical presentations, including advice on diagnostic measures, counselling, therapeutic approach and procedural interventions. The nature of the teledermatology service, in which we interact primarily with the family physician as opposed to the patient, presents unique challenges, but also creates an opportunity to provide ongoing dermatologic education to primary care providers, which we hope to leverage with resources such as these. At this time, the supplemental materials have been limited to concise "handouts" which can be appended to consult reports where they are relevant, in a modular fashion; however, in the future, we hope to expand these materials to include video or other formats. We also plan to explore various methods of disseminating these resources via multimedia messaging service (MMS), including use of image/video files or links to an online directory, and evaluate which is most effective and convenient for the target practitioners.

Category: Pilot/exploratory experiments

Poster 6

ALLERGIC CONTACT LIP CHEILITIS: DATA FROM THE CONTACT DERMATITIS CLINIC AT ST. PAUL'S HOSPITAL, 2016-2021

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Cheilitis has several potential causes, including atopic dermatitis, allergic or irritant contact dermatitis, actinic damage, other inflammatory disorders, and infections.

Patch testing is a method to identify contact allergy. Since the start of the Contact Dermatitis Clinic at St Paul's Hospital in November 2016, through to April 2021, 1289 patients were patch tested. There were 94 patients with lip dermatitis and 58 had lip as the sole area of involvement. There was a positive history of atopy (eczema, asthma, or allergic rhinoconjunctivitis) in 39/58 (67%) patients. Most patients were female (52/58, 90%) and the mean age was 38 years old (range 16-69).

Forty-four patients (76%) had positive patch test reactions and 41 (71%) of these were clinically relevant. The ten most common clinically relevant allergens were: nickel sulfate (19/58), cobalt chloride (9/58), hydroperoxides of linalool (9/58), fragrance mix I (7/58), *Myroxylon pereirae* (Balsam of Peru) (7/58), hydroperoxides of limonene (6/58), fragrance mix II (4/58), ammonium persulfate (4/58), dodecyl gallate (4/58), and benzoic acid (4/58).

Forty patients were patch tested to their personal products. Four patients had positive reactions, 13 had no positive reactions, and 23 were not recorded in the database and were assumed to be negative. Of the positive reactions 3 were to lip products.

The most frequent allergens seen in our clinic are comparable to previously published data, including from the North American Contact Dermatitis Group, as well as case series from Australia, Europe, and Asia.

Allergic contact cheilitis is an important cause of lip dermatitis to evaluate for.

Category: Pilot/Exploratory Experiments

Poster 7

END-TO-END DEEP LEARNING-BASED DENOSING FOR IN VIVO MULTIPHOTON MICROSCOPY IMAGING

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Multiphoton microscopy (MPM) is an invaluable tool for direct observation of dynamic processes in life science. However, live tissue imaging acquisition is fundamentally limited by microscope optics, fluorescence yields, and the maximum permissible exposure of the illuminating light. As a consequence, MPM images can be very noisy due to patients' involuntary movements or lack of spatial resolution, which severely hampers image interpretation. In recent years, deep learning (DL) has emerged as an effective approach for noise reduction. Different from classical methods which use pre-determined mathematical functions, DL methods learn the denoising function from training data, providing a content-aware approach. To address the unmet need of denoising MPM images, we present a new algorithm based on deep convolutional neural networks (CNNs). The proposed model is based on U-net structure. This model included multipile U-nets in which an individual U-net removes noises at different scales so that it improves the performance based on a coarse-to-fine strategy. We train this model using raw (low resolution) and 10 frames averaged (high resolution) paired images. Our dataset contains over ten thousands of MPM *in vivo* skin cell images from more than ten volunteers. To validate this method, mean square error (MSE) and structural similarity index measure (SSIM) will be calculated. This method will help with translating MPM images from bench-top systems to *in vivo* human skin imaging.

Category: Pilot/exploratory experiments

Poster 8

CHILBLAIN-LIKE LESIONS (CLL) ASSOCIATED WITH COVID-19 ("COVID TOES'): A SYSTEMATIC REVIEW

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Reports of chilblain-like lesions (CLL) coinciding with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection have been described in the literature, but this phenomenon has not been critically summarized. The aim of this paper is to summarize reports of CLL coinciding with SARS-CoV-2 infection to clarify the prevalence, clinical relevance, and prognostic value of these lesions. A literature search was conducted using the Embase, Pubmed, and Scopus databases from December 2019 to June 16, 2020 using the search terms ("COVID-19" OR "coronavirus" OR "2019-nCoV" OR "SARS-CoV-2") AND ("chilblain-like" OR "COVID toes" OR "acral"). Papers that described skin changes in patients with suspected or confirmed COVID-19 were included. A total of 31 papers were summarized, representing 813 cases of CLL. Available data suggests an equal gender distribution, mean age of 21 years, and median age of 14 years. Mild extracutaneous symptoms were reported in 53% of cases and 47% were asymptomatic. CLL occurred an average of 16 days after extracutaneous symptoms. Patients with CLL were positive for SARS-CoV-2 in 15% of cases. Lesions were mainly described as asymptomatic and/or pruritic erythematous to violaceous acral macules and plaques. Partial or complete resolution occurred in 85% of cases in a mean of 13 days. The most common histologic findings were perivascular and perieccrine superficial and deep lymphocytic infiltrates. Although a causal relationship between CLL and SARS-CoV-2 has not been confirmed, the temporal association and 15% positive SARS-CoV-2 rate in affected individuals should not be ignored.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc)

Poster 9

ANALYSIS OF SUN SAFETY ATTITUDES AND BEHAVIORS AMONG CANADIANS BY SKIN TYPE

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Skin cancer is the most commonly diagnosed cancer in Canada. While the risk for individuals of darker skin tones developing skin cancer is lower than those of lighter skin tones, it remains significant. A comprehensive understanding of the attitudes and beliefs relating to sun protection within this demographic can help inform more effective targeted public education initiatives. A dataset of 1228 responses collected from annual surveys of adult Canadians from 2019 was analyzed. The survey questions assessed 45 items related to Canadians' attitudes, beliefs, and behaviors surrounding sun safety. An analysis based on Fitzpatrick skin types was performed through calculating descriptive statistics and odds ratios for each attitude and belief. Individuals of skin types IV-VI were found to have less concern for risks associated with sun exposure relative to those with skin types I-III. Moreover, they were significantly more likely to believe that sunscreen use was not as important in the winter and for individuals of darker skin tones. Crucially, individuals of skin types IV-VI also reported fewer sun protective behaviors. Notably, they were significantly less likely to wear sunscreen, check the UV index, seek shade during peak hours of the sun, or wear sun protective clothing. The overall findings suggest that Canadian adults of skin types IV-VI tend to have riskier attitudes and behaviors towards sun exposure. This provides a basis for future public health messaging to be tailored to this demographic group where misinformation is more common.

Category: Pilot/exploratory experiments (for study design, hypotheses creation, etc)

Poster 10

MED SAFE CLINIC: A NOVEL INTERDISCIPLINARY APPROACH TO PATIENTS WITH SEVERE CUTANEOUS ADVERSE REACTIONS

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MED Safe is an innovative interdisciplinary clinic combining care from Allergy, Dermatology, and Clinical Pharmacology for patients with SCARs. Patients are referred to clarify the causative medications or to provide anticipatory guidance regarding safety of future medication exposure.

Patient A is a 15-year-old healthy male of European descent who was admitted for SJS. He took ibuprofen for flu-like symptoms and developed mucositis. He also completed 10 days of cephalexin for toe infection three weeks prior. After stopping all medications, his condition improved. *In vitro* lymphocyte toxicity assay (LTA) implicated ibuprofen but not cephalexin, suggesting ibuprofen-induced SJS. Patient B is a 32-year-old healthy female of East Asian descent who developed SJS after atovaquone and proguanil was taken for malaria prophylaxis. LTA to both drugs was positive, as well as subsequent testing to doxycycline. Both patients received pharmacogenetic testing to a panel of 10 evidence-based high-risk HLA markers to identify risk with specific medication-induced SCARs. Both showed positivity to HLA-A*32:01 and HLA-B*58:01 allele associated with developing SCARs to vancomycin and allopurinol, respectively, and were advised to avoid these medications. In patient A, confirmatory LTA to Vancomycin was positive. LTA to allopurinol is pending.

Pharmacogenetic screening to a panel of HLA genotypes for patients with SCARs may help stratify future risk with other high-risk medication exposures. LTA can not only help delineate the culprit drug for SJS, but also confirm genotype-phenotype correlation. Our interdisciplinary care model can potentially optimize care for patients with SJS and potentially other SCARs.

Category: Early experiments with well-defined objectives/hypotheses

Poster 11

LABEL-FREE MULTIPHOTON MICROSCOPY IMAGING FOR GUIDING SKIN BASAL CELL CARCINOMA SURGERY

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Basal cell carcinoma (BCC) is the most common cancer type among humans. The ideal goal for surgical treatment is for the tumor tissue to be excised completely while conserving as much normal tissue as possible to reduce disfigurement. Excisional surgery with delayed pathology reporting can lead to incomplete tumor removal, or excess normal tissue being removed. Mohs microscopy surgery based on onsite frozen section histopathology facilitates complete tumor removal with minimal normal tissue being removed but is a lengthy and costly procedure. We are aiming to develop a multiphoton microscopic imaging platform to provide instantaneous tissue examination onsite during BCC surgery. It will enable fast, label-free detection of residual cancer cells based on a nonlinear optical imaging approach. This platform will be designed to provide sub-cellular resolution tissue images with quality comparable to conventional histopathology. An algorithm will be developed to indicate the location of residual tumor cells to guide further excision as necessary. In this project, we will test the system for guiding shave removal of superficial BCCs first. If successful, the platform could be further developed for guiding excisional surgery and Mohs surgery in the future.

Category: Early experiments with well defined objectives/hypotheses

Poster 12

"THE CONNECTION OF EOSINOPHILIC GASTROENTERITIS AND EOSINOPHILIC DERMATITIS- TWO SIDES OF THE SAME COIN?"

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Eosinophilic gastroenteritis (EGE), characterized by eosinophilic infiltration in the GI tract, presents with non-specific gastrointestinal symptoms. Eosinophilic dermatitis involves inflammatory eosinophilic infiltration in the skin causing a pruritic rash. It is uncommon for EGE to affect the skin. We highlight the concurrent presentation of EGE and eosinophilic dermatitis, and the underlying immunological processes.

A 68-year-old female presented to hospital with a two-week history of epigastric pain, nausea, and vomiting. Over the past 15 years, she had three episodes of severe epigastric pain accompanied by a rash, all improving with short courses of Prednisone. She also had a history of hypogammaglobulinemia suspected to be due to protein losing enteropathy. On examination, an erythematous, pruritic, papular rash was noted on her left thigh. Laboratory studies revealed peripheral blood eosinophilia and hypoalbuminemia. Gastroscopy and targeted biopsies showed increased eosinophilic infiltration in foregut consistent with EGE. A punch biopsy of the rash showed eosinophilic infiltration in the dermis layer consistent with eosinophilic dermatitis. She was started on a tapering course of oral Prednisone 40 mg daily. The abdominal symptoms and the rash subsequently improved. A follow-up gastroscopy showed resolution of foregut mucosal changes.

Patients with EGE and a rash respond well to a defined course of tapering steroid therapy. The diagnosis of EGE is challenging as the findings are usually non-specific. Peripheral blood eosinophilia may be present and histopathological analyses confirm the diagnosis. A pruritic rash could be present and may relate to underlying immunological processes involving eosinophils, mast cells, Th-2 cells, and cytokines.

Category: Pilot/exploratory experiments

Poster 13

PROCEEDING WITH PATCH TESTING AFTER CONSULTATION FOR ALLERGIC CONTACT DERMATITIS IN BRITISH COLUMBIA

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Allergic contact dermatitis is caused by a delayed hypersensitivity reaction within the skin. It is diagnosed with patch testing, whereby allergic reactions are reproduced on the back over several days. In British Columbia, formal dermatologic patch testing is provided chiefly in Vancouver. As such, many patients within and outside of the lower mainland are referred for this service, which first requires consultation and is then followed by formal testing. Despite the utility in potentially identifying allergens these patients, there are patients who choose not to proceed with undergoing formal testing after their initial consultation.

Our aim was to determine the characteristics of patients who attended their initial patch testing consultation but chose not to proceed with formal testing.

We conducted a chart review of patients seen in consultation for patch testing between Jan. 2020 and Oct. 2021 inclusive, to determine which patients proceeded for patch testing thereafter.

Some highlights of our analyses of preliminary data from Jan. 2020 to June 2021 demonstrated 64% of patients from the lower mainland underwent patch testing after consultation, versus 52% of patient from outside of the lower mainland. Among patients seen in consultation virtually, 65% of lower mainland patients underwent testing, while 47% of patients from outside the lower mainland underwent testing.

We hope to better characterize which patients do not proceed with patch testing after consultation. Further study could be undertaken to identify specific factors causing patients to not undergo testing.

Category: Early experiments with well-defined objectives/hypotheses

Poster 14

"THE PHOTOGRAPH IS OUT OF FOCUS. AGAIN!" A SINGLE REFERRAL CENTRE'S TELEDERMATOLOGY EXPERIENCE: A QUALITY-IMPROVEMENT STUDY.

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Background: The coronavirus disease-2019 (COVID-19) pandemic has resulted in a rapid integration of teledermatology into clinical practice to provide patient care while mitigating in-person contact. Unlike in-person clinical visits, the quality of patient-submitted photographs for review are an integral component of the virtual patient encounter and diagnostic assessment. Anecdotal reports cite poor focus on pathology in submitted photographs as a major complaint contributing to a suboptimal dermatologic virtual assessment.

Objectives: This quality improvement (QI) study aims to evaluate the quality of patient-submitted photographs, specifically relating to image focus, to a single referral centre for teledermatology review over one year and to assess how the image focus of submitted photographs changed throughout the pandemic.

Results: From April 2020 to April 2021, 141 patients received teledermatology care and 905 patient-submitted photographs were reviewed. Over the 1-year period, the average proportion of image focus of all photographs submitted found that 13.4 ± 8.0% were not in focus, 23.9 ± 9.6% were in partial focus, and 62.7 ± 10.3% were in focus. The quality of patient-submitted photographs, specifically relating to image focus, was not found to demonstrate a noticeable pattern change from month-to-month.

Conclusions: Teledermatology has been and continues to be a well-utilized delivery of dermatologic care throughout the COVID-19 pandemic. Poor image focus may not be as a significant problem in teledermatology as anecdotally reported. A large proportion of photographs submitted by patients for teledermatology review were either partially in focus or completely in focus requiring none to minimal additional guidance or instruction.

Category: Early experiments with well-defined objectives/hypotheses

Poster 15

5 YEARS OF PEDIATRIC SKIN BIOPSY STATISTICS FROM THE DIVISION OF DERMTOLOGY AT BC CHILDREN'S HOSPITAL

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Objectives: To evaluate all skin biopsies from BC Children's Hospital over a 5-year period.

Methods: All skin biopsies signed out at BC Children's hospital between January 2016 and December 2020 were evaluated to include only biopsy reports submitted by members of the Division of Dermatology. Retrospective chart evaluation was completed amongst these patients with demographic and clinical data recorded.

Results: 239 biopsies were performed from 2016-2020; 54% of the biopsies were from male patients and 46% were from females; 29% of biopsies were in patients <5 years old, 25% from 5-9 years old, 31% from 10-14 years old, and 19% from patients 15 years or older; 22 biopsy procedures occurred on the face of patients 6 years or older, and 12 procedures occurred on the face of patients <6 years old; the most common histopathologic diagnostic categories included inflammatory dermatoses (40%), benign neoplasms (24%), vascular proliferations (12%), and malignant neoplasms (7%); prebiopsy clinical impressions were consistent with histopathologic diagnoses in 72%.

Conclusions: Skin biopsies were performed amongst patients of all age categories, with a large proportion occurring in those under 5 years of age. Biopsies were mostly necessary for inflammatory dermatoses and benign neoplasms, with clinicopathologic concordance in nearly 3 out of 4 cases.

Category: Pilot/exploratory experiments

Poster 16

EXPLORING CONTINUING MEDICAL EDUCATION VIA TELE-DERMATOLOGY CONSULTS FOR RURAL PHYSICIANS

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There is reduced access to dermatology care in most rural and remote communities in British Columbia (designated by the Rural Subsidiary Agreement, Feb 2020) in the Master agreement currently in force. There is also a shared perception among some practitioners in continuing professional development (CPD) that the preferred form is delivered at the "point of care", along with the consult. Since our telemedicine service allows that opportunity, we wanted to survey the evidence for the "point of care" hypothesis being superior in any way: more likely to be read, tried, or become useful in daily practice. The comparison was with other forms of CPD such as didactic lectures, unsolicited handouts, or other more structured formats. We performed a MEDLINE Ovid search (All Years-Dec 29th, 2021) with the keywords "Telemedicine" AND "Education, Medical, Continuing" and manually reviewed abstracts as well as cross-referenced relevant cited articles for qualitative analysis. We were not able to find adequate evidence to support the working hypothesis that CPD at the "point of care" was in fact superior to other forms. Although there are studies that do show value in the method, they were not directly comparable enough to allow "evidence-based" conclusions. In fact, and to the best of our knowledge, none have been designed that way. Also, it is obvious that the effectiveness of any education is also related to its quality, something which is more difficult to control. We present our practical conclusions and ideas for "next steps". We hope for a lively discussion.

Category: Pilot/exploratory experiments

Poster 17

THE SKIN TONE HUE: A QUANTIFIABLE METRIC FOR DESCRIBING SKIN COLOUR

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Background and Hypothesis: Normal skin colour depends mainly on two factors: melanin and hemoglobin. Previous literature postulates that skin colour, though varying in lightness and saturation due to melanin content, are all one consistent hue, as melanin acts as a neutral density filter over the red hemoglobin of blood and does not alter the hue. This study explores the hypothesis that a common skin tone hue can be quantified.

Methods: The average hue of skin pixels was calculated from two datasets: a public dataset of ~50,000 skin pixels derived from internet images, under normal lighting conditions and without post-processing, and a set of 50 high resolution images taken under consistent lighting with manual white balancing from a dermatology clinic (~2.2×10^8 skin pixels). The pixels were converted into the hue-saturation-value (HSV) colour space and the average response in the hue channel was calculated, along with measures of standard deviation.

Results: The dataset of 50 images generated an average hue of 0.068±0.015, whereas the public dataset had an average hue of 0.059±0.048. As hue can be expressed in degrees, this corresponds to 24.6±5.2° and 21.3±17.4°, respectively. In terms of colour response, the skin tone hue approximates to light within the range of 600nm to 650nm.

Conclusions: Both datasets resulted in values within one standard deviation of each other, which supports the hypothesis that skin tone can be generalized as a tight range of hues. The skin tone hue can be used to validate other skin imaging tools, such as colour constancy algorithms.

Category: Pilot/exploratory experiment

Poster 18

INTEGRATING DERMATOLOGY SERVICES INTO A SOCIAL PEDIATRICS NETWORK: 8 YEARS OF EXPERIENCE IN THE RICHER (RESPONSIVE, INTERDISCIPLINARY/INTERSECTORAL, CHILD/COMMUNITY, HEALTH, EDUCATION, AND RESEARCH) PROGRAM

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Evidence is mounting that adverse childhood experiences (ACEs) and socioeconomic determinants have profound and lasting impacts on health.[1-3] It is estimated that 50% of health outcomes are impacted by socioeconomic factors, with much of this impact occurring during early childhood.[4] Social pediatrics is "an approach to child health that focuses on the child, in illness and in health, within the context of their society, environment, school, and family", while fostering protective factors to mitigate the impact of ACEs and care for the whole child with integration into community services.[5-9]

The RICHER program was created in 2006 in Vancouver, BC to connect with and support socially isolated and marginalized families living in poverty to provide health care, coordinate social services, and improve health outcomes. Pediatric dermatology was integrated as a service in 2012, and the program currently serves approximately 400 children.

We performed a descriptive, retrospective chart review of patients from the RICHER dermatology clinic from February 2012 to February 2020 to learn more about the patients who had been served by the clinic. This time period included 125 pediatric dermatology clinics with 338 total patient visits. Approval was obtained from the University of British Columbia Children's and Women's Ethics Board.

Our findings highlight critical lessons learned from working within a social pediatrics model. We hope to show that dermatology can play a unique role within a social pediatrics initiative, and can have long term positive impacts on health outcomes for at-risk youth.

Category: Early experiments with well defined objectives/hypotheses

Poster 19

ORAL TRANEXAMIC ACID TREATMENT LONGER THAN 6 MONTHS FOR MELASMA PATIENTS: A RETROSPECTIVE CASE SERIES

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Melasma is a common acquired disorder of primarily facial hyperpigmentation that predominantly affects those with skin phototypes III and IV. It may be exacerbated by sunlight, oral contraceptives, pregnancy, and genetic factors. Due to its appearance and recalcitrant nature, melasma can cause significant impairment to quality of life. Long-term treatment options remain limited as chronic use of standard depigmenting agents such as hydroquinone are associated with increased risk of exogenous ochronosis and other cutaneous adverse events. With mounting evidence implicating vascular abnormalities in melasma, oral tranexamic acid (TXA), an antifibrinolytic, has been explored and found to be an effective off-label treatment for melasma. Unfortunately, its use is often limited to three to six months duration due to a lack of long-term safety data regarding its thrombotic risk. Thus, patients must often cycle between therapies to mitigate these risks. However, gynecologic studies of women who took up to a total dose of 526.5g of oral TXA over 27 months or 19.5g/month for heavy menstrual bleeding reported no significant increase in thromboembolic events. As such, we hypothesize that long-term use of oral TXA for melasma is safe given that total doses used in this setting are much lower, around 42g for a typical regimen of 250mg twice daily, or 14g/month. A retrospective chart review will be performed of patients ≥18 who were treated with oral TXA for melasma for ≥ 6 months at a local dermatologic centre. Treatment response will be evaluated using the Modified Melasma Area and Severity Index (mMASI) score using de-identified photographs at baseline, 6 months, 1 year, and 2 years. Adverse events during treatment will be reported as documented. Incidence of and duration to relapse upon cessation of oral TXA will also be reported.

Category: Pilot (retrospective chart review)

Poster 20

IGA AUTOANTIBODIES TARGET PULMONARY SURFACTANT IN COVID-19 PATIENTS

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Introduction: Severe coronavirus disease 2019 (COVID-19) frequently induces autoimmunity with wide-ranging health implications. While the lung is the primarily affected organ of infection, local mechanisms involved in the development of autoimmunity remain largely unknown. In this study, we investigate the presence and effect of lung-specific autoantibodies induced by COVID-19.
Methods: We established a prospective clinical observational study with cohorts of mild and severe COVID-19 patients at three Swiss tertiary hospitals. To identify potential autoantibodies, we used protein pull-down columns, mass spectrometry, immunofluorescence staining and enzyme-linked immunosorbent assays (ELISA). Given that we have previously shown that total IgA are elevated in severe COVID-19 and that they are part of the primary mucosal immune defense, we focused on IgA.
Results: Gene set enrichment analysis of the alveoli of post-mortem COVID-19 lungs revealed an expression pattern similar to that of systemic lupus erythematosus (P=0.02), strongly hinting towards the presence of autoimmune processes. Immunofluorescence staining of these lungs displayed prominent IgA deposition that co-localized with surfactant proteins. Remarkably, no IgA deposition was found in non-COVID19-controls with other lung diseases. In sera of COVID-19 patients, pull-downs with poractant alfa showed immunoglobulins binding to surfactant proteins (SPs). Concurringly, ELISA coated with recombinant SPs detected anti-SP IgA only in blood of severe COVID-19 patients.
Conclusion: Our data suggest that IgA-driven autoimmunity against surfactant proteins contribute to disease progression of COVID-19. This can improve patient care by defining additional pathomechanisms as important contributors to disease progression.

Category: Early experiments with well-defined objectives/hypotheses

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