

8:40 a.m.

PSORIASIS INDUCED PIGMENTATION

Abdalaziz Almokhaizeem, Sunil Kalia, Tashmeeta Ahad, Jan Dutz

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Persistent pigmentation in psoriatic lesions following systemic treatment has been a recurrent observation documented in numerous case reports. Termed lentiginous hyperpigmentation, this post-inflammatory phenomenon has been associated with various therapeutic modalities. The precise mechanisms and associations underlying its occurrence remain elusive. Methods: This study constitutes a retrospective chart review encompassing all patients within our center diagnosed with psoriasis who exhibit post-inflammatory lentiginous hyperpigmentation in previously cleared skin lesions. Patients will be classified by Fitzpatrick group and ethnicity. Colometry, Confocal microscopy and Tape stripping will be done as part of pigment evaluation. As part of our comprehensive assessment, patients will be administered the Dermatology Life Quality Index (DLQI) questionnaire to gauge the impact of this pigmentation phenomenon on their quality of life. Conclusion: In this study, our primary objective is to deepen our understanding of lentiginous hyperpigmentation in psoriasis cases. We aim to elucidate the incidence and duration of this phenomenon, explore its distribution concerning ethnicity and Fitzpatrick skin phenotype, and assess its impact on the quality of life of affected individuals. By shedding light on these aspects, our research endeavors to provide valuable insights into the clinical implications of lentiginous hyperpigmentation, offering a foundation for more targeted therapeutic approaches and enhanced patient care.

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

8:52 a.m.

LONGITUDINAL NON-INVASIVE OPTICAL BIOPSY OF KERATINOCYTE CANCERS TO MONITOR EFFICACY AND RESPONSE TO TREATMENT

Shujian Li^{1,3}, Sunil Kalia^{1,2,4,5}, Harvey Lui^{1,2,3}, Zhenguo Wu^{1,3}, Haishan Zeng^{1,2,3}, Tim K. Lee^{1,2,5,6}, Jianhua Zhao^{1,3}, Tashmeeta Ahad^{1,2,4,5}

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The efficacy data of minimally invasive treatments for keratinocyte carcinomas is lacking as histological surveillance of treated skin is often impractical due to the need for multiple biopsies. We will adopt multimodal non-invasive optical methods to monitor the tumor cell dynamics after treatment. Patients with superficial keratinocyte carcinomas will be assessed at 3-month intervals up to 12-months following treatment.

Our preliminary results include 18 patients: 13 had basal cell carcinomas (BCCs) – 9 treated with curettage and electrodesiccation (C&D), 2 with surgical excision, 1 with photodynamic therapy, and 1 with 5% imiquimod. Additionally, 2 patients had squamous cell carcinomas (SCCs), treated with C&D and topical fluorouracil, respectively. 2 patients had actinic keratosis (AKs) and 1 patient had both AK and seborrheic keratosis (SKs); all three were treated with cryotherapy. With multimodal microscopy, integrating reflectance confocal microscopy (RCM), two-photo fluorescent (TPF) microscopy and second harmonic generation (SHG), we identified that tumor islands (aggregates of tumor cells) as specific feature for BCCs, and the button-hole structures (dilated blood vessels within the dermal papillae that run perpendicular to the skin surface) was specific for SCCs. Other key features include epidermal streaming (elongated keratinocytes arranged in a polarized directions), epidermal pleomorphism (varied keratinocytes cell shape and size at the same depth), and disrupted honeycomb pattern and collagen arrangement). Abnormal features disappeared post-treatment suggesting resolution of BCC/SCCs; this correlated with surgical biopsy results showing no residual malignancy (n=3). Excessive collagen deposition, suggesting ongoing dermal remodeling, was observed as a continuous process during the 12-month monitoring period.

Category: Applied/functional experiments

9:04 a.m.

ASSESSING THE ASSOCIATION BETWEEN SUNSCREEN USE AND SUNSCREEN ATTITUDES AND BEHAVIOURS: A CROSS SECTIONAL STUDY

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Optimal sunscreen use depends on application frequency and the amount applied. Few studies examined patients' sunscreen use by number of bottles used. We sought to identify demographic and behavioural factors associated with patients' annual sunscreen bottle usage.

We analyzed survey data collected during skin cancer assessments in Vancouver, Canada. Patients recorded their demographics, sunscreen attitudes and behaviours, and photoprotective practices. Patients were categorized by annual sunscreen use: three or more 100mL bottles or less than three. Odds ratios (ORs) assessing demographic and behavioural factors associated with using 3+ bottles of sunscreen annually were estimated using logistic regression.

We included 215 patients, 9 of whom used no sunscreen annually, 63 used one bottle, and 65 used two bottles. Patients using 3+ bottles (n=78) were motivated to wear sunscreen to prevent sunburn (85.9%), aging (75.6%), and skin cancer (98.7%). Many wore sunscreen on their face every day (71.8%), at the beach (91.0%), and outdoors on sunny days (94.9%). Skin irritation (35.9%) and absorption of chemicals (26.9%) would reduce patients' sunscreen use. Factors associated with higher amounts of sunscreen use were male gender (OR 3.2; 95% confidence interval (95%CI): 1.1-9.3), history of skin cancer (OR 4.3; 95%CI: 1.1-17.0), spending 3+ hours outdoors in the sun (OR 4.0; 95%CI: 1.1-14.0), and applying sunscreen to the trunk on sunny days (OR 6.4; 95%CI: 1.5-27.4).

Several demographic and behavioural factors were associated with increased sunscreen use annually. Future directions include establishing a patient cohort to longitudinally evaluate sunscreen use patterns in relation to skin cancer risk.

Category: Early experiments with well-defined objectives/hypotheses

9:16 a.m.

COMPARING REFLECTANCE SPECTROSCOPY DETECTION SYSTEMS AND MELANIN MEASUREMENTS IN HUMAN SKIN

Pourghadiri, A.¹, Ahad, T.², Zhao, J.^{2,3}, Lui, H.^{2,3}, Zeng, H.^{2,4}, Lee, T.^{2,6}, Kalia, S.^{2,3,5,7}

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Diffuse reflectance spectroscopy (DRS) is a noninvasive optical technique that measures melanin content in healthy skin, as well as in cases of ultraviolet exposure and pathologically pigmented conditions. In this study, we compared the optical characteristics of a custom-designed and clinically practical fibre probe (FP) model to a commercially available integrating sphere (IS).

Forty-five participants were included in this study, and reflectance measurements were assessed on 16 healthy anatomical regions. The mean spectra of FP were divided by IS and compared between 600-750 nm using a linear regression model. The ratio of FP and IS melanin content was computed and compared across sixteen anatomical regions using a one-way ANOVA.

The ratio of FP to IS reflectance fit a linear regression model, with r^2 values ranging 0.97-0.98 and root mean square error (RMSE) from 0.0047-0.011. The ratio of IS and FP melanin content was not significantly different across all anatomical regions ($p > 0.05$), and IS melanin was, on average, $28 \pm 1\%$ (mean \pm SEM) greater than FP.

Our results demonstrated that a clinically feasible FP model provides reliable optical measurements and permits the evaluation of anatomical regions that are inaccessible using commercially available methods.

Category: Applied/Functional Experiment

9:28 a.m.

PEDIATRIC DERMATOLOGY REFERRALS: HIGHLIGHTING THE NEED TO EDUCATE COMMUNITY HEALTHCARE PROVIDERS ON THE MANAGEMENT OF ATOPIC DERMATITIS

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Studies show a high prevalence of unnecessary referrals to pediatric dermatology for atopic dermatitis (AD), as most cases are manageable in primary care. We will soon launch the Pediatric AD Care Pathway, which outlines criteria for AD referral. We aimed to characterize the most common practices of community healthcare providers prior to referral to improve educational resources for non-dermatologists on AD management. We analyzed 962 referrals to the pediatric dermatology department at BC Children's Hospital within a 2-week period in May 2023, including 114 new referrals and 848 already awaiting appointment. Low urgency referrals were overrepresented (68.5%), as most new referrals were medium urgency (59.6%). Referrals primarily came from family physicians (63.9%). Most sources sent only one referral (73.7%), with only two sending more than 10 referrals. The most frequent referring diagnosis was AD in the whole sample and in new referrals. Within AD referrals, 41.4% did not meet criteria for referral. This was mostly due to a lack of information provided (50%), followed by lack of moderate-potency topical corticosteroid treatment mentioned (29.3%). To conclude, AD was the predominant referred condition, however many cases did not meet criteria for referral. There were 639 sources who sent referrals in the period studied, highlighting the need for wide dissemination of educational materials. At the same time, the majority of providers sent only one referral, therefore education on pediatric dermatological conditions may not be particularly relevant to their practice. Point of care resources may be more helpful than education in these cases.

Category: Early experiments with well-defined objectives/hypotheses

11: 00 a.m.

GRANZYME K INDUCES KERATINOCYTE PROLIFERATION AND IL-23: IMPLICATIONS FOR PSORIASIS PATHOGENESIS

Katlyn Richardson^{1,2,3}, Christopher Turner^{1,2,3}, Alexandre Aubert^{1,2,3}, Sho Hiroyasu^{1,2,3}, Richard Crawford², Rachel Cederberg², Angela Burleigh⁴, Megan Pawluk^{1,2,3}, Layla Nabai^{1,2,3}, Karen Jung^{1,2,3}, Hongyan Zhao^{1,2,3}, and David Granville^{1,2,3}.

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Psoriasis, characterized by excessive keratinocyte proliferation and inflammation, presents substantial therapeutic challenges. Our previous research demonstrated that serine protease Granzyme K (GzmK) is elevated in lesional psoriasis skin. Further, in a murine model of psoriasis, GzmK knockout (K-KO) mice exhibited reduced disease severity compared to wild-type (WT). GzmK was recently proposed as a key mediator of inflammation and cell proliferation, while mitogen-activated protein kinases (MAPK) and signal transducer and activator of transcription 3 (STAT3) signaling have also been linked to keratinocyte proliferation and inflammation in psoriasis. Thus, we hypothesized that GzmK mediates keratinocyte proliferation and inflammation as well as activates the MAPK and STAT3 signaling pathways in psoriasis. Upon treatment with GzmK in vitro, keratinocytes exhibited increased cell proliferation while macrophages increased mRNA and secreted protein levels of IL-23. Additionally, both cell types exposed to GzmK showed phosphorylation of p38 and p44/42 MAPK as well as STAT3. GzmK-mediated keratinocyte proliferation and MAPK/STAT3 signaling was nullified by a neutralizing antibody or siRNAs targeting pro-inflammatory protease-activated receptor-1 (PAR-1), suggesting that this GzmK-mediated phenotype is PAR-1 dependent. In agreement, skin tissues from K-KO mice displayed reduced proliferation and inflammation compared to WT. Collectively, GzmK-mediated keratinocyte proliferation and activation of MAPK/STAT3 signaling pathways are PAR-1 dependent, and GzmK induces IL-23 release from macrophages. Our studies suggest GzmK is a potential new therapeutic target for psoriasis management.

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

11:12 a.m.

TEN-YEAR DATA ON CANADIAN MEDICO-LEGAL TRENDS FOR LASER THERAPY FROM 2013 TO 2022

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Although medico-legal trends in cutaneous laser surgery have been explored in the United States, current understanding in Canada is limited. Characterizing the Canadian medico-legal landscape in laser therapy may identify factors that can compromise patient care.

Medico-legal data were extracted from the Canadian Medical Protective Association's (CMPA) national database for cases closed from 01/01/2013-12/31/2022 with a Canadian Classification of Health Interventions code for laser therapy and CMPA expansion code for light therapy. Cases included civil-legal actions, hospital complaints, and regulatory authority (College) complaints.

CMPA closed 120 cases involving laser therapy, of which 67 (55%) cases had unfavourable outcomes for physicians. Family physicians (36%), dermatologists (33%), and plastic surgeons (11%) were the most common physicians implicated. Laser therapy was administered by non-physician operators (NPOs) in 29 (24%) cases. The top procedural complications included burns (n=45), pigmentation abnormalities (n=28), and scarring (n=20). Among cases with burns, NPOs performed 20 (44%) cases, whereas physicians performed 14 (31%) cases. The most common allegations were related to injury associated with care (n=61), inadequate consent process (n=48), and deficient assessment (n=24). Expert-reviewed factors contributing to complaints included communication breakdown with patients (n=38), documentation issues (n=20), procedural violations (n=19).

Our study suggests that medico-legal risks stemmed primarily from laser-associated injuries and inadequate patient communication. Although CMPA data primarily encompasses cases with physician involvement, a higher proportion of burn complications were observed in laser procedures performed by NPOs. Training in obtaining patient consent emphasizing on procedural risks and additional provider supervision during laser treatments may improve patient safety.

Category: Early experiments with well-defined objectives/hypotheses

11:24 a.m.

FAST-SPEED TILTED-PLANE VOLUMETRIC IMAGING OF FRESHLY EXCISED HUMAN SKIN TISSUES

Zhenguo Wu^{1,2}, Tashmeeta Ahad¹, Sunil Kalia^{1,3,4}, Harvey Lui^{1,2}, Shujian Li², Jianhua Zhao^{1,2}, Haishan Zeng^{1,2*}

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Fast-speed volumetric imaging methods are desired for both multiphoton and confocal microscopy. A tilted-plane volumetric imaging and reconstruction method was developed to achieve fast volumetric imaging of freshly biopsied/excised human skin tissue based on simple xy laser scanning. A volume that covers a surface area of 10 mm × 8 mm and a thickness of 80 μm can be acquired in 9 minutes. The large surface area was achieved by stitching multiple volume strips each of which covers a width of 800 μm. A single-volume stripe was reconstructed from a sequence of frames acquired along the tissue surface at a frame rate of 198 frames per second. Each frame was acquired in an imaging plane that is tilted relative to the tissue surface. The high frame rate was achieved by a 4 kHz resonance scanner and a galvo scanner. The frame rate depends on the number of lines to be acquired in the depth direction. 198 frames per second were achieved with 38 lines. The imaging method was implemented on a multimodality microscopy imaging system to generate confocal reflectance, second harmonic, and two-photon fluorescence volumes simultaneously and give complementary information about the tissue. Shave biopsies of basal cell carcinomas were measured from the bottom surface to detect residual tumors. The method with further refinement could be used for fast assessment of the completeness of skin cancer surgery.

Category: Early experiments with well-defined objectives/hypotheses

11:36 a.m.

LONG-PULSED 532 NM LASER FOR TREATMENT OF DERMATOSIS PAPULOSA NIGRA AND SMALL SEBORRHEIC KERATOSES: EXPERIENCE WITH 71 PATIENTS

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Elective treatment of dermatosis papulosa nigra (DPN) and small seborrheic keratoses (SK) is commonly requested by patients as a cosmetic concern. For the available treatment modalities, the risk of post-treatment pigmentary alteration is considerable, particularly for patients with higher Fitzpatrick skin types. Currently, it remains unclear whether a specific treatment modality is superior, and the choice may therefore be guided by access to equipment within a given dermatology practice.

To report on the efficacy and safety of the long-pulsed 532 nm frequency-doubled Nd:YAG laser for the treatment of DPN and SK, including the rate of post-inflammatory hyperpigmentation (PIH), in a diverse patient population.

A single centre, retrospective chart review of patients treated for DPN and SK using the long-pulsed 532 nm laser was conducted. Two dermatologists examined pre-and post-treatment photographs and assigned a clinician rated improvement score, along with a qualitative assessment for PIH.

Overall, patients achieved an average clinician rated improvement score of $79 \pm 14\%$. Most skin lesions were located on the face alone (80%) or face and neck (16%). Mild to moderate PIH was seen in 7% of patients. Concomitant vascular lesions were treated in 32% of patients.

The versatile long-pulsed 532 nm laser appears to be an effective option for the treatment of DPNs and small SKs. With low rates of post-inflammatory dyspigmentation on the face and neck, it serves as a safe treatment option for patients with higher Fitzpatrick skin types and allows the option of treating concomitant vascular lesions.

Category: Applied/functional experiments

11:48 a.m.

ASSESSMENT AND DIFFERENTIATION OF SKIN DISEASES USING MULTISPECTRAL IMAGING

Thomas JX Zhang^{1,2,3}, Haishan Zeng^{1,2,3}, Tashmeeta Ahad^{1,2}, Tim K. Lee^{1,2,3}, Harvey Lui^{1,2,4}, Zhenguo Wu^{1,2}, Jianhua Zhao^{1,2}, Sunil Kalia^{1,2,3,5}

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Visual examination is crucial for skin disease diagnostic evaluation in dermatology. Non-invasive imaging techniques for skin assessment can extend the perception of human vision and can be beneficial tools for diagnosis, research, and monitoring disease progression.

We aim to investigate the utility of a multispectral imaging (MSI) technique to objectively quantify and differentiate skin diseases.

We designed an MSI system that captures a series of ten images, including a white light image and nine narrowband spectral images (420, 467, 540, 560, 580, 632, 660, 730 and 980 nm) which were uniquely filtered to target the distribution of various skin chromophores, such as the bilirubin, hemoglobin, melanin, and the water contents of the skin. These images will be analyzed using spectral and image processing techniques based on the pixel and wavelength properties of each image. Pixel-wise descriptions of disease morphological features will be made as classification prediction variables. These variables would be used to derivate a processing framework for identification and classification of benign and malignant skin diseases.

We anticipate that the MSI optical technique can be used to classify different skin diseases and to monitor disease progression with improved results over clinical and dermoscopy images. Our study can show the distinct biological and biophysical compositions of diseased skin compared to healthy skin based on the pixel-based findings that are correlated with morphologic traits and disease severity.

Category: Early experiments with well-defined objectives/hypotheses

12:45 p.m.

UPDATE OF SUNSCREEN FILTERS AND PHOTOPROTECTIVE CLOTHING

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Sunscreen and clothing are essential to protect the skin from harmful ultraviolet (UV) radiation and visible light. This study aims to update sunscreen filters and photoprotective clothing available in Canada, the US, and other regions, and their protection within the electromagnetic radiation spectrum.

Our research involved a systematic review that gathers information on existing sunscreen filters and photoprotective clothing. Emphasis was placed on filters approved or designed post-2019 and newly proposed clothing materials. The study documented the protective capacity of new filters across the electromagnetic spectrum and evaluated clothing using the ultraviolet protective factor (UPF). Adoption and approval status in different countries, particularly in Canada and the US, were also examined.

Our investigation identified five new sunscreen filters since 2019 and new distinct types of photoprotective clothing. Three filters await approval in Canada but are accessible in the European Union, and two filters were introduced in 2020. There is a lack of information on suitability for different skin tones for these new filters. Photoprotective clothing incorporates materials such as ECOVERO™ viscose fibers and carbon nanotubes. Some materials provide additional benefits, including a UPF exceeding 70, quick-drying properties, odor resistance, or eco-friendliness. Ongoing research explores the potential use of natural agents such as helichrysum in clothing to enhance UPF.

This study highlights advancements in sunscreen filters and clothing materials for UV and visible light protection. The review offers a timely update, encouraging continuous research to empower individuals, especially those with diverse skin tones, in making informed choices.

Category: Early experiments with well-defined objectives/hypotheses

12:57 p.m.

THE ILDS IMAGE GALLERY: A ROBUST, STRUCTURED AND FLEXIBLE DERMATOLOGY IMAGE DATABASE

Andy Zhao^{1,2,3}, Daniel C. Louie^{1,2,3,4}, Yuheng Wang^{1,2,3,4}, Umar Ali^{1,3,5}, Chloe Yue^{1,2,6}, Harvey Lui^{1,2,4}, Sunil Kalia^{1,2,4,7,8}, Tim K. Lee^{1,2,3,4}

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Deep learning is accelerating in prevalence in dermatology research. The performance of these AI models is largely contingent on extensive, accurate, and representative bodies of data. Unfortunately, a major limitation for AI development is access to ethically sourced and accurately tagged image datasets for training. A key component to this data is image metadata. Representative and standardized metadata, such as for the diagnosed lesion in the image, the size of the lesion, or the body site the image was taken of, is critical for AI training, since data bias has a large influence on the outputs of these models. As a solution, I’ve collaborated with the W.H.O. to create a proof-of-concept image database to source, tag, and manage dermatology images of all varieties for both educational and research purposes. This database makes use of the ICD-D linearization of the ICD-11 and the ICD-ST terms for body sites to standardize the inputs and categorization of images. This database is built on Node.JS and MySQL to provide a responsive client for the user and a resilient data solution on the backend for the metadata. In using the ICD-D and the ICD-ST, we can leverage their hierarchical and interrelated structure to better standardize disease names, view relationships between categories, and otherwise fully codify the images that we store, creating an exemplary image database for machine learning training. Moreover, these images have extended applications to education, where they can provide representative training examples for medical trainees in the future.

Category: Pilot/exploratory experiments

1:09 p.m.

SHEDDING LIGHT ON SKIN CANCER RISK FOLLOWING ULTRAVIOLET B PHOTOTHERAPY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Kaiyang Li¹, Sauliha Alli², Wei Guang Bi³, Richie Jeremian¹, Tashmeeta Ahad⁴, Harvey Lui⁴, Sunil Kalia^{4*}

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Ultraviolet B (UVB) phototherapy is an effective treatment for various dermatologic conditions; however, concerns exist about its potential oncogenic risk with prolonged exposure. We conducted a systematic review and meta-analysis to evaluate the risk of cutaneous malignancies and pre-malignancies associated with UVB phototherapy. Fifteen studies involving 132,093 participants were included, comprising ten retrospective cohort studies, four case series, and one prospective cohort study. The sample predominantly consisted of participants of FST I-IV who received treatments for psoriasis, vitiligo, atopic dermatitis, uremic pruritis, or lichen planus. The mean age was 46.4 years (SD 18.7); 64,133 patients (49%) were male and 66,580 patients were female (50%). The follow-up duration ranged from seven months to 28 years. Seven studies with comparison group data available to calculate effect sizes were included in the meta-analysis. Overall, compared to no UVB phototherapy, no association was found between UVB phototherapy and skin cancer (relative risk [RR] 0.99, 95% CI 0.75-1.32, p=0.96), melanoma (RR 0.76, 95% CI 0.41-1.43, p=0.40), or non-melanoma skin cancer (RR 1.00, 95% CI 0.69-1.43, p=0.98). No significant difference was found with either no treatment or psoralen ultraviolet A (PUVA) therapy as the comparison group. However, at a cut-off of 90-100 sessions of UVB phototherapy, higher exposure was associated with a greater risk of actinic keratosis (RR 1.65, 95% CI 1.13-2.40, p=0.009) and all skin pre-malignancies (RR 1.52, 95% CI 1.17-1.98, p=0.002). Our findings support the overall safety of UVB phototherapy for various skin conditions with caution advised for higher exposure levels. [247 words]

Category: Review [(2) Early experiments with well-defined objectives/hypotheses]

1:21 p.m.

DATA AUGMENTATION FOR RAMAN SPECTRAL ANALYSIS: APPLICATION FOR SKIN CANCER DISCRIMINATION

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With the development of deep neural networks, data augmentation has been widely used for image processing. The objective of this study is to propose and evaluate data augmentation strategies for Raman spectral analysis and its applications to skin cancer detection.

Different data augmentation strategies were proposed and evaluated, including added random noise, spectral shift, spectral combination and artificially synthesized spectra using one-dimensional generative adversarial networks (1D-GAN). Dataset used in this study contains Raman spectra of 731 skin lesions, including 340 cancerous and precancerous lesions (melanoma, basal cell carcinoma, squamous cell carcinoma and actinic keratosis) and 391 benign lesions (melanocytic nevus and seborrheic keratosis). The stratified samples were divided randomly into training (70%), validation (10%) and test dataset (20%); this random split scheme was repeated 56 times using parallel computing to prevent over-fitting and bias. One-dimensional convolutional neural networks (1D-CNN) and conventional machine learning approaches, including partial least squares for discriminant analysis (PLS-DA), principal component and linear discriminant analysis (PC-LDA), support vector machine (SVM), and logistic regression (LR) were all evaluated. The area under the receiver operating characteristic curve (ROC AUC) was used as a measure of the diagnostic performance.

Different augmentation strategies showed slightly different performances for convolutional neural networks and machine learning techniques. The ROC AUC of the *test dataset* were 0.886±0.022 (1D-CNN), 0.870±0.028 (PLS-DA), 0.875±0.033 (PC-LDA), 0.864±0.027 (SVM), and 0.525±0.045 (LR) based on the original spectra, which were improved by 2-4% to 0.909±0.021 (1D-CNN), 0.899±0.022 (PLS-DA), 0.895±0.022 (PC-LDA), 0.901±0.020 (SVM), and by 71% to 0.897±0.021 (LR) respectively, after data augmentation of the training dataset.

Conclusions: Data augmentation strategies appeared to be a valuable tool not only for deep neural networks but also for conventional machine learning techniques, which improved the performance of skin cancer detection by Raman spectroscopy.

Category: (3) Applied/functional experiments (animal models of disease and in vivo studies, etc.)

1:33 p.m.

LASER TEST SPOTS: A SCOPING REVIEW

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Laser test spots are commonly suggested for assessment of clinical response and adverse effects, but use by laser operators is not well-described.

To describe the use of laser test spots in the existing published literature regarding methodology (location, treatment parameters) and objective (clinical efficacy or safety).

This scoping review was conducted according to PRISMA-ScR guidelines and included indexed studies performing test spots in human subjects for dermatologic conditions with clinical reassessment at a subsequent visit.

Among 5261 identified publications, 103 studies with 959 test spots were selected for inclusion. Test spots conducted were mostly on lesional skin (89.3%) assessing both clinical response and adverse effects (76.9%). Most test spots used multiple laser parameters with a single wavelength (48.3%). Fluence was most frequently adjusted either alone (30.1%) or in combination with pulse duration or spot size. Other described test spots examined a single set of laser parameters, multiple wavelengths with various parameters, or were left unspecified. The mean interval to reassessment was 7.6 weeks while the median was 6 weeks.

Laser test spot methodology was diverse and performed for dual objectives of efficacy and safety. The authors have compiled clinical considerations to assist laser operators in deciding if performing a test spot may be beneficial to their patient. Further research is required to elucidate whether test spots have any outcome on resource utilization or patient outcomes.

Category: Applied/functional experiments