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Session 1 - Translational Research

S01.01

Quantitative Assessment of Biophysical Skin Properties in Vitiligo Using in vivo Multimodal Spectroscopy Reveals Significant Tissue Alterations Beyond Melanopenia

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Introduction: Focal loss of epidermal pigment (melanopenia) is the hallmark pathophysiological difference between vitiligo and normal skin. Morphologic variants of vitiligo are based qualitatively on the distribution of lesions and their clinical appearances. The objective of this study is to quantitatively assess vitiligo in terms of its biophysical optical changes using multimodal spectroscopy.

Methods, Results: Thirty-seven patients (17 male, 20 female) were recruited in this study with a mean age of 42 (range: 18-74) years, covering Fitzpatrick skin types I [4], II [9], III [13], IV [7] and V [4]. Lesions of vitiligo and their adjacent normal skin were measured by diffuse reflectance and Raman spectroscopy. Skin color was calculated from the diffuse reflectance spectrum in the CIE L*a*b* color space. Biophysical properties including melanin, oxy-hemoglobin and deoxy-hemoglobin and scattering were calculated using the empirical Kollias algorithm. Lesion versus normal skin properties were analyzed statistically using the two-tailed paired Wilcoxon test.

Vitiliginous skin exhibits significantly higher L* with lower a* and b* values than adjacent normal skin ($p<0.0001$), indicating that the affected skin appears relatively lighter, less yellow and less red. These color changes are related to the underlying biophysical alterations within the skin. Vitiligo lesions exhibit much lower melanin ($p<0.0001$), deoxy-hemoglobin ($p=0.0014$) and scattering ($p<0.0001$), but higher oxy-hemoglobin ($p<0.0001$) and oxygen saturation ($p<0.0001$). Biochemical changes in vitiligo were also confirmed from Raman spectroscopy which revealed that vitiligo lesions appeared to have relatively higher keratin, collagen and hemoglobin signals, but much less melanin, carotene and nucleic acid signals.

Conclusion: Multimodal spectroscopy reveals that the biophysical difference between vitiligo and normal skin is beyond just a reduction in melanin content. Excessive oxy-hemoglobin and keratin signals may indicate localized inflammation; whereas excessive collagen and reduced carotene and nucleic acid signals may possibly indicate photodamage as a consequence of reduced melanin protection within vitiligo lesions.

Learning Objectives:

- Understand the spectroscopic techniques to quantify skin biophysical properties
- Understand the appearance of vitiligo and its underlying pathophysiological changes

S01.02

Cellular and Immune Landscapes of Vitiligo: Insights from Genomic and Transcriptomic Analyses

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Introduction: Vitiligo is a complex autoimmune disorder characterized by significant clinical heterogeneity. While some patients develop lesions on the typical areas prone to friction or mechanical stress, certain group of patients show very rapid progression of lesions to whole body. The cellular and molecular process underlying these clinically heterogeneous group remain unknown.

Methods, Results: We investigated cellular and immune profiles of two endotypes: active progressive vitiligo (APV) and Koebner dominant vitiligo (KDV). Using single-cell RNA sequencing, we compared cell type differentially expressed genes (DEGs) of PBMC, perilesional, and nonlesional skin between APV, KDV, and healthy control. Systemic and tissue immune profiles showed distinct DEG expression between APV and KDV. APV represented an active, T-cell-centered inflammatory profile. Notably, B cells were increased with IFI30, CTSB, CTSS, MYD88, and CCR6, suggesting antigen-processing and inflammatory B-cell activation. CD8 T cells showed GBP1, FCGR3A,

CD244, CRTAM, and IL17RA, consistent with effector/cytotoxic activation and Tregs were showing plasticity into Th1-like Tregs. In nonlesional skin, APV keratinocytes were enriched with interferon-related markers and T-cells were presenting higher level of MHC molecules. Melanocytes in nonlesional skin were expressing higher dedifferentiation markers compared to KDV skin. In contrast, KDV showed a more myeloid-centered, stress-adpated state. NK/NKT cells were enriched for TRDV2, TRGV9, HLA-DQA1, HLA-DMA, LILRB1, and CCL4L2, suggesting a γδT-skewed or innate-like activated state. Across CD4 T, CD8 T, and TNK/Treg populations, KDV repeatedly showed negative-feedback/stress-adaptation genes such as NFKBIA, ZFP36, RBM38, DDIT4.

Conclusion: These two endotypes, APV and KDV seem to follow distinct immunological trajectories. APV showed a more active inflammatory signature with enriched JAK/STAT signaling pathways, whereas KDV preferentially were forming a self-sustaining chronic niche. Although these findings need to be validated in further studies, these different transcriptomic signatures provide a framework for endotype-specific precision therapies in vitiligo.

Learning Objectives:

1. Distinguish the immunological profiles of two endotypes: active progressive vitiligo (APV) and Koebner dominant vitiligo (KDV).
2. Interpret cell-type-specific transcriptomic signatures in vitiligo skin microenvironments
3. Apply endotype-specific molecular insights to precision therapeutic strategies

S01.03

Metabolic Reprogramming of Keratinocytes as a Driver of Therapy Resistance in Acral Vitiligo

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Introduction: Vitiligo is a chronic autoimmune skin disorder characterized by the loss of melanocytes. While non-acral vitiligo often responds well to conventional therapies, acral vitiligo—affecting the distal extremities—is notoriously resistant to treatment and prone to rapid re-depigmentation. The molecular mechanisms underlying this regional disparity in therapeutic response remain poorly understood.

Methods, Results: To investigate the site-specific microenvironmental factors, we employed NanoString GeoMx® Digital Spatial Profiling (DSP) on 12 skin samples (lesional and peri-lesional) from patients with acral and non-acral vitiligo. We segmented the skin into three distinct histological compartments: the non-basal keratinocyte layer, the basal layer, and the dermis, to perform high-resolution spatial transcriptomic analysis. While both acral and non-acral lesions showed a significant loss of melanocyte-specific markers (e.g., TYR, TYRP1, PMEL) and persistent "sillage" of inflammatory signaling (IFN-α and IFN-γ) even in stable disease, their metabolic profiles were diametrically opposed. In non-acral vitiligo, metabolism-related pathways (oxidative phosphorylation, glycolysis, and adipogenesis) were significantly downregulated in the epidermis. Conversely, acral vitiligo lesions exhibited a significant upregulation of these metabolic pathways, particularly within the non-basal keratinocyte layer. This dramatic metabolic reprogramming in acral keratinocytes suggests a unique response to vitiligo-related inflammation that may impair melanocyte survival and migration.

Conclusion: Our findings demonstrate that acral vitiligo is characterized by a distinct metabolic shift in the epidermal microenvironment. The increased metabolic activity of keratinocytes, driven by residual inflammatory stimuli, likely contributes to the clinical resistance and transient repigmentation observed in acral sites. These results suggest that targeting metabolic pathways, such as through a combination of anti-inflammatory and anti-OXPHOS (oxidative phosphorylation) therapies, may provide a novel strategy to overcome treatment resistance in acral vitiligo.

Learning Objectives:

1. Understand the differences between acral and truncal vitiligo, specifically focusing on why acral lesions exhibit higher treatment resistance and transient repigmentation.

2. Explain how spatial transcriptomics reveals a unique metabolic shift—characterized by increased oxidative phosphorylation and glycolysis—within the keratinocytes of acral vitiligo lesions compared to non-acral lesions.
3. Evaluate the potential of targeting the metabolic microenvironment, such as combining anti-inflammatory and anti-OXPHOS therapies, as a strategy to overcome conventional treatment resistance in acral vitiligo.

S01.04

Decoding Vitiligo Through Sebum: a Possible Novel Platform for Disease Monitoring

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Introduction: Patients with vitiligo exhibit systemic and skin metabolic dysregulation, including impaired glucose uptake and insulin resistance, which may promote a pro-inflammatory state. Emerging evidence suggests that sebaceous glands (SGs) actively modulate the dermal microenvironment under inflammatory conditions. Our previous studies demonstrate that SGs secrete growth factors and inflammatory cytokines in response to external insults, thereby regulating melanocyte activity. Importantly, SG responses to local inflammation are reflected in sebum, a non-invasive, information-rich biological matrix containing cytokines, growth factors, and bioactive lipids. This alllows real-time and spatially resolved monitoring of skin inflammatory and metabolic processes. SGs may therefore play an underrecognized role in melanocyte regulation through immunometabolic mechanisms. In this study, we investigate SG-melanocyte interactions and propose sebum as a promising tool for non-invasive, spatially resolved monitoring in vitiligo.

Methods, Results: We used in vitro and ex vivo models to assess the effects of IFN-γ, TNF, and IL-17 on sebocyte function and glucose metabolism. Results show that inflammatory cytokines reprogram sebocytes, reshape the secretome, and disrupt sebocyte-melanocyte crosstalk, leading to alterations in melanocyte metabolism, oxidative stress, and survival. In parallel, targeted and untargeted sebum protein profiling demonstrated that key cytokines such as CXCL10 correlate with disease status, suggesting a mechanistic link between inflammation, disease activity, and treatment heterogeneity.

Conclusion: Sebum provides a promising non-invasive biomarker platform for monitoring vitiligo activity and therapeutic response. This study identifies immunometabolic mechanisms linking sebaceous gland dysfunction to melanocyte pathology and highlights potential pathways underlying treatment responses, supporting precision medicine strategies in vitiligo.

Learning Objectives:

1. Understand the immunometabolic role of sebaceous glands in vitiligo pathogenesis.
2. Identify sebum-based cytokine biomarkers associated with disease activity and inflammation.
3. Explain how inflammatory cytokines drive sebocyte-melanocyte crosstalk and functional impairment.

S01.05

Towards Understanding Tissue Factors that Determine Heterogenous Vitiligo Response to JAK Inhibitor Treatment

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Introduction: Vitiligo is a chronic, often relapsing autoimmune skin condition characterized by white, depigmented patches that causes significant psychosocial distress for patients. Previous studies identified the IFNγ/CXCL9/10 axis to play a key role in driving CD8+ T cell activation, leading to the recent FDA-approval of ruxolitinib, a topical inhibitor targeting the JAK-STAT pathway. Topical JAK inhibitors (JAKi) prevent T cell recruitment to the epidermis and promote melanocyte repopulation. Unfortunately, even with long term topical JAKi use, lesions persist and repigmentation is often patchy or incomplete. Our previous work demonstrated that

keratinocytes exhibit abnormal signaling and metabolic disruptions in vitiligo patients. We hypothesize that keratinocyte-melanocyte interactions are disrupted in treatment resistant vitiligo lesions.

Methods, Results: We used spatial transcriptomics (10x Xenium) to analyze 8 partially responsive vitiligo patient samples to topical JAKi and nbUVB treatment. Each patient provided nonlesional, treatment-responsive (repigmenting), and treatment-unresponsive (non-repigmenting) skin and was analyzed using Seurat, CellChat and Squidpy. We also utilized Fontana-Masson staining and Transmission electron microscopy to assess melanin production.

Partially treated vitiligo skin often have melanocytes present but exhibit altered changes in keratinocyte-melanocyte signaling pathways such as PARs and KIT. Additional staining and transmission electron microscopy demonstrate that melanocytes are less active in treatment resistant vitiligo skin. Different keratinocyte populations are also more likely to persist in tissues that do not contain melanocytes.

Conclusion: Our findings suggest that in the face of JAK inhibition, altered melanocyte-keratinocyte interactions contribute to treatment resistance and melanocyte repopulation. Targeting melanocyte-keratinocyte interactions may further improve treatment response. We plan on further testing these pathways using in vivo mouse models alongside in vitro models of disease.

Learning Objectives:

- Describe how melanocyte presence and activity differ in partially responsive versus treatment resistant vitiligo lesions
- Understand how differences in melanocyte-keratinocyte interactions can contribute to treatment resistance in vitiligo
- Interpret how targeting melanocyte-keratinocyte interactions may improve therapeutic response in patients undergoing JAK inhibitor treatment

S01.06

Upadacitinib Suppresses Inflammatory Pathways and Enhances Melanocyte-Associated Biomarker c-Kit in Non-Segmental Vitiligo: Phase 3 Biomarker Analysis

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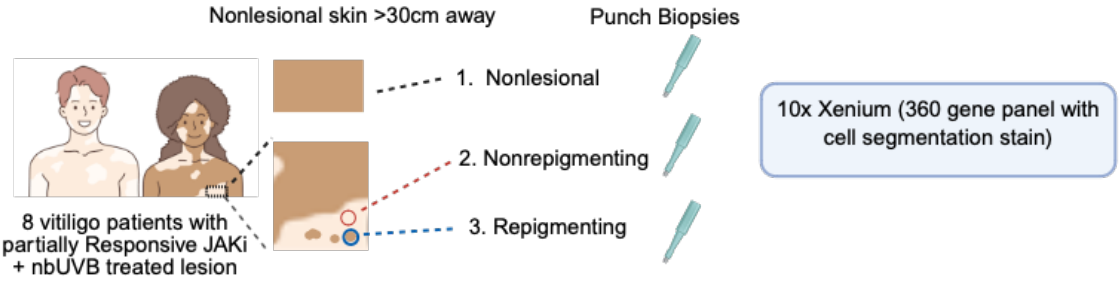
Introduction: Upadacitinib (oral, once-daily, reversible JAK inhibitor) was evaluated for treating non-segmental vitiligo (NSV) in two replicate phase 3 studies (Viti-Up; NCT06118411). In both studies, greater proportions of patients receiving upadacitinib 15 mg vs placebo achieved the co-primary endpoints of T-VASI 50 and F-VASI 75 at week 48. As reductions in inflammation may facilitate restoration of melanocyte function and subsequent repigmentation, we evaluated changes in serum biomarkers associated with inflammatory activity (CXCL10) and melanocyte pathways (c-Kit) and their correlation to clinical efficacy.

Methods, Results: Optional serum samples were collected during the 48-week placebo-controlled period. Disease relevant biomarkers, CXCL10 and c-Kit, were analyzed using ELISA. Additional soluble inflammatory protein mediators were analyzed using an Olink panel to assess modulation of pathways implicated in melanocyte destruction.

At baseline, patients exhibited elevated serum CXCL10 levels and reduced c-Kit levels vs healthy controls, with no significant differences between those with active or stable disease (**Figure 1A-B**). Treatment with upadacitinib resulted in rapid and sustained reductions in CXCL10 and increases in c-Kit, while placebo showed minimal changes (**Figure 1C-D**). At baseline, CXCL10 levels did not correlate with T-VASI (R=0.096; P=0.06). By week 48, the correlation increased minimally (R=0.13; P=0.028), remaining weak overall. In contrast, c-Kit levels demonstrated mild negative correlations with T-VASI at baseline (R=-0.23; P<0.0001) and at week 48 (R=-0.25; P<0.001). Moreover, upadacitinib inhibited multiple inflammatory pathways (NK cells and cytotoxic T-cells) implicated in immune-mediated melanocyte destruction.



Conclusion: CXCL10 and c-Kit were dysregulated in vitiligo regardless of disease activity. Upadacitinib normalized CXCL10 and increased c-Kit toward healthy levels, demonstrating effects on inflammatory and melanocyte pathways. Circulating melanocyte-associated biomarkers such as c-Kit may quantitatively reflect skin pigmentation, though c-Kit is also expressed by other cell types (eg, hematopoietic cells). Collectively, findings suggest that upadacitinib improves vitiligo by mediating systemic inflammatory and melanocyte-related pathways associated with disease pathology.

Learning Objectives:

- Characterize the dysregulation of disease-relevant serum proteins by comparing patients with non-segmental vitiligo to healthy controls
- Elucidate the biological pathways and mechanistic underpinnings of upadacitinib's clinical efficacy in patients with non-segmental vitiligo
- Evaluate the association between inflammatory and melanocyte-associated biomarker levels and skin repigmentation (Vitiligo Area Scoring Index [VASI])

S01.07

Enhancing Visualization of Vitiligo Lesions in Clinical Images Using Yellow Channel Suppression

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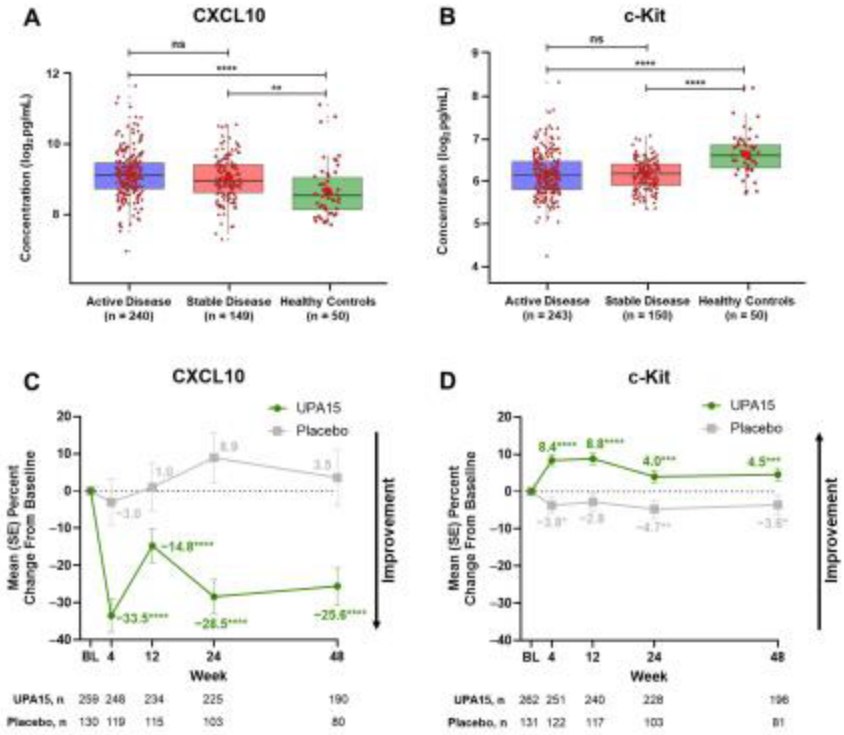
Introduction: Clinical photographs are widely used in dermatology for vitiligo assessment and longitudinal monitoring. However, the contrast between depigmented lesions and surrounding skin can sometimes be subtle, which limits visual interpretability especially in patients with lighter skin. This study investigates whether leveraging differences in yellow chromatic content between vitiligo lesions and normal skin can improve lesion visualization.

Methods, Results: A dataset of 80 clinical vitiligo images was processed under four conditions: original RGB, grayscale, grayscale with yellow channel suppression, and yellow suppressed grayscale with increased lightness. This approach is based on the observation that normally pigmented skin exhibits higher yellow chromatic content than vitiligo lesions, and that reducing this component may enhance contrast between the two. Six participants consisting of three dermatologists and three non-medical trainees independently rated image diagnostic quality as high, medium, or low. Images were presented in randomized order across two sessions with 50 image sets each and 20% overlap to assess intra-rater reliability.

The proportion of high quality ratings increased from 44.5% for original RGB images to 67.5% for images with yellow suppression. This improvement was statistically significant, with a 95% confidence interval indicating an increase between 17.5% and 28.5%. Rating patterns were consistent across sessions, with dermatologists demonstrating slightly higher intra-rater agreement. These findings suggest that suppressing yellow chromatic components enhances lesion-to-skin contrast and improves visual delineation of vitiligo boundaries.

Figure 1. Serum CXCL10 and c-Kit Dysregulation at Baseline and Longitudinal Modulation With UPA in Patients With NSV



ANOVA, analysis of variance; BL, baseline; ns, not significant; NSV, non-segmental vitiligo; UPA15, upadacitinib 15 mg.

Patients were classified as having actively progressing vitiligo at baseline if they had one of the following: new lesions or the progression (enlargement) of existing lesions within 6 months before baseline, or the presence of at least 1 lesion of confetti-like depigmentation, trichrome pattern, and/or Koebner phenomenon type 2B.

*P<0.05; **P<0.01; ***P<0.001; ****P<0.0001 vs baseline (based on one-way ANOVA).

Conclusion: Targeted suppression of yellow chromatic components is associated with improved perceived diagnostic quality of clinical images. This simple and reproducible approach supports clearer visualization of lesion boundaries without requiring specialized lighting conditions or additional equipment such as a Wood's lamp. It may therefore contribute to more consistent and efficient clinical assessment. Further evaluation using larger and more diverse datasets is warranted.

Learning Objectives:

1. Describe how yellow chromatic content affects contrast in dermatological images.
2. Evaluate the impact of yellow suppression on perceived diagnostic quality in vitiligo.
3. Identify practical techniques for improving visualization in clinical imaging workflows.

S01.08

hiJAcK Vitiligo: JAK3 and TEC-family Kinase Inhibition in the Pathogenesis and Treatment of Vitiligo

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Introduction: Broad JAK-inhibitors are effective, yet a relapse often follows treatment cessation, likely due to persisting tissue-resident memory T-cells, that depend on IL-15 signaling through JAK3. Due to their involvement in cytokine signaling, JAK3/TEC-family kinases likely play a role in vitiligo pathogenesis. Using ritlecitinib, a selective and irreversible JAK3/TEC-family kinase inhibitor, this study investigates JAK3/TEC kinases in vitiligo pathogenesis and evaluates whether selective inhibition with ritlecitinib can provide a more durable treatment.

Methods, Results: RNA-expression of JAK3/TEC-family kinases was compared between healthy skin and vitiligo skin using two scRNAseq datasets. Protein expression of these kinases in specific immune and non-immune cells was analyzed using multiplex immunohistochemistry. The effect of ritlecitinib was investigated using *in vitro* co-cultures of melanocytes and melanocyte-specific T-cells, analyzing both T-cell activation and melanocyte apoptosis by flow cytometry and live-cell imaging. The cellular effects of ritlecitinib were also investigated in *ex vivo* human-vitiligo skin-explant assays.

High levels of JAK3/TEC-family kinase-expressing cells were found in lesional vitiligo skin, compared to healthy skin, on both an RNA and a protein level. JAK3/TEC-kinases were predominantly expressed by immune cells such as T-cells and macrophages. Interestingly, keratinocytes more frequently expressed JAK3/TEC-kinases in vitiligo skin than healthy skin. Ritlecitinib effectively and durable reduced cytotoxic activity of T-cells against melanocytes in co-cultures. A decrease in melanocyte apoptosis was also observed after ritlecitinib treatment. Similar effects of ritlecitinib were seen in pilot skin-explant assays.

Conclusion: The increased presence of JAK3/TEC kinase-expressing cells in vitiligo underscores their role in vitiligo pathogenesis. *In vitro* and *ex vivo* analyses further clarify how targeting these kinases may enable effective and durable repigmentation therapy, by affecting both immune cells and skin cells like keratinocytes.

Learning Objectives:

1. Interpret the role of JAK3/TEC-family kinases in vitiligo pathogenesis based on RNA and protein expression data.
2. Recognize how selective inhibition of JAK3/TEC-family kinases could modulate immune-mediated melanocyte destruction.
3. Appreciate the potential of JAK3/TEC-family kinase targeting as a pathway to more sustained therapeutic effects in vitiligo treatment.

Session 3 - Medical Treatment

S03.02

Identifying Unmet Needs in Patients with Non-Segmental Vitiligo - a Survey Study in Egypt, South-Korea and the Netherlands

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Introduction: Patients with vitiligo face various challenges in treatment, management and care, often described as unmet needs. Systematic research identifying these needs is limited. This study aimed to determine the most common unmet needs experienced by patients with non-segmental vitiligo in current clinical care.

Methods, Results: This international, cross-sectional survey was conducted in four expertise centers in the Netherlands, Egypt and South Korea. Patients completed a questionnaire on unmet-need statements, each scored on a 5-point Likert scale. The survey contained 13 statements about unmet needs, categorized into three categories: 1. management and general care, 2. treatment, and 3. location. An unmet need was defined when ≥25% of patients agreed or strongly agreed; ≥50% indicated a high unmet need.

A total of 321 patients completed the survey and were included in the analysis. Concerns about "flare-ups" was the most frequently reported unmet need (65.8%) and was consistently ranked highest across all three countries, followed by "speed of repigmentation" (49.3%) and "long-term results" (47.8%). Unmet needs were largely similar across countries, gender and age groups.

Conclusion: All unmet needs identified were treatment related or body location specific. The findings emphasize the need for strategies that focus not only on repigmentation, but also address flare-ups, speed of repigmentation and durability. Future research should address these unmet needs, to eventually improve the quality of life for individuals with vitiligo.

Learning Objectives:

1. Recognize the key unmet needs reported by patients with non-segmental vitiligo, including flare-ups, speed of repigmentation, and long-term outcomes.

2. Incorporate patient-reported unmet needs into clinical decision-making to improve patient-centered vitiligo care.

S03.03

Efficacy of Upadacitinib in Adults and Adolescents for Treatment of Nonsegmental Vitiligo in Six Body Regions Across 48 Weeks of Treatment from Two Phase 3 Studies (Viti-Up)

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Introduction: Nonsegmental vitiligo (NSV) is an autoimmune inflammatory disease that results in depigmentation of the skin due to a loss of melanocytes. Vitiligo can affect any body area and commonly involves the face and distal extremities. Involvement of face, hands, and genitals is associated with a higher psychosocial burden. It is important that vitiligo therapies address repigmentation of all affected body regions. Upadacitinib (UPA), a selective once-daily Janus kinase inhibitor, has demonstrated efficacy for the treatment of NSV across 48 weeks in two identical phase 3 studies (Viti-Up) with no new safety signals reported.

Methods, Results: The current post hoc analysis assessed the responses of patients with NSV to UPA 15 mg (UPA15) vs placebo across six anatomical regions (head/neck, upper extremities [excluding hands], hands, trunk/genitalia, lower extremities [excluding feet], and feet) based on achievement of at least 50% reduction in regional Vitiligo Area Scoring Index (VASI 50) from baseline in the Viti-Up studies. Analyses were mutually exclusive to each region and were conducted using non-responder imputation; only patients with non-zero baseline regional VASI were included. At week 48, numerically (nominal $P \leq 0.001$) greater proportions of patients receiving UPA15 vs placebo achieved VASI 50 in the head/neck (43.3% vs 13.9%), upper extremities (27.6% vs 7.5%), hands (24.6% vs 7.3%), trunk/genitalia (23.5% vs 8.6%), lower extremities (22.4% vs 9.1%), and feet (12.7% vs 3.9%; Table 1). Treatment with UPA15 resulted in greater repigmentation vs placebo across all anatomic regions based on measures of VASI, with the greatest rate of VASI 50 clinical response seen in the head/neck region.

Conclusion: The results of the current post-hoc analysis indicate UPA provides notable repigmentation for adults and adolescents with NSV in all body regions, including those areas that are most commonly involved, socially critical, and/or therapeutically challenging, such as the face, hands, and feet.

Table 1. Proportion of patients achieving VASI 50 in each body region at week 48 (ITT_A; NRI)

% (95% CI), n/N	Placebo	UPA15	P value
Head and neck	13.9 (9.1, 18.7) 28/201	43.3 (38.5, 48.1) 178/411	<0.001***
Upper extremities (excluding hands)	7.5 (3.8, 11.2) 15/200	27.6 (23.2, 32.0) 111/402	<0.001***
Hands	7.3 (3.6, 11.0) 14/192	24.6 (20.4, 28.9) 98/398	<0.001***
Trunk/genitalia	8.6 (4.7, 12.5) 17/198	23.5 (19.3, 27.7) 94/400	<0.001***

Lower extremities (excluding feet)	9.1 (5.1, 13.1) 18/198	22.4 (18.3, 26.5) 88/393	<0.001***
Feet	3.9 (1.1, 6.7) 7/181	12.7 (9.3, 16.1) 46/363	<0.001***

ITT_A, intent-to-treat population period A; NRI, non-responder imputation; UPA15, upadacitinib 15 mg. ***P ≤ 0.001. Analysis includes only patients with non-zero baseline regional VASI; all p-values are nominal.

Learning Objectives:

- Results of the current study demonstrate that treatment with upadacitinib (15 mg) provides repigmentation of the skin for patients with nonsegmental vitiligo across body regions.
- Greater repigmentation with upadacitinib vs placebo was observed in socially critical and/or therapeutically challenging areas such as the face, hands, and feet.

S03.04

Circulating Central Memory T Cells in Localized Non-Segmental Vitiligo with Special Emphasis on the Additive Value Early of Systemic Treatment

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Introduction: Vitiligo has been recently reputed as a skin memory disease. Circulating memory T cells (TCMs) were found in vitiligo patients and were proposed to play role in disease memory and as a potential therapeutic target.

This study aimed at assessing the level of circulating TCMs in early localized vitiligo cases, prior to and after treatment and whether those cells are affected by adding systemic treatment to the therapeutic protocol.

Methods, Results: Forty-two patients along with thirty healthy controls were recruited and evaluated at baseline for circulating TCMs by multiparametric flow cytometry on peripheral blood samples. Twenty-two patients were followed up and were randomized to a 6-month topical treatment course versus combined topical and oral mini-pulse steroid therapy, by the end of which TCMs were re-evaluated.

At baseline, TCM levels were lower but not significantly different than controls. However, by the end of treatment course, levels were significantly lower than controls.

Significantly lower TCM levels were noted in patients who received topical treatment in comparison to controls, while difference was not significant in those who received combined topical and systemic treatment.

Limitations: Lack of assessment of tissue levels of resident memory T cells as well as the lack of quantifying the antigen specific TCMs.

Conclusion: Circulating TCM cells appear to be similar to controls in early localized vitiligo. Use of topical monotherapy is associated with their possible recruitment to the skin. The addition of systemic treatment was shown to lower their consumption.

Learning Objectives:

- Vitiligo, as a skin memory disease, has been quite challenging to prevent its recurrence. Further understanding of the role of different memory cells including the circulating memory T cells, would help understand how disease memory is developed and the chances of preventing its development.
- Recent onset localized vitiligo was viewed as an emergency, with view of preventing memory development with early aggressive treatment. However, how treatment can influence the circulating memory cells and their possible recruitment into the skin is an area that needs further research, which was addressed in this work.

S03.05

Post-Stability Maintenance Strategies and Recurrence Risk in Nonsegmental Vitiligo: a Multicenter Real-World Cohort Study

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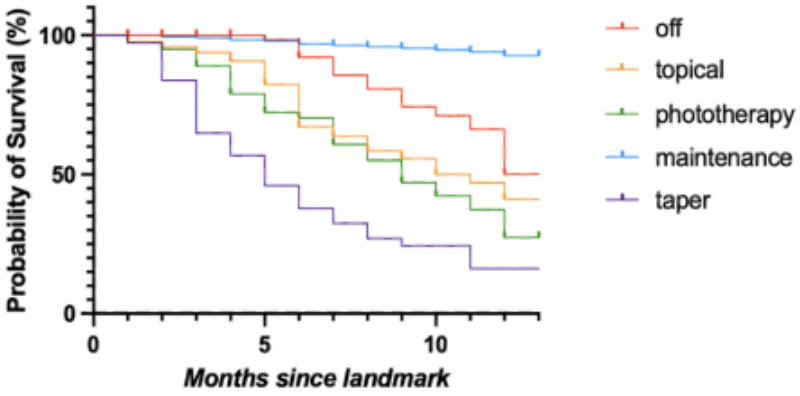
Introduction: Recurrence following clinical stability remains a major challenge in the management of non-segmental vitiligo. Despite achieving disease stabilization after induction therapy, a substantial proportion of patients experience relapse, highlighting the need for effective post-stability maintenance strategies. However, real-world comparative evidence guiding the choice of maintenance therapy is limited. This study aimed to evaluate recurrence risk across different maintenance approaches following clinical stability in patients with nonsegmental vitiligo.

Methods, Results: We conducted a multicenter retrospective cohort study using the Chang Gung Research Database (2015–2024). Patients with nonsegmental vitiligo who achieved ≥6 months of clinical stability after induction therapy were included. Post-stability management was categorized as off-treatment, topical therapy alone, phototherapy-based maintenance, systemic maintenance therapy, or systemic tapering. Recurrence risk was analyzed using extended Cox proportional hazards models with treatment as a time-varying exposure, adjusted for clinical and autoimmune covariates. Among 771 patients, 244 recurrences occurred during follow-up. Compared with systemic maintenance therapy, recurrence risk was significantly higher in patients who discontinued treatment (adjusted hazard ratio [aHR] 8.55; 95% CI 5.20–14.56), received topical therapy alone (aHR 11.69; 95% CI 7.13–19.88), phototherapy-based maintenance (aHR 15.65; 95% CI 9.77–26.20), or underwent systemic tapering (aHR 26.37; 95% CI 15.46–46.16) (all P < .001). Acral involvement and concomitant autoimmune disease were independently associated with increased recurrence risk.

Figure 1



Strategy	Median RFS (mo)	0 (mo)	3 (mo)	6 (mo)	9 (mo)	12 (mo)
Off-treatment	14	85 (0)	46 (5)	21 (10)	9 (12)	4 (14)
Topical	10	122 (0)	39 (4)	8 (6)	4 (7)	2 (9)
Phototherapy	9	165 (0)	40 (6)	6 (12)	1 (13)	1 (15)
Taper	5	37 (0)	9 (2)	3 (4)	1 (5)	1 (6)
Maintanence	NR	362 (0)	158 (20)	68 (34)	35 (45)	25 (50)

Conclusion: Systemic maintenance therapy after clinical stabilization was associated with substantially longer recurrence-free survival compared with non-systemic strategies or treatment discontinuation.

Learning Objectives:

1. To compare recurrence risk across different post-stability maintenance strategies in nonsegmental vitiligo using real-world data.
2. To evaluate the impact of systemic maintenance therapy versus non-systemic approaches on recurrence-free survival after clinical stabilization.
3. To identify clinical predictors of recurrence, including acral involvement and associated autoimmune disease, to inform long-term management decisions.

S03.06

Association Between Repigmentation Response and Geographic Latitude Among Patients With Vitiligo

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Introduction: Ruxolitinib cream demonstrated superior repigmentation vs vehicle at Week 24, with continued improvement through Week 104 in the TRuE-V studies. This post hoc analysis evaluated whether sunlight exposure affects repigmentation, using geographic latitude as a proxy.

Methods, Results: TRuE-V1/TRuE-V2 (NCT04052425/NCT04057573) enrolled patients ≥12 years old with nonsegmental vitiligo affecting ≤10% total body surface area. Patients were randomized 2:1 to twice-daily 1.5% ruxolitinib cream or vehicle for 24 weeks; all applied open-label ruxolitinib cream from Week 24 through Week 52. We assessed the percentage of patients at latitudes <35°, 35–45°, and >45° North achieving ≥50% improvement in total Vitiligo Area Scoring Index (T-VASI50), body region VASI50, ≥75/90% improvement in facial VASI (F-VASI75/90), and Vitiligo Noticeability Scale (VNS) 4/5 (a lot less/no longer noticeable). Data are reported as observed.

F-VASI75 rates with ruxolitinib cream were similar between latitudes at Week 24 (<35°, 35.7% [41/115]; 35–45°, 30.1% [46/153]; >45°, 27.8% [35/126]), but numerically higher at Week 52 for latitudes <35° (54.5% [55/101]) and 35–45° (54.5% [72/132]) vs >45° (41.9% [49/117]). Similar but less pronounced findings were observed for F-VASI90 and head/neck VASI50, with latitude effects further diminished in body regions less likely to be exposed to sunlight per T-VASI50 and body region VASI50 assessments. Interestingly, patient's perception of facial repigmentation per VNS4/5 achievement was similar by latitude at Week 24 (<35°, 26.1% [30/115]; 35–45°, 20.9% [32/153]; >45°, 22.2% [28/126]) and Week 52 (<35°, 38.6% [39/101]; 35–45°, 35.6% [47/132]; >45°, 35.0% [41/117]).

Conclusion: These findings demonstrate patients achieved repigmentation milestones with ruxolitinib cream regardless of geographic latitude, although limited by proxy use vs direct assessment of sunlight exposure. Latitudes ≤45° North were associated with numerically higher Week 52 facial repigmentation rates; however, there were no differences in rates of total body repigmentation or patient-reported outcomes through Week 52.

Learning Objectives:

1. Identify whether sunlight exposure (using geographic latitude as a proxy) impacts repigmentation in patients with vitiligo

S03.07

Topical Travoprost in Combination with 308 nm Excimer Light and Fractional Carbon Dioxide Laser in the Treatment of Resistant Vitiligo Patches

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Introduction: The treatment of vitiligo remains challenging. Prostaglandin F2 alpha analogs have emerged as a promising treatment option for vitiligo. Bimatoprost and latanoprost have shown efficacy in previous studies. However, the research on travoprost remains limited.

This research aimed to compare the safety and efficacy of topical travoprost 0.004% ophthalmic solution alone and in combination with either 308nm excimer light, fractional CO2 laser, or both in treating vitiligo patches in patients with generalized nonsegmental vitiligo refractory to phototherapy.

Methods, Results: Twenty-six patients complaining of generalized nonsegmental vitiligo refractory to phototherapy completed the study. Four vitiligo patches were randomly chosen in each patient and assigned to one of the following treatment groups: (a) topical travoprost 0.004% ophthalmic solution alone, (b) topical travoprost combined with 308nm excimer light, (c) topical travoprost combined with fractional CO2 laser, or (d) a combination of the three treatment modalities. The changes in the surface area, Vitiligo Area Scoring Index (VASI score), dermoscopic features, and immunohistochemical analysis using Melan A were assessed.

The excimer light and travoprost group showed the highest mean percentage of reduction in surface area and VASI score, followed by the triple combination group. Combining fractional CO2 laser and travoprost was associated with an increase in the mean surface area and the mean VASI score of vitiligo lesions.

Conclusion: Combining excimer light with topical travoprost presents a promising and safe therapeutic option for vitiligo lesions that are un responsive to conventional phototherapy.

Learning Objectives:

- Combining excimer light with topical travoprost is safe and effective in resistance vitiligo patches
- Fractional CO2 laser may induce koebnerization in active vitiligo patches and its better to be avoided

S03.08

Efficacy of Upadacitinib in Adults and Adolescents for Treatment of Nonsegmental Vitiligo: Subgroup Analysis at 48 Weeks of Treatment From Two Phase 3 Studies (Viti-Up)

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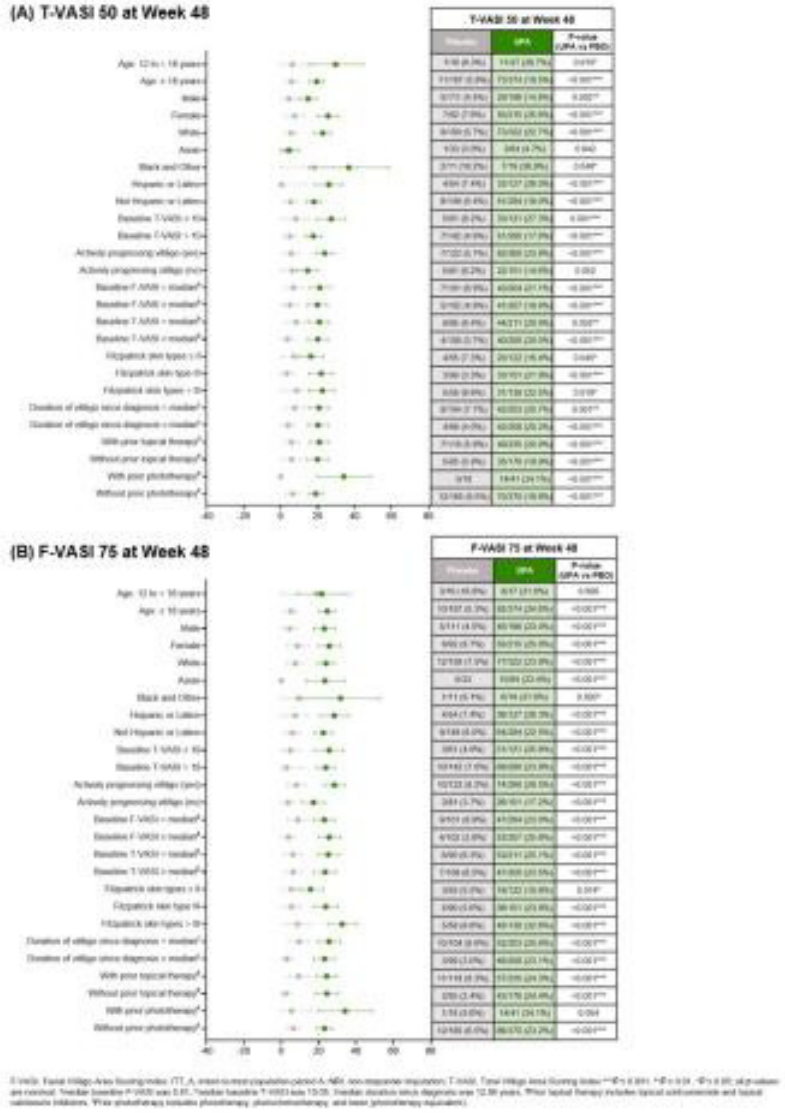
Introduction: Nonsegmental vitiligo (NSV) is an autoimmune disease resulting in skin depigmentation due to a loss of melanocytes. Upadacitinib (UPA) is a selective once-daily Janus kinase inhibitor with demonstrated efficacy for the treatment of NSV in adults and adolescents with no new safety signals reported. Herein we report findings for pre-specified subgroups across various demographics and baseline disease characteristics for patients treated with UPA 15 mg (UPA15) or placebo (PBO) from two identical, pivotal phase 3 studies of patients with NSV (Viti-Up).

Methods, Results: Pre-specified subgroup analyses were conducted for the achievement of each T-VASI 50, F-VASI 75, and F-VASI 50 at week 48, as well as percent change from baseline in each T-VASI and F-VASI at week 48. Overall, patients receiving UPA15 were similarly likely to demonstrate greater improvements vs PBO in the achievement of each T-VASI 50 and F-VASI 75 across the majority of subgroups including biological sex (male, female), ethnicity, baseline disease severity (T-VASI ≤ 10, T-VASI > 10), baseline status of actively progressing vitiligo (yes), baseline F-VASI (< median, ≥ median), baseline T-VASI (< median, ≥ median), Fitzpatrick skin types, duration of vitiligo since diagnosis (< median, ≥ median), and prior topical therapy for vitiligo (with, without) (Figure 1). Patients in subgroups based on race (White, Asian, Black and Other) and without actively progressing vitiligo also demonstrated greater improvements with UPA15 versus PBO for achievement of F-VASI 75 at week 48; however,

for achievement of T-VASI 50 at week 48 for patients in the Asian subgroup or those that did not have actively progressing vitiligo numerical differences favored UPA15 compared to PBO. (Figure 1).

Figure 1. Pre-specified subgroup analyses for achievement of (A) T-VASI 50 and (B) F-VASI 75 at week 48 (ITT_A; NRI).



Conclusion: Findings indicate that treatment of NSV with UPA provides clinically meaningful repigmentation across important subpopulations of patients with NSV.

Learning Objectives:

- To demonstrate that upadacitinib (15 mg) provides clinically meaningful repigmentation of the skin across important subpopulations, defined by demographic or disease characteristics, of patients with nonsegmental vitiligo.

S03.09

Open-Label Multi-Center Randomized Controlled Trial Comparing Topical Ruxolitinib 1.5% Cream with Topical Tacrolimus 0.1% Ointment in Non-Segmental Vitiligo

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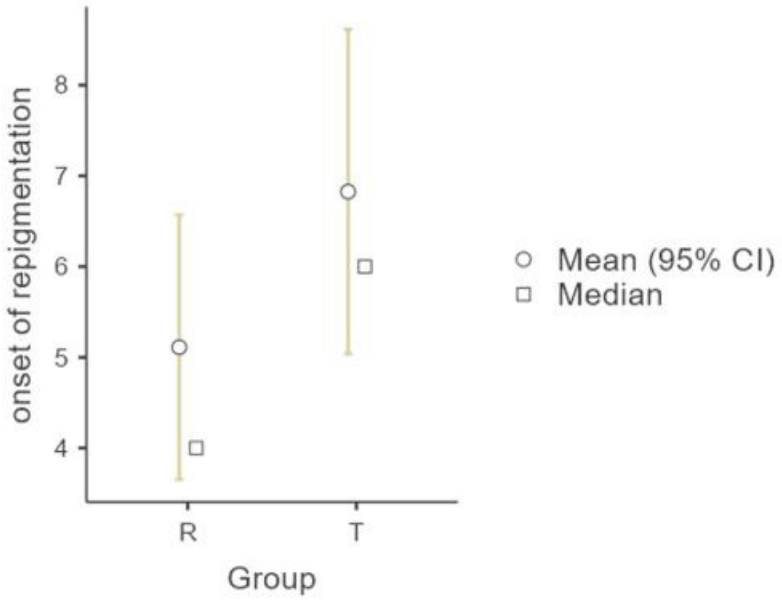
Introduction: This study aimed to compare the efficacy and onset of repigmentation between topical ruxolitinib 1.5% cream and tacrolimus 0.1% ointment in active non-segmental vitiligo (NSV). We evaluated responses across different body regions and compared NB-UVB exposed versus protected sites to assess the impact of phototherapy.

Methods, Results: The 24-week, randomized, parallel-group trial across 11 centers enrolled 72 adults with active NSV. Patients received either ruxolitinib 1.5% cream (Group R) BID (n=37) or tacrolimus 0.1% ointment (Group T) BID (n=35), both combined with whole-body NB-UVB 3x/week. 68 patients completed the protocol (R=36, T=32). Both groups achieved significant repigmentation from baseline ($p<0.001$). Ruxolitinib demonstrated a significantly faster median onset of repigmentation at 4 weeks versus 6 weeks for tacrolimus ($p=0.024$). Patients on ruxolitinib achieved higher degrees of repigmentation throughout the study, however, final head-to-head comparisons showed no significant difference in median VASI improvement (R=45.294%, T=31.875%; $p=0.746$) or fVASI improvement (R=83.396%, T=68.056%; $p=0.865$). Facial repigmentation was superior to body repigmentation in both groups ($p<0.01$ for R, $p=0.015$ for T). Surprisingly, in both arms, repigmentation in UV-protected sites was statistically comparable to exposed body sites ($p>0.05$). The proportion of patients at 6 months of treatment reaching body VASI-25 was 62% for ruxolitinib and 54% for tacrolimus, while fVASI-75 was achieved by 52% of ruxolitinib patients compared to 41% of tacrolimus patients (both $p>0.05$), reflecting the superior repigmentation potential of facial skin in both groups. Adverse effects were minimal, including solitary cases of itching, HSV reactivation, and acne flare in the ruxolitinib group.

Box plot and scatter plot illustrating the onset of repigmentation in weeks for Group R versus Group T with a statistically significant p-value of 0.024.



Conclusion: Both topical ruxolitinib 1.5% and tacrolimus 0.1% are effective and well-tolerated treatments for NSV when combined with NB-UVB. Ruxolitinib provides a significantly faster onset of repigmentation, though final repigmentation levels are comparable between the two therapies across most body sites. Positive results in UV-protected sites warrant further studies without whole-body UV phototherapy.

Learning Objectives:

1. Compare the onset and extent of repigmentation between topical ruxolitinib 1.5% and tacrolimus 0.1% in non-segmental vitiligo.
2. Evaluate the efficacy of topical treatments in narrowband ultraviolet B (NB-UVB) exposed versus protected skin sites.
3. Identify the safety profile and regional response variations of ruxolitinib and tacrolimus.

S03.10

Clinical Pearls in the Use of Monobenzyl Ether of Hydroquinone for Depigmentation in Cases of Extensive Vitiligo: a Retrospective Study

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Introduction: Vitiligo affecting larger body surface area presents a psychological burden and a therapeutic challenge. Depigmentation treatment using monobenzyl ether of hydroquinone (MBEH) provides the main and only FDA approved therapeutic approach; however clinical data guiding the treatment journey are limited. The largest published research included only 53 patients.

The aim of the current study is to evaluate the safety, efficacy and patient satisfaction of MBEH-induced depigmentation therapy in patients with extensive vitiligo. Our Secondary objective is to study factors leading to resistance to treatment or relapse after successful depigmentation.

Methods, Results: A retrospective study was conducted on vitiligo patients, who underwent depigmentation therapy at the Saudi national center of vitiligo in the period between 2015 And 2024. Patient with no documented follow-up visits were excluded. Final response was defined as the time needed to achieve > 90% total depigmentation. Adverse events and patient satisfaction with treatment were also evaluated.

The study included 200 Patients, of whom 77% were females and 23 % were males. The average duration to achieve total depigmentation was 7 ± 3.5 months. Complete depigmentation was achieved in 78% of patients. The face was the earliest area to depigment. The most common side effect was irritant contact dermatitis affecting 90 % of patients. More than 40% percent of females who got pregnant after stopping the treatment experienced variable degrees of repigmentation.

Conclusion: MBEH is an effective depigmentation agent for widespread vitiligo . Proper patient education improves treatment outcomes. Regimentation can occur with sun exposure and hormonal influence

Learning Objectives:

- When to use MBEH for depigmentation?
- Guidelines to safe and effective application
- How to deal with side effects ?
- Off label concentrations of MBEH: availability and effectiveness
- Abuse of MBEH for color lightening in non-vitiliginous patients

Session 4 - Artificial Intelligence in Vitiligo

S04.02

AI-based Semi-automatic Segmentation for Global View Vitiligo Lesion Assessment

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Introduction: Accurate assessment of vitiligo lesion extent is important for evaluating disease severity, monitoring progression, and assessing treatment response. Global-view clinical photographs are particularly valuable because they capture overall lesion distribution and body surface involvement, but accurate segmentation remains challenging due to indistinct lesion borders, variable skin appearance, and complex background content. In addition, fully manual pixel-level annotation required by many AI methods is labor intensive and limits scalability. We therefore investigated a semi-automatic scribble-guided method for global-view vitiligo lesion segmentation.

Methods, Results: We developed an AI-based weakly supervised segmentation framework in which users provide a casually drawn line, referred to as a scribble, to indicate the region of interest. The framework combines spatial attention, feature similarity learning, and spatial continuity constraints to guide lesion localization and refine pixel-wise segmentation without further user intervention. A lightweight architecture with attention residual blocks was designed to enhance lesion relevant features while remaining practical for global-view images. Performance was evaluated on four independent datasets containing 245 images from 87 patients. The proposed method achieved state-of-the-art performance across datasets, with reported accuracy ranging from 93% to 96%, and demonstrated improved robustness in challenging cases with complex backgrounds, subtle lesion borders, and sparse lesion distributions. In a clinical study using a full-body dataset containing 115 images from 7 patients, the framework was further used to estimate the percentage of vitiligo affected body surface area from multi-view photographs. The automated measurements showed strong agreement with expert dermatologist assessment, with a difference of less than 0.2%.

Conclusion: Scribble-guided segmentation provides an effective and clinically meaningful approach for global-view vitiligo assessment while reducing annotation burden. It may support more objective lesion quantification, disease severity evaluation, and treatment monitoring in dermatology practice.

Learning Objectives:

1. Recognize the challenges of segmenting vitiligo lesions from global view clinical photographs for objective disease assessment.
2. Describe how scribble guided segmentation can reduce annotation burden while preserving clinically useful lesion quantification.
3. Understand the potential role of AI based lesion segmentation in supporting body surface area estimation and treatment monitoring in vitiligo.

S04.03

Artificial Intelligence–Assisted Cellular-Resolution Optical Coherence Tomography for In Vivo Characterization of Disease Activity in Vitiligo

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Introduction: Vitiligo is an autoimmune depigmenting disorder with unpredictable disease activity, and objective assessment remains challenging, particularly in early or subtle lesions. Cellular-resolution full-field optical coherence tomography (CRFF-OCT) enables non-invasive, histology-like visualization of skin microstructure. This study aimed to evaluate the feasibility of CRFF-OCT combined with artificial intelligence (AI)-assisted image analysis for differentiating active and stable vitiligo lesions.

Methods, Results: In this prospective study, 50 patients with non-segmental vitiligo were enrolled (2021–2022). CRFF-OCT imaging was performed on lesional, perilesional, and adjacent normal skin within the same anatomical region. Quantitative features related to epidermal architecture, dermal–epidermal junction (DEJ) morphology, and pigment-associated reflectivity were extracted. A computer-aided detection (CADe) system incorporating 13 features was developed, and machine learning models were trained to classify lesion activity. CRFF-OCT identified distinct microstructural patterns between active and stable lesions. Residual pigment-associated reflectivity in the basal epidermis was lower in stable compared with active lesions (9.94% ± 10.06% vs. 21.84% ± 11.08%), with corresponding lesion-to-normal reflectivity ratios of 0.21 and 0.56, respectively. Significant differences were also observed in epidermal thickness, DEJ undulation, mean brightness, and inter-layer contrast. Of the 13

extracted features, 9 were significantly associated with disease activity and included in model development. The AI-assisted system achieved a maximum classification accuracy of 80.6% using a support vector machine model.

Conclusion: CRFF-OCT combined with machine learning enables non-invasive, quantitative characterization of vitiligo activity. This approach may facilitate objective disease assessment and support precision monitoring in clinical practice.

Learning Objectives:

1. To understand the role of CRFF-OCT as a non-invasive, high-resolution imaging modality for assessing microstructural changes in vitiligo.
2. To evaluate the application of AI-assisted image analysis in differentiating active and stable vitiligo lesions using quantitative imaging features.
3. To recognize the potential of integrated imaging and machine learning approaches for objective disease assessment and precision monitoring in vitiligo.

S04.04

Artificial Intelligence-Derived VASI for Point-of-Care Vitiligo Assessment: A Proof-of-Concept Validation Study

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Introduction: Vitiligo is the most common depigmenting skin disorder. The Vitiligo Area Scoring Index (VASI) is widely used to evaluate treatment response but is time-consuming and limited by rater subjectivity. We evaluated a novel smartphone-based AI imaging application for lesion tracking and AI-VASI calculation in a proof-of-concept validation study.

Methods, Results: Six vitiligo patches across four patients undergoing phototherapy were assessed at two time points (12 observations) using an AI-based imaging application. The app generated lesion area measurements (AI-Area) via user-guided tracing, used to calculate AI-VASI. Five trained raters performed conventional VASI assessments (Clinician-VASI) as the primary comparator. Two blinded raters independently segmented clinical photographs using open-source image analysis software (Digital-Area), serving as a reference standard to validate AI-Area accuracy. Pearson correlation, Bland-Altman analysis, and ICC were used to assess method agreement, systematic bias, and inter-rater reliability. Analyses were conducted at the patch level across patients.

AI-VASI correlated strongly with Clinician-VASI (r^2=0.94, $p<0.001$), with close concordance between methods (mean difference 0.74; limits of agreement (LoA) -0.93 to 2.42). Conventional VASI demonstrated only moderate inter-rater reliability (ICC=0.616), highlighting the subjectivity inherent to clinician-based scoring. Digital-Area demonstrated high inter-rater agreement (ICC=0.985), supporting its use as a reproducible reference standard. AI-Area demonstrated excellent agreement with Digital-Area (r^2=0.97, $p<0.001$), with a small systematic underestimation (mean difference -1.79 cm^2; LoA -14.8 to 11.23 cm^2). Across both comparisons, LoA were wider for larger lesions, with trunk patches driving most discrepancy.

Conclusion: This study supports the feasibility of a point-of-care AI imaging application for vitiligo assessment. Strong correlation was observed between AI-VASI and clinician-rated VASI, and between AI vitiligo area and manually segmented area, with closer concordance for smaller lesions. These findings provide a proof-of-concept for the use of AI-assisted imaging to standardize outcome measurement and enhance clinical evaluation in vitiligo.

Learning Objectives:

1. Describe the limitations of conventional clinician-rated VASI in vitiligo assessment and the rationale for AI-assisted outcome measurement.
2. Evaluate the feasibility of AI-VASI as a point-of-care outcome measure for vitiligo, including performance across different lesion sizes and body regions.

Session 5 - Epidemiology

S05.02

Rethinking Skin Cancer Risk in Vitiligo: Evidence from a Meta-analysis, and Clinical Observations

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Introduction: Although the absence of skin pigmentation is typically associated with increased ultraviolet sensitivity, patients and clinicians often assume an elevated risk of skin cancer in vitiligo. However, epidemiological data suggests a reduced incidence of skin cancer in patients with vitiligo. This study aimed to critically appraise the available evidence on the risk of nonmelanoma skin cancer (NMSC) in patients with vitiligo and to describe two relevant clinical observations.

Methods, Results: A meta-analysis was conducted to assess NMSC risk in patients with vitiligo. Nine studies were included. Risk of bias was evaluated using the ROBINS-E tool, identifying two studies with high risk of bias. Random-effects models were used to estimate pooled risk ratios (RR). Additionally, two illustrative clinical cases were analyzed, a patient with Basal Cell Nevus Syndrome (BCNS) who developed vitiligo, and a patient with vitiligo and multiple basal cell carcinomas (BCCs).

The analysis demonstrated a reduced risk of NMSC in patients with vitiligo compared to healthy controls (RR 0.60, 95% CI 0.34–1.07; P = 0.086). After exclusion of high risk of bias studies, the reduced risk was statistically significant (RR 0.52, 95% CI 0.29–0.96; P = 0.035). In the BCNS case, the development of new BCCs stopped following vitiligo onset over an 8-year follow-up period. In the second case, BCC lesions with a depigmented halo showed spontaneous regression in contrast to progressive lesions that remained pigmented, suggesting a localized immune-mediated effect.

Conclusion: This study demonstrates that patients with vitiligo have a reduced risk of NMSC, challenging common assumptions regarding skin cancer vulnerability. The patient cases support a potential protective effect of vitiligo against BCC, possibly mediated by enhanced immune surveillance. These findings have implications for patient counseling and for understanding vitiligo in the context of cancer biology.

Learning Objectives:

1. Recognize the favorable clinical effect of vitiligo on skin cancers after critical appraisal of evidence by meta-analysis.
2. Recognition of clinical cases that illustrate the protective effect of vitiligo on basal cell carcinoma accompanied by a depigmented halo.
3. Implement less stringent advice on UV avoidance in clinical practice.

S05.03

Alopecia Areata in Vitiligo: Prevalence and Clinical Risk Factors in a Moroccan Cohort

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Introduction: Vitiligo is a systemic autoimmune disorder frequently associated with other immune-mediated diseases, including alopecia areata. However, the prevalence and clinical predictors of alopecia areata in vitiligo remain insufficiently defined, particularly in North African populations.

Methods, Results: We conducted a cross-sectional prospective study between 2014 and 2024 including 418 Moroccan patients with vitiligo. All patients underwent standardized clinical evaluation and thyroid assessment. The mean age was 39 years, and the median age at vitiligo onset was 10 years. Non-segmental vitiligo was predominant (93%), and 27.5% of patients reported a family history. Alopecia areata was identified in 3% of cases, while autoimmune thyroid disease and atopy were present in 26% and 5%, respectively. Univariate analysis demonstrated that male sex (OR = 4.74, p = 0.013) and atopy (OR = 4.2, p = 0.042) were significantly associated with

alopecia areata, with a trend for post-pubertal onset (OR = 3.71, p = 0.052). Facial involvement was negatively associated (OR = 0.31, p = 0.047). No significant associations were found with age, disease duration, stress, or extent of vitiligo.

Conclusion: Alopecia areata represents a clinically relevant comorbidity in vitiligo, with identifiable risk profiles. These findings provide novel data from a North African cohort and support shared autoimmune mechanisms. Targeted screening in high-risk patients may improve early detection and optimize multidisciplinary management.

Learning Objectives:

1. Describe the prevalence of alopecia areata in patients with vitiligo.
2. Identify key clinical risk factors associated with alopecia areata in vitiligo.
3. Apply risk-based screening strategies for autoimmune comorbidities in vitiligo patients.

Session 6 - Surgical Treatment

S06.02

Residual Cytotoxic Immune Activity Predicts Repigmentation Outcomes After Suction Blister Epidermal Grafting in Stable Vitiligo

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Introduction: Suction blister epidermal grafting (SBEG) is an effective surgical option for stable vitiligo; however, repigmentation outcomes remain variable. Clinical stability does not necessarily reflect immunologic quiescence, and reliable predictors of surgical success are lacking. This study aimed to identify clinical and immunologic predictors of repigmentation outcomes following SBEG.

Methods, Results: In this longitudinal cohort study, 296 patients with stable vitiligo who underwent SBEG between 2017 and 2023 were included. Repigmentation outcomes were assessed over ≥12 months, with good response defined as ≥75% repigmentation. Clinical variables and preoperative serum biomarkers, including interferon-γ (IFN-γ), CXCL9, CXCL10, and Granzyme B, were analyzed using multivariable logistic regression.

The mean repigmentation rate was 78.1%, with 80.1% achieving ≥75% repigmentation and 61.5% achieving ≥90% repigmentation after a single procedure. Acral lesion location (adjusted odds ratio [aOR] 0.159, 95% CI 0.057–0.445) and a positive family history of vitiligo or autoimmune disease (aOR 0.378, 95% CI 0.160–0.895) were independently associated with poorer outcomes. Elevated baseline serum Granzyme B levels were associated with reduced repigmentation, whereas IFN-γ, CXCL9, and CXCL10 were not. Repigmentation outcomes were comparable between segmental and non-segmental vitiligo.

Conclusion: Residual cytotoxic immune activity, reflected by elevated Granzyme B, is associated with poorer repigmentation following SBEG despite clinical stability. Integrating immunologic assessment may improve patient selection and surgical outcomes in vitiligo.

Learning Objectives:

1. To evaluate clinical and immunologic predictors of repigmentation outcomes following suction blister epidermal grafting in stable vitiligo.
2. To understand the role of cytotoxic immune activity, particularly Granzyme B, in influencing surgical outcomes despite clinical stability.
3. To recognize the importance of integrating immunologic assessment into preoperative evaluation to optimize patient selection and counseling.

S06.03

Efficacy of Skin Micrograft SuspensionPrepared by Tissue lyser versus Cryolysis using Liquid Nitrogen in The Treatment of Stable Resistant Vitiligo

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Introduction: Vitiligo is an acquired depigmenting disorder in which cellular grafting provides a valuable option in treating stable cases.

Methods, Results: In a prospective right–left comparative trial, 20 patients with stable vitiligo received CSMS on the left side and TSMS on the right. Flow cytometric assessment of the cell suspension was done. Clinical outcomes (Global Assessment Improvement Scale [GAIS], Visual Analog Scale [VAS]), Patients' satisfaction, and histopathological/cytological analyses were assessed after 6 months.

Both groups achieved significant repigmentation. > 51% repigmentation was achieved in 50% of the group treated with CSMS, and 45 % of the group treated with TSMS; differences between both groups were not statistically significant. Histopathology demonstrated melanocyte restoration (HMB-45 positive), while cytology (Melan-A, CD44) and flow cytometry confirmed viable melanocytes and dermal stem cells in both suspensions.

Photo 1 (a): Female patient before, after 3 & 6 months of CSMS therapy showing excellent response at the left eyebrow.

Photo 1 (b): Female patient before, after 3 & 6 months of TSMS therapy showing excellent response at the right eyebrow.

Conclusion: CSMS and TSMS are comparably safe and effective for stable vitiligo at 6 months of stability. CSMS offers a simpler, cost-effective, office-based alternative without compromising efficacy.

Learning Objectives:

- To compare outcomes of two noncultured, nontrypsinized skin micrograft suspensions (SMS): cryolysis-based (CSMS) and tissue lyser-based (TSMS) in the treatment of stable resistant vitiligo.
- Both were single minimally invasive procedures with acceptable outcomes without any associated treatments, especially in difficult-to-treat areas with surgery.

S06.04

Efficacy and Long-Term Outcomes of Noncultured Epidermal Cell Suspension Grafting using Suction Blisters as Donor Tissue

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Introduction: Noncultured epidermal cell suspension (NCES), is done in patients with stable, refractory vitiligo. The objective of this study is to evaluate the efficacy and long-term maintenance repigmentation in patients with recalcitrant vitiligo treated with NCES using suction blisters as donor tissue.

Methods, Results: A retrospective review was conducted of all patients who underwent NCES using suction blisters as donor tissue at VeraSkin Private Practice in Mexico. Inclusion criteria required at least 6 months FU visit and stable vitiligo for 12 months. 10 patients were included (see Table 1).

The NCES procedure was performed according to the protocol described by Jeong et al. Patients were instructed to initiate narrowband UVB (NB-UVB) phototherapy one week post-transplantation, twice weekly. Repigmentation was evaluated at 3, 6, and 12 months using standardized photography and a 6-point grading scale (G0: no change; G1: 1–25%; G2: 26–50%; G3: 51–75%; G4: 76–99%; G5: 100%).

At 3 months, 80% of patients achieved G1 repigmentation and 20% achieved G2. At 6 months, outcomes improved: G1 (30%), G2 (40%), G3 (10%), and G4 (20%). At 12 months, repigmentation was distributed as follows: G2 in 33.3%, G3 in 22.2%, and G4 in 44.4% of patients.

Two patients with G2 repigmentation underwent a second NCES procedure, with a reduction in the donor-to-recipient ratio from 1:10 to 1:3, achieving greater than 75% repigmentation (G4) at 6-month follow-up. Five patients were followed beyond 12 months (up to 42 months), all maintaining greater than 90% repigmentation.

Greater repigmentation (>75%) was associated with lower donor-to-recipient ratios (1:5–1:3) and shorter trypsinization times (≤20 minutes), whereas moderate improvement (25–50%) was associated with higher ratios (1:10) and longer trypsinization times (up to 40 minutes).

Table 1. Patient's demographics

Sex Male Female	 n= 3 n= 7
Mean age	28 (± 11) years
Race Hispanic (n=10)	 100%
Fitzpatrick skin type III (n= 4) IV (n=6)	 40% 60%
Vitiligo type Segmental/other (n=8) Generalized (n=2)	 80% 20%
Donor site location	Hip
Recipient sites Face and neck (n= 7) Chest (n=2) Hip (n=1)	 70% 20% 10%
Mean area recipient	24.7cm 2 (± 18.4)
Mean number of blisters per procedure	6.2 (± 2.6)
Donor:recipient site ratio 1:2.5 (n= 2) 1:3 (n= 3) 1:5 (n=2) 1:10 (n= 3)	 20% 30% 20% 30%
Incubation time (min)	30

Conclusion: NCES is an effective treatment, demonstrating sustained long-term repigmentation. Factors such as donor-to-recipient ratio, trypsinization time and NBUVB post surgery, influence treatment success. Further studies are warranted.

Learning Objectives:

1. Evaluate the efficacy and long-term outcomes of noncultured epidermal cell suspension (NCES) using suction blister grafts in patients with stable, refractory vitiligo.
2. Identify key procedural factors influencing repigmentation success, including donor-to-recipient ratio and trypsinization time.

Session 7 - Basic Science

S07.02

miR-2909 Impairs Mitochondria–Melanosome Crosstalk to Restrict Melanogenesis Through the Klf4–Mfn2–NCKX5 Axis

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Introduction: Melanosome biogenesis and maturation are energy-dependent processes that require coordinated functional coupling between mitochondria and developing melanosomes. Emerging evidence suggests that disruption of organelle crosstalk contributes to melanocyte dysfunction in vitiligo. However, the molecular regulators governing mitochondria–melanosome interaction remain poorly defined.

Methods, Results: Primary human melanocytes were transfected with miR-2909 mimic or subjected to Klf4 modulation. Gene and protein expression analyses were performed to evaluate mitochondrial dynamics and melanosome maturation markers. Ultrastructural alterations were assessed using transmission electron microscopy (TEM), and organelle co-localization was examined via confocal microscopy. Functional validation was conducted in clinical vitiligo samples undergoing repigmentation therapy.

miR-2909 overexpression significantly compromised mitochondrial function and reduced expression of Mfn2 and NCKX5 at both transcriptional and protein levels, indicating impaired mitochondria–melanosome interaction. Mechanistically, miR-2909 downregulated Klf4, leading to suppression of Mfn2. Klf4 overexpression rescued Mfn2 levels, whereas Klf4 silencing markedly reduced Mfn2 expression and disrupted melanosome maturation. Ultrastructural analysis revealed decreased mitochondrial number, altered mitochondrial morphology, diminished mitochondria–melanosome proximity, and accumulation of immature (stage I–II) melanosomes. Mfn2-dependent regulation of NCKX5 altered intracellular calcium homeostasis, subsequently affecting PMEL processing, TYR activity, and melanin synthesis. Importantly, clinical repigmentation was associated with reduced miR-2909 expression and restoration of Mfn2/NCKX5 levels.

Conclusion: miR-2909 acts as a negative regulator of melanogenesis by disrupting the Klf4– Mfn2–NCKX5 axis thereby impairing mitochondrial integrity, organelle interaction, and melanosome maturation. Therapeutic targeting of miR-2909 may represent a novel strategy to restore pigmentation in vitiligo.

Learning Objectives:

This study investigates the role of miR-2909 in modulating mitochondria melanosome interaction through the following objectives:

1. To determine the role of miR-2909 in regulating genes involved in mitochondria–melanosome interaction (Mfn2, NCKX5).
2. To elucidate miR-2909–mediated regulatory pathway disrupting this interaction in vitro.
3. To evaluate the relevance of this molecular pathway in vitiligo patients.

S07.03

Circulating and Resident Memory T Cells in Different Stages and Extents of Non Segmental Vitiligo

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Introduction: Non-segmental vitiligo (NSV) involves complex immune-genetic interactions. While Tissue Resident Memory (TRM) cells are known to drive localized relapses, this study investigates their relation as well as Circulating Central Memory (TCM) to disease duration and extent.

Methods, Results: This study evaluated 57 NSV patients categorized by disease duration (short: ≤ 6 months; long: > 6 months) and extent; localized (1-2 lesions in the same anatomical site) vs. generalized (lesions in different sites), and 18 healthy controls. Circulating Central Memory T cells (TCM) were analyzed via blood sample CD8, CD3, CCR7, CD45RO staining and skin TRM cells through immunofluorescent staining (CD8+ and CD69+) of perilesional and non-lesional skin biopsies.

Circulating Cells: All NSV patients showed significantly lower blood TCM levels compared to controls ($P<0.001$). Notably, long-standing generalized disease showed lower TCM levels than short-duration disease ($P=0.032$).

Tissue Resident Cells: In localized disease, CD8+ and CD69+ expression was significantly higher in both perilesional and non-lesional skin compared to controls, correlating positively with activity.

Duration Impacts: Short-duration localized cases showed higher non-lesional CD8+ ($P=0.044$) and perilesional CD69+ ($P=0.016$) expression than long-duration cases. Similar patterns of elevated CD8+ and CD69+ were observed in generalized cases, with significantly higher expression in short-duration cohorts.

Extent Impacts: Generalized cases showed significantly higher perilesional and non-lesional CD8+ ($P<0.001$ for both) and CD69+ ($P<0.001$ for both) expression compared to localized cases and controls.

Conclusion: The study demonstrates that memory T-cell formation occurs very early in NSV, even appearing in non-lesional skin during the initial localized phase. This suggests that "early localized" disease is a precursor to progressive spread. While systemic therapy may halt progression, further research is required to determine if early intervention can prevent the initial accumulation of TRM in non-lesional skin and thereby prevent future relapses.

Learning Objectives:

1. Vitiligo is a progressive disease. Formation and spread of memory T-cells starts very early in the disease process and appears in perilesional and non-lesional skin even in early localized cases. This warrants considering vitiligo a systemic disease with the appearance of the first lesion and warns us of the high risk of disease spread to other sites and recurrence at same sites.
2. Previous studies showed that early systemic treatment can halt disease progression, however we need to study whether early systemic therapy for localized disease can stop TRM accumulation in non-lesional skin and thereby possibly prevent relapses on the long term or not.

S07.04

Immune Cell Profiling Reveals Macrophage Dysregulation as a Pathogenic Driver and Therapeutic Target for Vitiligo

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Introduction: Melanocyte death in vitiligo involves both immune activation and oxidative stress. However, the precise molecular and cellular mechanisms underlying this process remain incompletely understood. In this study, we aimed to characterize the cellular landscape of the skin microenvironment in vitiligo and to elucidate its pathogenic significance, using atopic dermatitis as a comparative condition.

Methods, Results: Paired lesional and perilesional skin biopsies from vitiligo patients were analyzed using bulk transcriptomics coupled with cellular deconvolution, with healthy normal skin and eczema samples serving as controls. Novel cellular differences were validated by flow cytometry and immunohistochemistry, and their functional relevance was assessed using cellular and animal models. We observed that monocyte-macrophages were significantly enriched in vitiligo lesional skin, albeit to a lesser extent than in atopic dermatitis lesions. Furthermore, macrophage polarization in vitiligo was skewed toward the proinflammatory M1 phenotype and away from the pro-homeostatic M2 phenotype, resulting in a reduced M2/M1 ratio. In mouse models, experimental enhancement of M2 macrophages using the M2 functional mediator maresin 1 significantly inhibited the development of both vitiligo and atopic dermatitis. In addition, in vitro treatment of cultured human epidermal melanocytes with maresin 1 protected these cells from oxidative-stress-induced death.

Conclusion: Macrophages are enriched in the skin microenvironment of both vitiligo and atopic dermatitis. In vitiligo, these macrophages exhibit a functional shift toward the proinflammatory M1 state and away from the pro-resolution, pro-homeostatic M2 state. Correcting this imbalance with the M2 functional mediator maresin 1 suppressed disease development in animal models. Thus, maresin 1 and other M2 agonists hold promise as future therapies for vitiligo and atopic dermatitis. Moreover, because maresin 1 directly inhibits immune-independent melanocyte death induced by cellular stress, M2 agonists may theoretically provide more comprehensive melanocyte protection compared to conventional immune-targeting therapies such as tacrolimus and JAK inhibitors.

Learning Objectives:

Macrophages are enriched in the skin microenvironment of both vitiligo and atopic dermatitis. In vitiligo, these macrophages exhibit a functional shift toward the proinflammatory M1 state and away from the pro-resolution, pro-homeostatic M2 state. Correcting this imbalance with the M2 functional mediator maresin 1 suppressed disease development in animal models. Thus, maresin 1 and other M2 agonists hold promise as future therapies for vitiligo and atopic dermatitis. Moreover, because maresin 1 directly inhibits immune-independent melanocyte death induced by cellular stress, M2 agonists may theoretically provide more comprehensive melanocyte protection compared to conventional immune-targeting therapies such as tacrolimus and JAK inhibitors.

S07.05

Unilateral Peibaldism: Presentation of Two Cases Demonstrating a New Subtype

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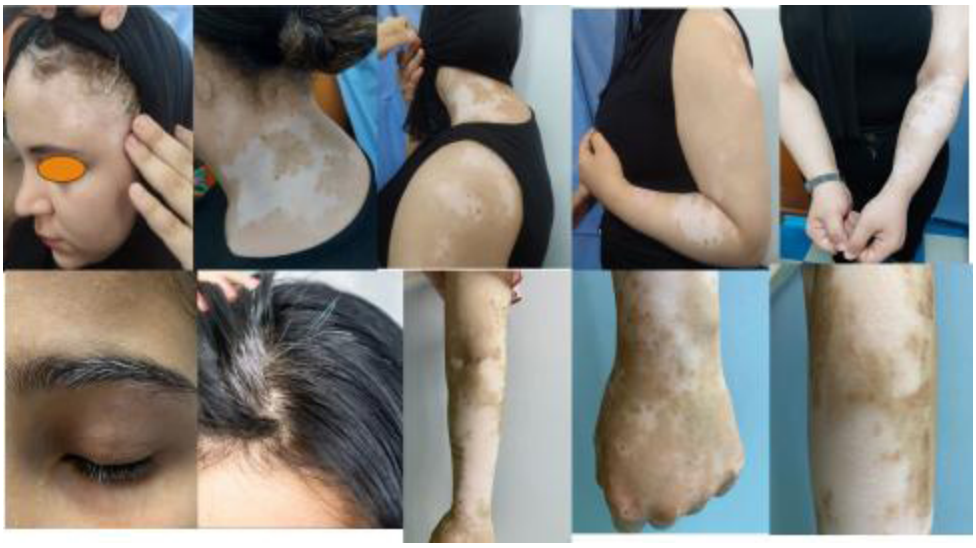
Introduction: Piebaldism is an autosomal dominant disorder affecting melanocyte migration and development, characterized by isolated congenital leukoderma and poliosis in a distinct ventral midline pattern. Atypical presentations of peibaldism are rarely reported.

Case Report: Two cases were reported. *Case (1)*: Female patient aged 17 years presented with depigmented macules and patches on her left upper limb, neck, and left side of her face, which started in her first year of life, treated as vitiligo by different courses of topical, systemic, and phototherapy treatments since then till now with no improvement. On examination, she demonstrated depigmented patches with hyperpigmented macules within the depigmented lesions; a tuft of depigmented hair was demonstrated on the left side of the hairline, surrounded by a depigmented patch studded with hyperpigmented macules. She was diagnosed with unilateral peibaldism. NCES was done with excellent improvement.

Case (2): Female patient aged 15 years presented with depigmented macules and patches on her left upper limb. The condition started in her first year of life, treated as vitiligo by different courses of topical, systemic, and phototherapy treatments for 14 years with no improvement. On examination, she was presented with depigmented patches with hyperpigmented macules encountered within the depigmented lesions, poliosis of the left eyebrow and eyelashes, and a tuft of depigmented hair was demonstrated on the frontoparietal junction of her scalp. She was diagnosed with unilateral peibaldism.



Learning Objectives:

- To report atypical presentation of peibaldism and differentiate it from other depigmentation disorders like segmental vitiligo, nevus depigmentosus.

S07.06

Glucose Transporter-1 (GLUT-1) Upregulation in Vitiligo: a Possible Link to Skin Depigmentation

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Introduction: Vitiligo is a prevalent autoimmune skin disorder characterized by progressive depigmented patches of the skin and/or mucosa. Lately, extensive research has been investigating molecular pathogenesis underlying vitiligo, epidermal-immune cell crosstalk, structural aberrations in cellular skin components and immune cell metabolism derangements. Glucose transporter-1 (*GLUT-1*) has recently proved to be increased in proinflammatory conditions and autoimmune diseases. *GLUT-1* expression is upregulated in rheumatoid arthritis, systemic lupus erythematosus, psoriasis and chronic spongiotic dermatitis.

Methods, Results: The study included 30 vitiligo patients "vitiligo vulgaris" and 30 healthy individuals. Biopsies of the patients' lesional vitiligo skin and the control group's normal skin were obtained. They were all tested for *GLUT-1* mRNA expression using real-time polymerase chain reaction (RT-PCR) and *GLUT-1* antibody expression using immunohistochemistry (IHC). Hematoxylin and eosin (H&E) staining for the specimens was additionally done for histopathological assessment.

GLUT-1 expression was upregulated in lesional skin of vitiligo patients compared to normal control skin (*P*-value < 0.001). Also, lesional specimens from stable disease showed more *GLUT-1* expression than active disease but without a significant difference (*P*-value = 0.283). There was no significant correlation between the proposed vitiligo histological scoring system and vitiligo signs of the disease activity score.

Conclusion: *GLUT-1* could play a crucial role in vitiligo disease onset, persistence and progression, through keratinocyte-melanocyte-fibroblast-immune cell crosstalk, being the initially deranged metabolic pathway for all these cells giving an insight into vitiligo metabolomics.

Learning Objectives:

- To investigate *GLUT-1* expression in vitiligo

Session 9 - Assessment of Vitiligo Severity, Impact and Therapeutic Response

S09.02

Assessing Genetic, Phenotypic, and Polygenic Risk Associations of Autoimmune Comorbidities in FinnGen Patients with Vitiligo

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Introduction: Vitiligo is an autoimmune skin disease characterized by loss of skin pigmentation due to melanocyte destruction. Polygenic risk factors are known to contribute significantly to its development. Individuals with vitiligo often exhibit higher prevalence of autoimmune comorbidities, suggesting shared genetic and immunological background. Utilizing FinnGen study data, this study investigated genetic, phenotypic, and polygenic risk associations of autoimmune comorbidities in Finnish patients with vitiligo.

Methods, Results: A genome-wide association study (GWAS) detected genetic variants linked to vitiligo. Phenotypic analyses compared patients with vitiligo to matched controls, and patients with vitiligo in the top 20% of ≥1 predefined vitiligo polygenic risk score (PGS) distribution to those not in the top 20% of vitiligo PGS distributions. Analysis of the impact of PGS on risk of comorbidities compared all patients with vitiligo and patients in the top 20% of ≥1 vitiligo PGS distribution.

629 patients with vitiligo and 388,760 controls were included. The GWAS confirmed previously reported associations. In the excess comorbidities analysis, vitiligo conferred phenome-wide significant increased risk of alopecia areata, atopic dermatitis, multiple thyroid gland disorders, rheumatoid arthritis (RA), and vitamin B12 deficiency anemia vs controls. Patients in the top 20% of ≥1 vitiligo PGS had significantly increased risk of type 1 diabetes (T1D) and thyroid gland disorders compared to those not in the top 20% of vitiligo PGS. In the PGS analysis, vitiligo conferred significantly higher risk of developing psoriasis, T1D, RA, and hypothyroidism, and lower risk of developing multiple sclerosis compared to controls. Associations were stronger among the top 20% of PGS distributions

Conclusion: This is the first study highlighting genetic and polygenic contributions to vitiligo and its autoimmune comorbidities in FinnGen patients. Individuals with higher vitiligo PGS exhibited elevated risk for several comorbid autoimmune diseases, supporting polygenic risk profiling utility in risk stratification and personalized care.

Learning Objectives:

1. Integrating genomic, phenotypic, and polygenic risk data is of value to guide towards targeted interventions in autoimmune diseases
2. Polygenic risk profiling may support risk stratification and personalized monitoring for autoimmune comorbidities in patients with vitiligo
3. Screening for vitamin B12 deficiency and type 1 diabetes may be considered in patients with vitiligo and higher genetic risk burden

S09.03

Dopamine Level in Urine and Serum of Stable Non-segmental Vitiligo Patients Before and after Excimer Light Therapy

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Introduction: Vitiligo is a chronic skin disorder characterized by depigmented patches and due to neurochemical factors, such as increased catecholamine release from autonomic nerve terminals in the melanocyte microenvironment. Dopamine has been implicated in both the onset and progression of vitiligo. The mechanism of excimer light 308nm in vitiligo is much more like narrow band UVB as it induces stabilization and repigmentation through localized immunesuppression and immunemodulation.

Methods, Results: Twenty-one patients participated in a course of excimer light therapy administered twice weekly for a total of 20 sessions. Dopamine levels in serum and urine were evaluated using ELISA kits before and after therapy.

We demonstrated a significant reduction in both serum and urine dopamine levels after completion of excimer light therapy, accompanied by a notable improvement in patients' quality of life.

Conclusion: Vitiligo is influenced not only by immunological and genetic factors but also by psychological and neurochemical variables. dopamine may play a role in disease activity and treatment response. Excimer light therapy appears to modulate these neurochemical pathways while improving clinical and patient-reported outcomes. The research raises the possibility of considering neurochemical regulation in the management of vitiligo and supports the use of excimer light therapy as an effective, non-invasive intervention that can enhance both physiological and psychosocial aspects of the disease.

Learning Objectives:

1. Measure serum and urine dopamine levels in patients with stable non-segmental vitiligo before and after treatment with 308 nm excimer light therapy.
2. Assess the therapy's effectiveness along with its impact on quality of life using the Area and Score Index (VASI) score and the VitiQOL questionnaire.

S09.04

Prospective Registry Evaluating Narrowband UVB Phototherapy in Non-Segmental Vitiligo Patients - a Study Protocol

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Introduction: Narrowband ultraviolet B (NB-UVB) phototherapy is considered first-line treatment for widespread or rapidly progressive non-segmental vitiligo. Despite its widespread use in daily practice, longitudinal real-world data on vitiligo treatment outcomes remain limited, as existing evidence is largely derived from randomized controlled trials in selected patient populations. This study describes the design of a prospective registry to evaluate NB-UVB outcomes in routine clinical practice.

Methods, Results: This prospective observational cohort registry was initiated at Amsterdam University Medical Center, a tertiary referral center with extensive experience in NB-UVB phototherapy. Adults (≥18 years) with non-segmental vitiligo prescribed NB-UVB are included. Standardised clinical assessments and patient-reported outcome measures are collected at baseline, 6 months, 12 months, and 6 months after treatment completion.

The primary outcome is change in Vitiligo Area Scoring Index (VASI). Secondary outcomes include satisfaction, quality of life, adverse events, maintenance of repigmentation, and patient- or disease-related factors associated with outcomes. Continuous outcomes are analysed using linear mixed-effects models, while ordinal outcomes are summarised descriptively.This registry will generate longitudinal real-world data on effectiveness, safety, durability of repigmentation, and prognostic factors in a heterogeneous patient population

Conclusion: This prospective registry will provide valuable insights into real-world NB-UVB treatment outcomes in non-segmental vitiligo and support more evidence-based and patient-centered management strategies.

Learning Objectives:

1. Recognize the need for prospective real-world data on narrowband ultraviolet B phototherapy in non-segmental vitiligo.
2. Utilize standardized assessment tools to more accurately monitor treatment effectiveness and patient satisfaction in daily practice.

S09.05

Patient-Reported Vitiligo Journey, Management, and Stigma in the U.S.: Findings from the National Health and Wellness Survey

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Introduction: Vitiligo is often associated with psychosocial impacts and impaired quality of life. This study explored the vitiligo patient journey and disease burden.

Methods, Results: Data are from the 2025 National Health and Wellness Survey (NHWS), a general population based, self-reported, cross-sectional, online survey, conducted by Oracle Life Sciences. Results were weighted to reflect the demographic distribution of the adult (≥18 years) U.S. population.

Among respondents with self-reported clinically diagnosed vitiligo (unweighted: n=526; weighted: n=1.8M), mean (SD) age was 52.8 (17.5) years and 55.3% were female. Mean (SD) time since first vitiligo diagnosis was 17.7 (16.3) years; 48.9% reported mild disease at first diagnosis (**Table**). Back of hand and finger (35.9%) and facial eye area (29.0%) were the most commonly reported body regions with vitiligo lesions. 22.1% reported "Mild depression" and 35.3% "Moderate-to-severe depression" symptoms in the past two weeks (PHQ-9 scale). Participants reported experiencing stigma because of their vitiligo, including shame (23.2%), discrimination (21.6%), and anger (18.8%). Most individuals (60.9%) reported not currently receiving any medical treatment or light therapy, with the top three reasons being "No desire to try treatment/Can manage vitiligo without treatment" (41.5%), "No active vitiligo" (28.7%) and "Cost of treatment was too high" (11.3%). For those receiving prescription medication treatment for their vitiligo at the time of the survey (25.1%), the most common prescriptions were immunosuppressants (42.2%) and corticosteroids (41.6%). Treatment dissatisfaction was reported by 23.6% and 27.6% of patients receiving immunosuppressants and corticosteroids.

Table. Vitiligo characteristics for adults with self-reported clinically diagnosed vitiligo in the U.S.

	Diagnosed vitiligo population Weighted N=1.8 M
Diagnosing provider type, %	
Primary Care Physician/GP/Internist	39.7
Other/Not reported	30.5
Dermatologist	29.8
Mean (SD) time since first diagnosis, years	17.7 (16.3)
Mean (SD) age at first diagnosis, years	36.5 (20.5)
Self-reported severity of vitiligo at first diagnosis, %	
Mild	48.9
Moderate	24.6
Severe	10.6
Very severe	4.5
Don't know/Unknown/Not reported	11.4
Current severity, %	
Mild	59.5
Moderate	28.9
Severe	11.6

Most Common Part(s) of the body* currently affected by vitiligo, %	
Hands – back of hands or fingers	35.9
Face – eye area	29.0
Lower arms	27.1
Lower legs	24.8
Knees	24.4
Face – rest of face (excluding eye area or inside of the mouth and nostrils)	21.2
Hands – palms	12.8
Face – inside of the mouth and nostrils	11.3
PHQ-9† score, %	
0-4 ("none-minimal depression")	42.6
5-9 ("mild depression")	22.1
10-14 ("moderate depression")	15.8
15-19 ("moderately severe depression")	13.1
20-27 ("severe depression")	6.4
Perceived stigma, %	
"Others treat me negatively if they know I have vitiligo (discrimination)	
Strongly disagree/Disagree/Somewhat disagree	65.4
Neutral	13.0
Strongly agree/Agree/Somewhat agree	21.6
"I feel embarrassed because of the way people treat me if they know I have vitiligo" (shame)	
Strongly disagree/Disagree/Somewhat disagree	63.0
Neutral	7.3
Strongly agree/Agree/Somewhat agree	23.2
"I feel angry because of the way people treat me if they know I have vitiligo" (anger)	
Strongly disagree/Disagree/Somewhat disagree	67.5
Neutral	13.7
Strongly agree/Agree/Somewhat agree	18.8
Reasons for not receiving current treatment‡, %	
"No desire to try treatment/Can manage vitiligo without treatment"	41.5
"No active vitiligo"	28.7
"Cost of treatment was too high"	11.3
"Treatment did not work"	8.5
"Did not like treatment(s) that were tried previously"	7.1
Other	13.3
Current prescription medication(s) used to treat vitiligo§, %	
Immunosuppressant	42.2
Corticosteroid	41.6
Vitamin D analog	16.9
Topical Janus kinase inhibitor	15.0

Psoralen	8.1
Other prescription	25.4
Satisfaction with immunosuppressant treatment among those currently using, %	
Extremely dissatisfied/Very dissatisfied/Somewhat dissatisfied	23.6
Neither dissatisfied nor satisfied	9.6
Extremely satisfied/Very satisfied/Somewhat satisfied	66.8
Satisfaction with corticosteroid treatment among those currently using, %	
Extremely dissatisfied/Very dissatisfied/Somewhat dissatisfied	27.6
Neither dissatisfied nor satisfied	10.0
Extremely satisfied/Very satisfied/Somewhat satisfied	62.4

M, million; PHQ-9, 9-Item Patient Health Questionnaire.
*Non-inclusive list, parts of the body with ≥24% currently affected. Parts of body with <24% presented to include all aspects of a part of the body measured by the survey noted in this table.
†The PHQ-9 is a 9-question questionnaire that assesses the severity of an individual's depression symptoms over the last two weeks. Individuals respond on a 4-point scale ranging from "not at all (0 points) to "Nearly every day" (3 points). Answers are then summed, with a higher score indicating higher severity.
‡n=1.1M.
§n=0.5M.

Conclusion: Most respondents with self-reported clinically diagnosed vitiligo reported experiencing some level of depression. Only some participants reported experiencing stigma because of their vitiligo, reflecting potential cultural differences between the U.S. and other countries leading to heterogenous experiences among individuals. Many patients are untreated and a notable proportion were dissatisfied with their treatment, highlighting an unmet need for new, effective treatments.

Learning Objectives:

1. Outline the patient journey for patients with vitiligo in the U.S., including areas affected, self-reported severity at initial diagnosis, and type of medical treatment and satisfaction with current treatment.
2. Discuss the disease burden experienced among respondents with vitiligo in the U.S., including the types of stigma and the severity of depression.

S09.06

Occupational Impairment and Job-Searching Difficulties in Patients with Vitiligo: A Multicenter Cross-Sectional Study

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Introduction: Vitiligo is a chronic depigmented skin disorder affecting 0.5–1% of the global population and is associated with a profound psychosocial burden. However, its specific impact on occupational functioning and workplace experiences remains underexplored. This study aimed to evaluate the extent of occupational impairment and identify contributing factors among patients with vitiligo.

Methods, Results: A multicenter cross-sectional survey was conducted in Korea, involving 322 adult patients with vitiligo who were either employed or seeking employment after disease onset. A self-administered questionnaire was used to assess difficulties and disadvantages encountered in professional settings, including workplace experiences and job-searching processes. In the workplace, 63% of participants reported difficulties, and 14% experienced disadvantages. Multivariable analysis identified female sex (aOR 1.77, p=0.041), body surface area (BSA) >1% (aOR 3.30, p=0.003), and client-facing roles (aOR 1.85, p=0.023) as independent predictors of workplace difficulties. Workplace disadvantages were significantly associated with a disease duration of ≥1 year (aOR 2.73, p=0.016), BSA >1% (aOR 3.41, p=0.027), and client-facing roles (aOR 2.66, p=0.026). Regarding the job-searching process, 44% reported difficulties and 27% experienced disadvantages. While not statistically

significant in the multivariable model, univariable analysis indicated that younger age (19–39 years), larger affected area (BSA >1%), and greater time burden for clinic visits (≥1 hour per visit) were associated with increased difficulties.

Conclusion: Vitiligo imposes a substantial burden on employment opportunities, career progression, and daily workplace experiences. These findings underscore the need for supportive institutional policies and increased social awareness to mitigate the occupational challenges faced by patients with vitiligo.

Learning Objectives:

- To understand the extent of occupational impairment and job-searching difficulties experienced by patients with vitiligo.
- To identify the factors associated with workplace difficulties and disadvantages in patients with vitiligo.

S09.07

Caring through Sharing: Shared Decision-Making in the Treatment of Non-Segmental Vitiligo — A Cross-Cultural Exploratory Survey Study

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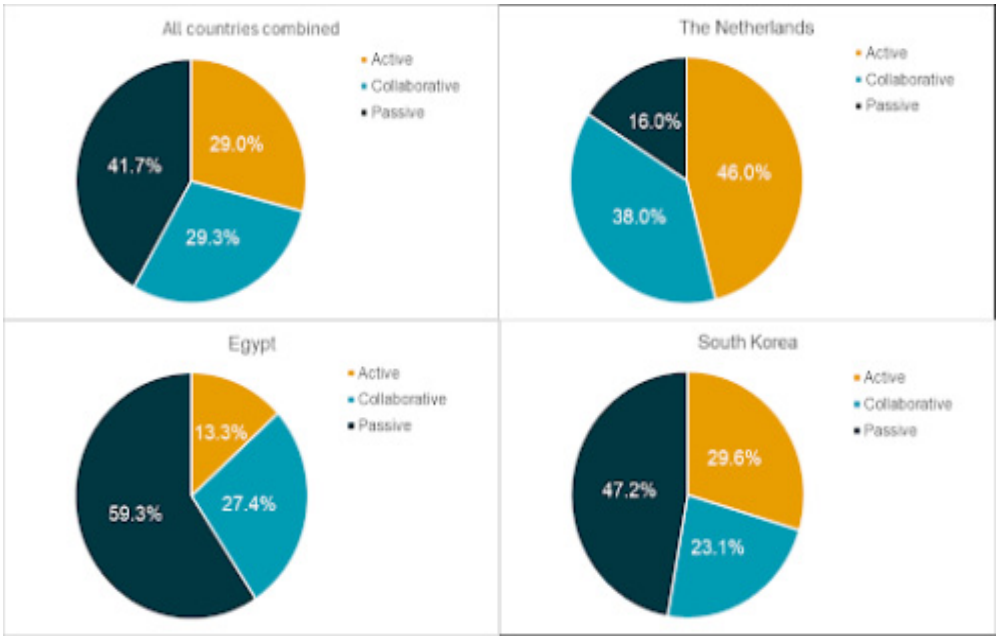
Introduction: Shared decision-making (SDM) is essential in managing non-segmental vitiligo, a condition with multiple preference-sensitive treatment options. However, evidence on patient experiences with SDM across cultural contexts is limited.

Methods, Results: This international cross-sectional survey included 321 adults with non-segmental vitiligo from the Netherlands, Egypt, and South Korea. Participants completed validated translated instruments, the 9-item shared decision making questionnaire (SDM-Q-9), the Decisional Conflict Scale (DCS), and the Control Preferences Scale (CPS). Statistical analyses were mainly descriptive in nature, presented as numbers (N) and/or proportions (%). Cross-country differences were analyzed using regression models adjusted for age and sex.

Patients reported a moderate level of SDM (median score SDM-Q-9: 66.67). South Korean participants experienced significantly higher SDM than Dutch patients, while Egyptian scores did not differ significantly. Overall, 58.3% of patients experienced decisional conflict about the choice of treatment , and 28% exceeded the threshold associated with decision delay. Role preferences varied: Dutch patients most often preferred an active role, while Egyptian and South Korean patients favoured passive roles. Most patients (77.3%) reported a need for a decision aid tool, especially in South Korea (92.6%).



Conclusion: This study provides the first cross-cultural assessment of SDM experiences in patients with non-segmental vitiligo across the Netherlands, Egypt, and South Korea. Patients in this study experience moderate SDM and substantial decisional conflict. Identifying preferred involvement, weighing the different treatment options together, and using decision aids may enhance patient-centred vitiligo care globally.

Learning Objectives:

After this presentation, participants will be able to:

1. Recognize the prevalence and impact of decisional conflict and varying role preferences in treatment choice.
2. Understand cross-cultural differences in shared decision-making experiences among patients with non-segmental vitiligo.
3. Appreciate the value of decision aids in promoting patient-centered vitiligo care

S09.08

Measuring Vitiligo in Clinical Practice: an International Consensus Study

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Introduction: Measuring outcomes in vitiligo in clinical practice is essential for disease management, yet no international consensus exists on which outcomes and measurement instruments should be used. This study aimed to prioritize outcome domains and initiate a consensus-based process to define a minimum set of outcomes and instruments for clinical practice.

Methods, Results: We followed the Harmonising Outcome Measures for Eczema (HOME) Clinical Roadmap, adapting the final consensus step to an eDelphi process. Dermatologists with expertise in vitiligo and patients were involved to capture both clinical and patient perspectives.

In step 1, the scope was defined, including paediatric and adult populations, segmental and non-segmental vitiligo, and both academic and non-academic settings. In step 2, outcome domains were prioritized through an international ranking survey based on domains from previous consensus initiatives, expert input, and a patient focus group.

A total of 43 participants (25 experts and 18 patients) from 20 countries completed the ranking survey. Repigmentation was identified as the highest-prioritized domain for assessment in clinical practice.

In step 3, candidate measurement instruments were identified based on systematic reviews evaluating measurement properties of clinician- and patient-reported outcome measures. These instruments form the basis for a structured two-round eDelphi process to establish consensus on recommended outcome measures.

Conclusion: Conclusion: This international consensus study addresses the lack of standardized outcome measurement in vitiligo clinical practice. The identification of prioritized outcome domains and candidate instruments provides a structured foundation for developing consensus-based recommendations for routine clinical use.

Learning Objectives:

Recognize the importance of standardized outcome measurement in clinical practice for patients with vitiligo.

S09.09

Patient-Reported Vitiligo Journey, Management, and Stigma in China: Findings from the National Health and Wellness Survey

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Introduction: People with vitiligo frequently experience psychosocial burden and significant quality-of-life impairment. The objective of this study was to estimate the prevalence of vitiligo in urban China and explore the vitiligo patient journey and disease burden.

Methods, Results: Data are from the 2025 National Health and Wellness Survey (NHWS), a population-based, self-reported cross-sectional online survey conducted by Oracle Life Sciences. Participants were adults (≥18 years) in urban China. Results were weighted to reflect demographic distributions of adults in urban China.

A total of 20 001 participants were included in this analysis (weighted: N=747.5M). Among these, 0.84% self-reported ever experiencing vitiligo and 0.53% self-reported clinically diagnosed with vitiligo. All measures presented are for respondents with self-reported clinically diagnosed vitiligo (**Table**; unweighted: n=104; weighted: n=3.9M). At time of survey, mean age was 52.3 years. Mean time since first diagnosis was 16.7 years and 69.3% reported mild disease at first diagnosis. On the PHQ-9 scale, 38.9% showed "Mild depression" and 24.2% "Moderate-to-severe depression" symptoms. Most participants reported experiencing stigma, including shame (84.1%), prejudice (90.8%), and discrimination (82.9%), because of their vitiligo. Facial involvement was reported by 48.5%, while 40% reported depigmentation of the hands, palms, or fingers. For those currently using a medical treatment for their vitiligo (39.3%), the most common reported were topical (78.0%) and oral (61.4%) treatments. Among those not currently receiving medical treatment/light therapy (40.9%), the top three reasons included "Treatment did not work" (46.3%), "No active vitiligo" (41.0%) and "Cost of treatment was too high" (26.5%).

Table. Characteristics of adults in China who self-reported clinically diagnosed vitiligo

	Diagnosed vitiligo population Weighted N=3.9 M
Demographic characteristics	
Mean age, years (SD)	52.3 (16.3)
Sex, female, %	40.0
Married, %	74.9
University degree or above, %	42.5
Employed, %	50.2
Clinical characteristics	
Current or former smoker, %	31.6
Overweight/obese (BMI ≥25), %	37.2
PHQ-9 Score, %	
0-4, "None-Minimal"	36.8
5-9, "Mild depression"	38.9
10-14, "Moderate depression"	18.0
15-19, "Moderately severe depression"	4.3
20-27, "Severe depression"	1.9

Vitiligo characteristics	
Diagnosing provider type, %	
Dermatologist	72.7
Immunologist	8.8
Other/Not reported	18.5
Mean (SD) time since first diagnosis, years	16.7 (13.2)
Mean (SD) age at first diagnosis, years	36.5 (18.4)
Self-reported severity of vitiligo at first diagnosis, %	
Mild	69.3
Moderate	14.0
Severe	2.9
Very severe	2.2
Don't know/Unknown/Not reported	11.6
S**elf-assessed severity of vitiligo at time of survey, %**	
Mild	75.0
Moderate	22.1
Severe	2.9
Perceived stigma, %	
Shame	84.1
Prejudice	90.8
Discrimination	82.9
Currently receiving vitiligo treatment, %	39.3
Topical treatments	78.0
Oral treatments	61.4
Injection in areas of skin color change	7.8
Injectable treatments	18.8
Other types of treatments	13.3
None of the above	2.0

BMI, body mass index; M, million; PHQ-9, Patient Health Questionnaire-9.

Conclusion: The prevalence of self-reported ever-experienced vitiligo in adults in China was 0.84% and self-reported clinically diagnosed with vitiligo was 0.53%, in alignment with previous literature. Most participants reported some level of embarrassment, judgement, and negative treatment from others because of their vitiligo. There is an unmet need for new, effective vitiligo treatments.

Learning Objectives:

1. Estimate the prevalence of vitiligo among adults in urban China
2. Understand the patient-reported vitiligo journey and stigma experienced by adults with self-reported clinically diagnosed vitiligo in urban China
3. Describe the vitiligo treatment patterns for adults with self-reported clinically diagnosed vitiligo in urban China

S09.10

Evaluation of Clinical and Dermoscopic Features of Vitiligo Stability with Correlation to Serum Level of CXCL10 in Vitiligo Patient

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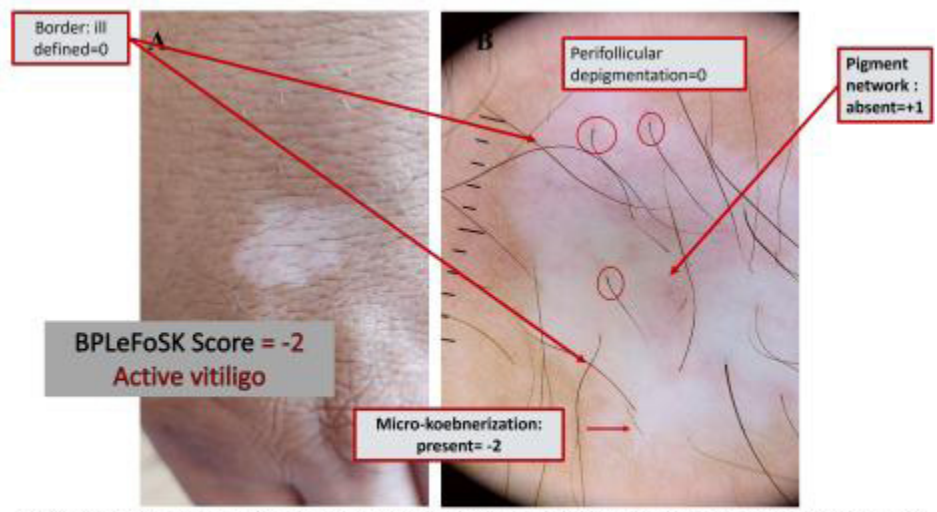
Introduction: Vitiligo is an acquired, pigmentary disease. There are two forms of vitiligo: active and stable. The interferon gamma inducible protein chemokine (C-X-C motif) ligand CXCL10, which binds to its receptor CXCR3 of T cells, leads to recruitment and skin homing of CD8+T cells, leading to destruction of melanocytes in active vitiligo [244]. This concept has prompted researchers to delve into molecular intricacies and study the role of this chemokine as an activity marker for vitiligo. Vitiligo is essentially a clinical diagnosis, but dermoscopy aids in differentiation between early vitiligo lesions and other simulating hypopigmentary disorders. Dermoscopy may aid in the evaluation of the vitiligo condition (stability, activity, repigmentation)

Methods, Results: Sixty patients with vitiligo were enrolled in this cross-sectional study. Patients were assessed using complete history taking, general examination, and VIDA score. Dermoscopic examination for vitiligo lesions using the BPLeFoSK score. Serum samples were obtained from all the participants to measure the serum level of CXCL10 by the enzyme-linked immunosorbent assay.

The current study identified that the most common dermoscopic findings in stable vitiligo patches included sharp borders, marginal and perifollicular pigmentation. In contrast, unstable vitiligo patches exhibited findings such as an ill-defined border, perifollicular depigmentation, microkoebner, and satellite lesions. **T**he BPLeFoSK criteria showed a significant negative correlation with the serum level of CXCL10 ($P < 0.001$), while the VIDA score demonstrated a significant positive correlation with it ($P < 0.001$).



(A): 41-year-old male with active vitiligo, the clinical picture of a vitiliginous lesion on the dorsum of hand. **(B):** dermoscopy showed: ill-defined border (black arrow), absent pigment network (star), absent perifollicular pigmentation (circle), and microkoebner (red arrow).

Conclusion: CXCL10 may be a reliable marker of vitiligo activity, as it demonstrated a significant rise in active versus stable cases. Dermoscopy helps to some extent, assess activity/stability to reach an appropriate treatment modality.

Learning Objectives:

To evaluate clinical and dermoscopic features in patients with active and stable vitiligo with possible correlation to serum level of CXCL10 as an activity marker of vitiligo.

Session 10 - Phototherapy & Case Reports

S10.02

308nm Excimer Lamp Combined Infrared Light Therapy Enhances Pigment Improvement of Vitiligo: a Retrospective Split-Body Comparative Study

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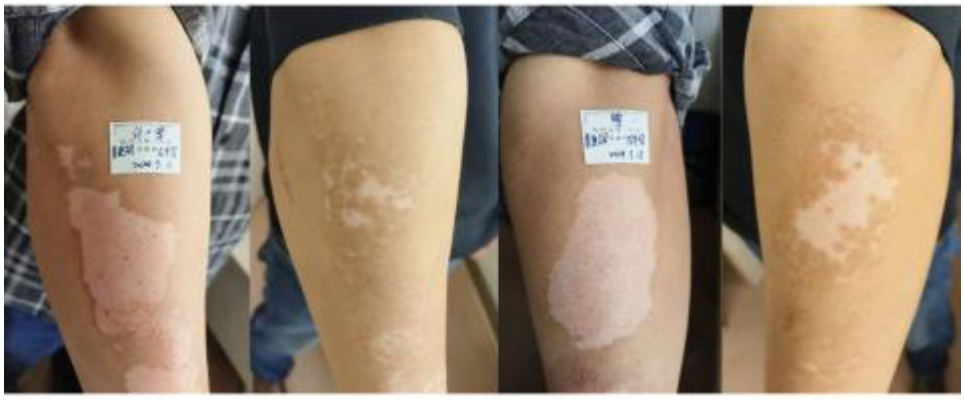
Introduction: Vitiligo is an autoimmune depigmenting disorder. 308nm excimer lamp is a treatment option. Infrared light could create favorable environment for melanocyte function, potentially synergizing with the effect of excimer lamp.

Methods, Results: We reviewed the medical records of nonsegmental vitiligo patients who attended the Department of Dermatology at Hangzhou Third People's Hospital between September 2024 and September 2025. Two counterpart depigmenting lesions were selected to either exposed to 308nm excimer lamp alone (308nm excimer group), or were exposed to 308nm excimer lamp combined with infrared light (infrared combined group). The pigment improvement of lesions was evaluated by local Body-Surface Area (BSA) and Vitiligo Area Scoring Index (VASI) at week 12 and week 24.

73 patients were included. At week 12, the average local BSA improvement of 308nm excimer group was 10.56±23.21%, and of infrared combined group was 15.87±22.95%. The average local VASI improvement of 308nm excimer group was 15.67±28.52%, and of infrared combined group was 24.45±27.98%. At week 24, the average local BSA improvement of 308nm excimer group was 14.45±24.71%, and of infrared combined group was 25.76±32.75%. The average local VASI improvement of 308nm excimer group was 23.88±30.07%, and of infrared combined group was 36.22±38.96%. There was a significant difference in local VASI from baseline to 12 weeks compared infrared combined group with 308nm excimer group (P=0.0370), and a significant difference in 50% improvement of local BSA from baseline to 24 weeks compared infrared combined group with 308nm excimer group (P=0.0107).



Conclusion: 308 nm excimer lamp combined infrared light therapy for vitiligo show a more rapid and robust pigment improvement process.

Learning Objectives:

308nm excimer lamp combined infrared light therapy enhances pigment improvement of vitiligo.

S10.04

Non-Invasive Multimodal Volumetric Imaging of Vitiligo with Subcellular Resolution

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Introduction: Vitiligo is a chronic skin disorder characterized by melanocyte loss and subsequent depigmentation, often imposing significant psychological burden on patients. Diagnosis, disease monitoring, and assess-

ment of treatment response currently rely primarily on visual clinical examination. While adjunct tools such as dermoscopy, Wood's lamp imaging, and digital photography provide additional information, they lack cellular-level resolution. In addition, longitudinal evaluation of vitiligo lesions by non-invasive methods is preferred compared to taking skin biopsies.

Case Report: We present a flexible multimodal skin imaging system that combines reflectance confocal, two-photon fluorescence, and second harmonic generation microscopy imaging to enable noninvasive, volumetric visualization of skin tissue with subcellular resolution and multi-contrast capability. The reflectance confocal image captures tissue scattering properties; two-photon fluorescence image reveals endogenous fluorophores such as NADH, melanin, and elastin; and second harmonic generation image highlights collagen structures within the dermis. This system enables acquisition of volumetric datasets (6 mm × 2.2 mm × 200 μm) within 10 minutes, allowing comprehensive imaging across the borders of depigmented lesions. It facilitates three-dimensional assessment of structural and biochemical transitions from normal to lesional skin, including changes in stratum corneum thickness, melanin distribution, epidermal cell morphology, the epidermal–dermal junction, and dermal collagen organization. This noninvasive optical biopsy approach offers a useful tool to explore the cellular changes occuring in vitiligo in real time and allows longitudinal monitoring of disease progression and therapeutic response at the same anatomical location.

Learning Objectives:

1. Learn a new multimodal volumetric imaging technique that can image the skin at subcellular resolution.
2. Understand the structural and biochemical changes of vitiligo skin, including changes in stratum corneum thickness, melanin distribution, epidermal cell morphology, the epidermal–dermal junction, and dermal collagen organization.

S10.05

Vitiligo: Challenging Cultural Assumptions and Shaping Identity

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Introduction: Vitiligo is a skin condition in which pigmentation stops developing, resulting in white patches on the body. It is often genetic, though it can affect anyone, and while medically harmless, it carries significant social and cultural implications. This study, conducted at the Annual World Vitiligo Conference in Detroit and online through Instagram and Facebook, used participant observation, interviews, and textual analysis to explore lived experiences. Three key themes emerged: feeling outcast, vitiligo as beautiful, and solidarity.

Findings show that cultural perceptions of visible difference strongly shape identity, suggesting vitiligo is both a medical and cultural condition. Participants emphasized the need for greater media representation to improve public understanding and everyday social interactions.

Case Report: Through participant observation, social media analysis, and interviews, three key themes emerged: feeling outcast, vitiligo as beauty, and solidarity, highlighting both the challenges and transformations in lived experiences.

Feeling Outcast: Participants described stigma, exclusion, and "othering," including being compared to animals, bullied, or treated as contagious. These experiences often began in childhood and continued into adulthood, leading to isolation, rejection in social and romantic settings, and internalized shame. Such experiences reflect broader processes of social stigma and constructed "difference."

Vitiligo as Beautiful: Despite stigma, many participants reframed vitiligo as unique and beautiful. While initial reactions often included grief and confusion, many eventually embraced their appearance as a form of self-expression. Acceptance was shaped by personal reflection and external validation, though experiences with the "gaze" and social scrutiny still influenced self-image. Over time, many integrated vitiligo into their identity as a meaningful and empowering feature.

Solidarity: A strong sense of community emerged through in-person events and online platforms. Shared experiences fostered quick emotional connections, support, and collective pride. Social media and support groups helped reduce isolation and allowed individuals to reclaim narratives around vitiligo, transforming stigma into empowerment.

Learning Objectives:

- Sociopsychological impacts of stigma, exclusion, and "otherness."
- Shifts from marginalization to empowerment, identity, and beauty.
- Community and solidarity through support networks that foster acceptance and resilience.

Poster Abstracts

P1: Artificial Intelligence in Vitiligo

P.01

Split-Face Comparison of Ruxolitinib versus Tacrolimus in Vitiligo Using Artificial Intelligence-Based Lesion Tracking

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Introduction: Vitiligo is the most common depigmenting skin disorder. As targeted therapies emerge, efficient and objective outcome measures are needed, since current assessments are time-consuming and subject to rater variability. Topical agents such as tacrolimus and ruxolitinib aim to restore pigmentation through immune modulation, though direct within-patient comparisons remain limited. We present a head-to-head comparison of ruxolitinib versus tacrolimus in facial vitiligo, alongside a novel point-of-care AI-based lesion measurement tool.

Case Report: A 49-year-old male with stable non-segmental facial vitiligo was enrolled in a split-face study, with topical ruxolitinib 1.5% cream applied to the right hemiface and tacrolimus 0.1% ointment to the left. A smartphone-based AI imaging application was used to trace lesions and generate automated area measurements (AI-Area) at baseline, week 12, and week 16. Photographs were also independently analyzed by a blinded assessor using open-source image analysis software to manually segment lesions, serving as the reference standard (Manual-Area). The primary outcome was percent change in depigmented lesion area at week 16; AI-manual measurement agreement was a secondary outcome. Written informed consent was obtained from the patient for publication.

At week 16, ruxolitinib demonstrated greater repigmentation, with approximately 1.5-fold greater reduction in lesion area compared to tacrolimus (68.8% vs. 45.9%). Across all timepoints and both hemifaces (6 measurement pairs), mean absolute difference between AI and manual area was 0.61 cm^2 (SD 0.64). AI-Area also accounted for intra-lesional peri-follicular repigmentation, reflecting subtle early changes beyond overall lesion size reduction. The patient reported greater satisfaction with the ruxolitinib-treated side, prompting transition to ruxolitinib on the full face after week 16.

This split-face case demonstrates superior repigmentation with ruxolitinib compared to tacrolimus, providing proof-of-concept for an AI-based lesion tracking as an objective, efficient tool for monitoring vitiligo. Larger studies are needed to validate both comparative efficacy and AI-driven outcome measurements.

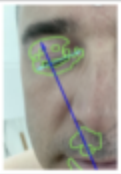
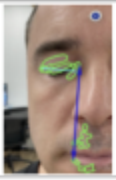
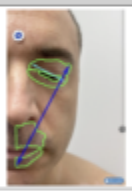
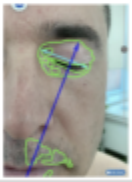
	Baseline (Week 0)	Week 12	Week 16
Right Face (treated with topical ruxolitinib)			
AI-Trace			
AI-Area (cm^2)	14.4	7.7	4.5
AI % Change from Baseline	—	-46.5%	**-68.8%**
Manual-Area (cm^2)	14.5	7.4	5.41
Manual % Change from Baseline	—	-48.96%	**-62.73%**
Difference between AI and Manual Area (cm^2)	-0.10	0.30	-0.91
Left Face (treated with topical tacrolimus)			
AI-Trace			
AI-Area (cm^2)	12.2	8.4	6.6
AI % Change from Baseline	—	-31.1%	**-45.9%**
Manual-Area (cm^2)	15.08	8.86	7.90
Manual % Change from Baseline	—	-41.25%	**-47.63%**
Difference between AI and Manual Area (cm^2)	-1.21	-0.46	-1.30

Figure 1. Changes in vitiligo depigmented lesion area over 16 weeks in a split-face study of topical ruxolitinib (right hemiface) and topical tacrolimus (left hemiface). Lesion area was measured as AI-Area, defined as lesion tracing performed on a smartphone application with automated area calculation (Swift Medical, Toronto, Ontario, Canada), and manual-area, defined as manual tracing using ImageJ software. Measurements are shown at baseline (week 0), week 12, and week 16. Beyond week 16, the patient transitioned to ruxolitinib on the entire face due to greater observed benefit.

Learning Objectives:

1. Compare the efficacy of topical ruxolitinib and tacrolimus for facial vitiligo using a split-face treatment approach.
2. Describe the application of an AI-based imaging tool to quantify vitiligo lesion area and monitor repigmentation over time.

P2: Assessment of Vitiligo Severity, Impact and Therapeutic Response

P.02

Work and Activity Impairment in Vitiligo Patients: a Multicenter Study

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Introduction: Vitiligo is a chronic autoimmune skin disorder characterized by the development of depigmented patches. While vitiligo often imposes a significant psychological burden and impairs patients' quality of life, there is limited research evaluating its impact on work productivity and daily activities. This study aimed to evaluate the impact of vitiligo on work productivity and daily activities using the Work Productivity and Activity Impairment (WPAI) questionnaire and to identify factors associated with greater impairment.

Methods, Results: This cross-sectional study was conducted in Korea between October 2023 and February 2025. Adult vitiligo patients (aged ≥20 years) who were currently employed were enrolled. multivariable logistic regression analyses were performed to identify factors associated with WPAI outcomes. Among 363 patients, the mean presenteeism was 16.64% ± 23.32, the mean absenteeism was 8.21% ± 22.58, the overall work productivity impairment was 23.52% ± 29.41 and the mean activity impairment was 21.27% ± 25.90. Based on multivari-

ate logistic regression analysis, a higher disease extent (VASI ≥ 1%) was significantly associated with increased presenteeism (aOR 2.042; 95% CI 1.266–3.294; p=0.003), absenteeism (aOR 2.377; 95% CI 1.358–4.161; p=0.002), and overall work impairment (aOR 2.683; 95% CI 1.631–4.412; p<0.001). Furthermore, the younger age group (20–39 years) showed a significantly higher risk for presenteeism (aOR 1.774; 95% CI 1.085–2.903; p=0.022) and overall work impairment (aOR 1.754; 95% CI 1.052–2.923; p=0.031) compared to the 40–59 age group. While not statistically significant, a trend toward higher impairment was observed in females, those with a disease duration of less than six months, and patients with lesions on exposed areas.

Conclusion: Vitiligo is associated with substantial impairment in both work productivity and daily activities. Younger age and extensive disease involvement contribute to greater work impairment. These findings emphasize the necessity of a comprehensive management approach that addresses the occupational and social functioning of patients.

Learning Objectives:

- Evaluate the impact of vitiligo on work productivity and daily activities using WPAI measures.
- Identify clinical and demographic factors associated with greater functional impairment in patients with vitiligo.

P.03

Relapse of Vitiligo: a Systematic Review and Meta-analysis of Terminology, Definitions, Reported Rates, and Predictors

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Introduction: Relapse is a clinically important outcome in vitiligo, but heterogeneous terminology, inconsistent index dates, variable follow-up durations, and the absence of standardized outcome reporting hinder interpretation across studies. We aimed to characterize the terminology and definitions of relapse, estimate its pooled incidence, and identify risk factors.

Methods, Results: A systematic literature search was conducted in PubMed and the Cochrane Library from inception through March 2026. Studies were eligible if they reported quantitative relapse data following any vitiligo treatment in patients with a minimum follow-up for three months. Data on relapse terminology, operational definitions, index dates, incidence, and risk factors were extracted. Relapse rate was pooled using random-effects models with logit transformation.

Among 276 records identified, 38 studies were included in the systematic review, and 33 studies comprising 5,696 participants were included in the meta-analysis. Terminology was inconsistent across studies: 20 used "recurrence", 13 used "relapse", and 5 used both terms. Treatment cessation was the most common index date. The pooled relapse rate was 18.5% (95% CI, 15.1–22.3; I^2;=74.8%) at the study level and 17.7% (95% CI, 14.9–20.9; ^{2}=76.2%) at the intervention arm level. Relapse rates increased from 16.2% (95% CI, 12.2–21.3) at 6 months to 21.1% (95% CI, 14.5–29.6) at 12 months. In subgroup analyses, arms with maintenance therapy showed a lower relapse rate than those without maintenance (16.4% vs 23.5%, p=0.15). Reported risk factors of relapse included active disease, greater disease extent, longer disease duration or treatment delay, acral or nonfacial involvement, younger age of onset, and autoimmune comorbidity.

Conclusion: Relapse of vitiligo affected approximately one in five patients overall and increased with longer follow-up. These findings underscore the need for standardized terminology, explicit index dates, and prospective long-term studies to better define relapse patterns and clarify the role of maintenance strategies.

Learning Objectives:

1. Define and distinguish the terminology and operational definitions used for vitiligo relapse across clinical studies.
2. Summarize the pooled incidence of vitiligo relapse and explain how relapse rates vary according to follow-up duration, treatment category, vitiligo type, and maintenance therapy status.
3. Identify the major clinical risk factors associated with vitiligo relapse and discuss the need for standardized outcome reporting in future research.

P.04

Real-World Psychosocial Burden, Quality of Life, and Disease Management of Non-Segmental Vitiligo in the United States

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Introduction: Non-segmental vitiligo (NSV) can impact psychosocial health, daily activity, and quality of life (QOL). This cross-sectional study aimed to quantify NSV burden in US adults and examine how clinical presentation may contribute to heterogeneity in QOL outcomes.

Methods, Results: Patients with diagnosed NSV were referred by physicians to complete a survey (May-October 2025). Data collected included demographics, clinical characteristics, and outcome measures: Self-Assessment Vitiligo Extent Score (measures % body surface area [BSA] affected), Dermatology Life Quality Index (DLQI; range 0–30, higher scores indicate greater impact), Vitiligo Impact Patient Scale (VIPs; range 1–95, higher scores indicate greater impact), and Patient Global Impression of Severity. Variables were stratified by BSA, disease duration, and affected body region.

Among 200 respondents, mean age was 48.2 years, 64% were female, and 42% had been diagnosed in the last 5 years. At survey completion, 48% were using corticosteroids, 27% a topical JAK inhibitor, and 9% had received no treatment. Lesions were reported on the face (34%), head/neck (47%), hands (44%), upper extremities (62%), genitalia/groins (16%), torso (55%), and lower extremities (55%). Mean DLQI score was 4.8. Mean VIPs score was 25.2. 42% of patients indicated ≥moderate facial severity, and 38% ≥moderate total body severity. Table 1 shows DLQI, VIPs, and face/body severity stratified by BSA, disease duration, and affected body region. Disease burden varied across subgroups, with numerically higher mean DLQI scores among those with shorter disease duration and head/neck involvement. Mean VIPs scores did not vary substantially across disease duration or body region. Both measures suggested non-linear relationships between QOL impacts and affected BSA. DLQI trended higher with greater severity on the face and body.

	Total Sample	Duration of Disease (years)			Affected Body Region							% BSA Affected					
		≤5	6 to 10	>10	Face	Rest of head and neck	Hands	Rest of upper extremities	Genitalia/ Groin	Torso	Lower extremities	0-1%	2-5%	6-10%	11-25%	26-50%	>50%
DLQI Score[a]																	
Total N	200	84	45	73	67	93	80	124	32	109	118	78	77	15	14	12	4
Mean	4.8	5.8	5.8	3.8	4.4	5.7	4.6	5.2	4.0	5.0	4.9	3.0	6.0	6.2	7.2	4.2	2.5
SD	4.72	5.16	5.69	3.20	5.06	4.53	4.84	4.94	4.19	4.82	5.18	3.47	4.68	5.47	7.65	3.66	2.38
VIPS Score[b]																	
Total N	200	84	45	73	67	93	80	124	32	109	118	78	77	15	14	12	4
Mean	25.2	23.9	26.4	25.9	25.4	21.2	26.1	28.1	27.8	27.2	27.8	17.0	27.8	27.7	40.2	31.4	50.5
SD	21.83	19.80	24.88	22.27	23.92	22.15	23.49	22.21	26.25	23.35	23.17	16.85	20.83	18.16	31.58	26.88	32.48
Severity on the Face[c]																	
Total N (%)	67	27	15	25	67	27	32	39	21	36	36	25	24	4	4	6	4
None	4 (6)	1 (3.7)	1 (6.7)	2 (8)	4 (6)	1 (3.7)	2 (6.2)	1 (2.6)	1 (4.8)	1 (2.8)	2 (5.6)	1 (4)	2 (8.3)	-	-	-	1 (25)
Mild	35 (52.2)	15 (55.6)	6 (40)	14 (56)	35 (52.2)	13 (48.1)	15 (46.9)	22 (56.4)	12 (61.9)	16 (38.9)	20 (55.6)	20 (80)	9 (37.5)	2 (50)	3 (75)	3 (36.7)	-
Moderate	23 (34.3)	9 (33.3)	7 (46.7)	7 (28)	23 (34.3)	9 (33.3)	13 (37.5)	11 (28.2)	6 (19)	16 (44.4)	11 (30.6)	4 (16)	12 (50)	1 (25)	1 (25)	5 (83.3)	-
Severe	5 (6)	2 (7.4)	1 (6.7)	1 (4)	4 (6)	3 (11.1)	2 (6.2)	4 (10.3)	2 (9.5)	4 (11.1)	2 (5.6)	-	1 (4.2)	1 (25)	-	-	2 (50)
Very severe	1 (1.5)	-	-	1 (4)	1 (1.5)	1 (3.7)	1 (3.1)	1 (2.6)	1 (4.8)	1 (2.8)	1 (2.8)	-	-	-	-	-	1 (25)
Severity on the Total Body[d]																	
Total N (%)	200	84	45	73	67	93	80	124	32	109	118	78	77	15	14	12	4
None	18 (9)	6 (7.1)	4 (9.1)	8 (11)	6 (9)	4 (4.3)	9 (10.2)	6 (4.8)	1 (3.1)	5 (4.6)	9 (8.2)	8 (10.3)	5 (6.5)	2 (13.3)	1 (7.1)	1 (8.3)	1 (25)
Mild	107 (53.5)	57 (67.9)	17 (39.5)	33 (45.2)	31 (46.3)	40 (43)	41 (46.6)	61 (49.2)	11 (34.4)	58 (53.5)	55 (50)	61 (78.2)	38 (46.8)	4 (26.7)	2 (14.3)	4 (33.3)	-
Moderate	67 (33.5)	19 (22.6)	21 (46.8)	27 (37)	28 (55.8)	44 (47.3)	32 (36.4)	49 (39.5)	15 (46.9)	45 (39.4)	39 (35.5)	9 (11.5)	34 (44.2)	8 (53.3)	11 (78.6)	5 (41.7)	-
Severe	8 (2)	2 (2.4)	-	2 (2.7)	2 (3)	5 (5.3)	2 (2.3)	4 (3.2)	5 (3.1)	3 (2.8)	3 (2.7)	-	2 (2.6)	1 (6.7)	-	1 (8.3)	-
Very severe	8 (2)	-	1 (2.3)	3 (4.3)	4 (6)	4 (4.3)	4 (4.5)	4 (3.2)	8 (12.5)	4 (3.7)	8 (3.6)	-	-	-	-	1 (8.3)	3 (75)

BSA = body surface area; DLQI = Dermatology Life Quality Index; SD = standard deviation; VIPS = Vitiligo Impact Patient Scale.
[a]Score ranges from 0 to 30 with a higher score indicating greater impact on quality of life. Scores ranging from 0 to 1 correspond to no effect, 2 to 5 a small effect, 6 to 10 a moderate effect, and 11 to 30 a very large/extremely large effect on the respondent's life.
[b]Score ranges from 0 to 95 with a higher score indicating greater impact due to vitiligo.
[c]Self-assessed severity of vitiligo on the face only at the time of the survey.
[d]Self-assessed severity of vitiligo on the body (including the face) at the time of the survey.

Conclusion: Adults with NSV reported substantial psychosocial burden and QOL impacts. QOL varied across subgroups and measurement instruments, suggesting multiple factors impact burden severity across a wide variety of QOL dimensions.

Learning Objectives:

1. Describe how BSA, duration of disease, and affected body region impact QOL in adults with NSV
2. Understand the relationship between face and total body severity and QOL outcome (DLQI) in adults with NSV
3. Describe how QOL impacts vary by measurement instrument (DLQI and VIPs) in patients with NSV

P.05

Monitoring Facial Vitiligo Treatment with High-Resolution Noninvasive Skin Imaging

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Introduction: Vitiligo is a chronic depigmenting disorder characterized by melanocyte loss and variable disease progression. Topical ruxolitinib, a selective Janus kinase 1/2 inhibitor, is the first targeted therapy approved for non-segmental vitiligo with facial involvement. However, clinical repigmentation often occurs after a delay, making early treatment monitoring challenging. Non-invasive imaging techniques may detect subclinical changes that precede visible repigmentation.

Methods, Results: This prospective pilot observational study included adult patients with stable facial non-segmental vitiligo treated with topical ruxolitinib cream 15 mg/g twice daily. Dermoscopy and line-field confocal optical coherence tomography imaging were performed on one lesional facial area and a matched non-lesional control area at baseline, and on lesional skin after six months of treatment. Predefined dermoscopic and imaging features were recorded as present or absent and analyzed at the cohort level. Clinical outcomes were evaluated using the Facial Vitiligo Area Severity Index (f-VASI) and the Vitiligo Noticeability Scale (VNS).

Ten patients completed the study. At baseline, lesional skin showed reduced perifollicular pigmentation and fewer pigmented basal keratinocytes compared with non-lesional skin, together with a higher prevalence of dermo–epidermal junction blurring. After six months of treatment, imaging revealed increased perifollicular pigmentation and a higher frequency of pigmented basal keratinocytes, accompanied by partial restoration of dermo–epidermal junction architecture. These findings were associated with significant clinical improvement, reflected by increased VNS scores and reduced f-VASI values.

Conclusion: The combined use of dermoscopy and line-field confocal optical coherence tomography allows objective visualization of pigmentary and microstructural changes during topical ruxolitinib treatment. This multimodal non-invasive approach may complement clinical evaluation and support earlier assessment of therapeutic response in facial vitiligo.

Learning Objectives:

1. Identify dermoscopic and microstructural features associated with facial non-segmental vitiligo.
2. Describe how dermoscopy and line-field confocal optical coherence tomography can be used for non-invasive monitoring of treatment response.
3. Recognize early imaging markers associated with repigmentation during topical ruxolitinib therapy.

P.06

Validity and Feasibility of the Distress Thermometer for Assessing Vitiligo-Related Distress

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Introduction: Assessing quality of life in vitiligo is essential, yet existing questionnaires are often too time-consuming for routine clinical use. This study evaluated the validity and feasibility of the newly developed Distress Thermometer with recall periods of 1 week and 1 month (table, DT) as a rapid screening tool for vitiligo-related distress in a Dutch clinical setting.

Methods, Results: Adults with non-segmental vitiligo were recruited from our department. Content validity was assessed by interviews with patients and physicians. Construct validity was tested using four predefined hypotheses with Spearman correlations against, among others, the Dermatology Life Quality Index (DLQI) and the Vitiligo-specific Quality of Life instrument (VitiQoL). Feasibility was assessed by measuring completion time and perceived ease of use. The DT was considered feasible if completed within one minute and rated "easy" or "very easy" by ≥75% of participants.

For content validity and feasibility 20 patients and for construct validity 35 patients were included (mean age 48y, 54% female, median TVASI=4.8). Patients confirmed that the DT reflected emotional, social, and physical distress, preferring a single-item format and 1-week recall, though 1-month recall was also evaluated. Strong positive correlations were observed with the DLQI (ρ=0.85 for 1-week; ρ=0.74 for 1-month) and the VitiQoL (ρ=0.87 for 1-week; ρ=0.84 for 1-month), confirming construct validity. On average, patients with active disease scored >1 point higher than those without recent activity. Median completion time was 14 seconds (range 12–25), and 85% rated the DT as "easy" or "very easy.

The distress thermometer (recall period of 1 week and 1 month)

Stage	Question formulation (English translation)
1-week recall period	How much distress have you experienced due to your vitiligo over the past week? (Includi ng emotional, social, and, if applicable, physical aspects). From 0 = no distress at all to 10 = extreme distress.
1-month recall period	How much distress have you experienced due to your vitiligo over the past month? (Including emotional, social, and, if applicable, physical aspects). From 0 = no distress at all to 10 = extreme distress.

Conclusion: The Distress Thermometer demonstrated strong validity, indicating that it appropriately captures vitiligo-related distress. Its short completion time and high ease-of-use ratings suggest that it is feasible for rou-

tine implementation in dermatology practice. These findings support the potential of the Distress Thermometer as a rapid screening tool to identify vitiligo related quality of life.

Learning Objectives:

1. Understand how the Distress Thermometer serves as a valid and efficient tool for assessing vitiligo-related distress.
2. Recognize the feasibility and ease of integrating the Distress Thermometer into routine dermatology practice.

P.07

Development and Validation of an Arabic Vitiligo Impact Patient Scale Short Form Version

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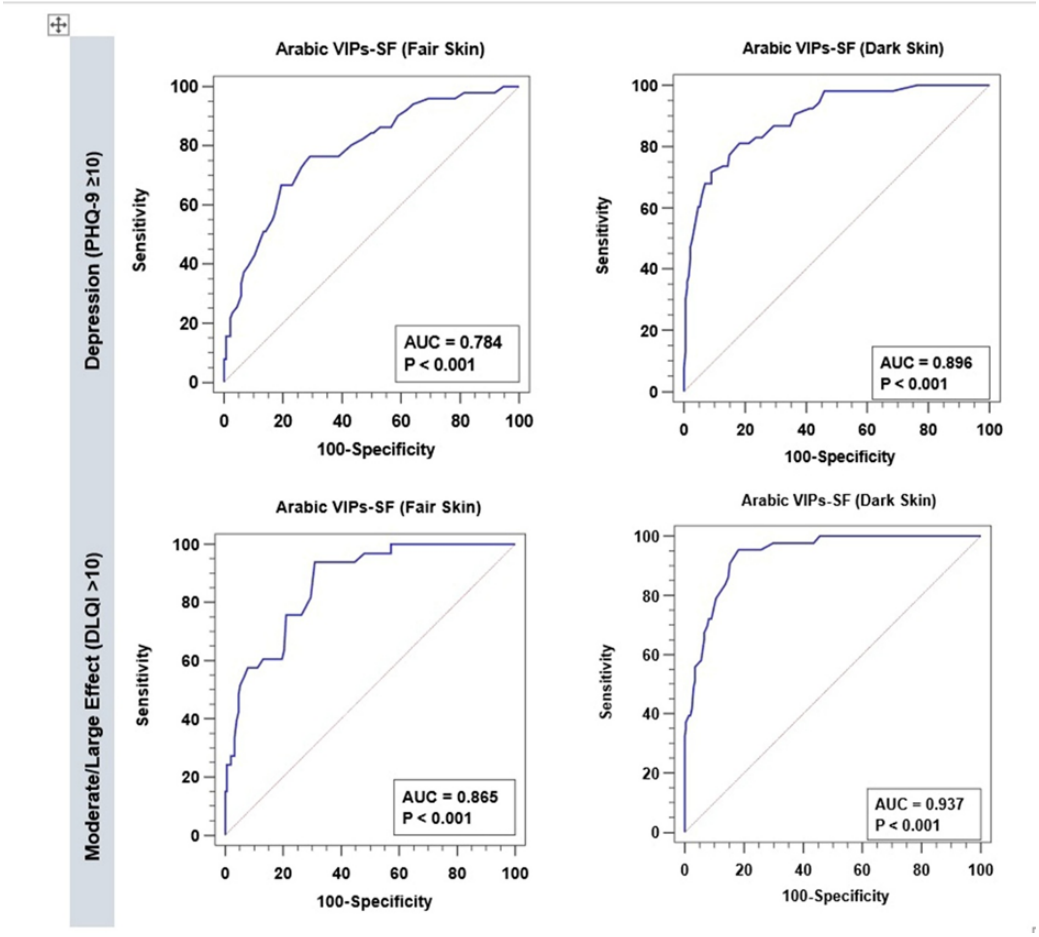
Introduction: Vitiligo is a common depigmenting skin disease that is frequently associated with psychological stresses. Patients usually experience embarrassment and low self-esteem. There are few tools evaluating vitiligo patients' quality of life. A vitiligo impact patient scale short form (VIPs-SF) was developed in English.

Methods, Results: This cross-sectional study included 425 vitiligo patients. The VIPs-SF was translated into Arabic and was self-administered to patients according to their skin-phototype. Patients also filled the AR-Dermatology life quality index (DLQI) and the Patient Health Questionnaire for depression (PHQ-9). AR-VIPs-SF reliability, dimensional structure, and construct validity were assessed.

Both fair skin and dark skin AR-VIPs-SF had an excellent internal consistency (Cronbach's alpha:0.92 and 0.91) and a good test-retest reliability (ICC:0.82 and 0.81). Confirmatory factor analysis demonstrated acceptable fit based on CFI/TLI/SRMR values, although chi-square was significant, as expected with large sample size. There were significant positive correlations between AR-VIPs-SF total scores and either PHQ-9 or DLQI scores ($p<0.001$). Fair skin, married patients, upper limb involvement, higher DLQI and PHQ9 scores were associated with higher VIPs-SF total score**.**



Receiver Operating Characteristic (ROC) curve of Arabic VIPs-SF for Depression and Moderate-to-Large Effect on Patient's Life (Fair Skin subsample = 185, Dark skin subsample =240).

Conclusion: Arabic VIPs-SF proved valid and reliable.

Learning Objectives:

This study aims to develop a valid and reliable Arabic (AR) VIPs-SF version.

P3: Basic Science

P.08

Assessment of Vitiligo Activity before and after Alexandrite and Nd;YAG Laser Assisted Hair Removal in Patients with Stable Non Segmental Vitiligo

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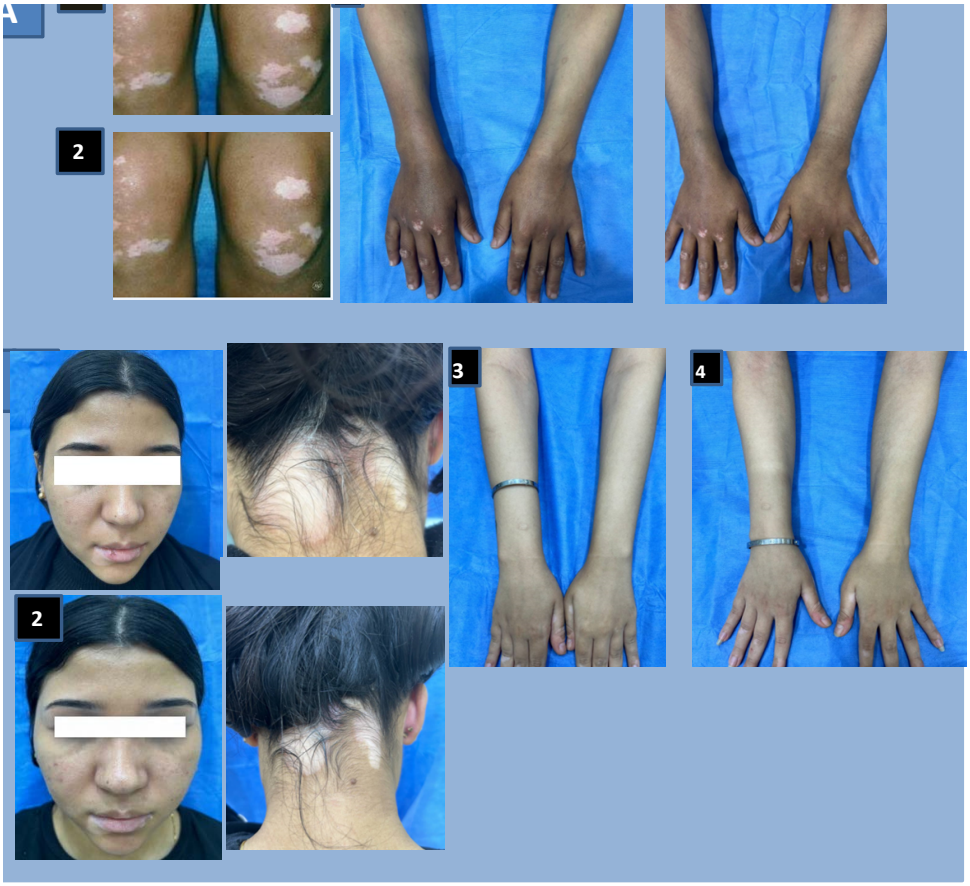
Introduction: Currently, there is a lack of clear evidence-based guidelines on the safety of laser hair removal (LHR) in vitiligo patients. Although it represents as important cosmetic demand, there is ongoing concern that

laser-induced thermal energy may trigger kobnerizatin or new lesion. CXCL9 and CXCL10 are approved markers of vitiligo activity.

Methods, Results: This randomized clinical trial included 30 patients with stable non segmental vitiligo and 30 matched healthy controls. Vitiligo severity and activity were assessed via vitiligo area scoring index (VASI) and Vitiligo disease activity score (VIDA), respectively. Patients underwent 4 sessions of Alexandrite (Alex) or Neodymium-doped Yttrium Aluminum Garnet (Nd:YAG) laser according to patient's skin phototype. Serum level of CXCL9 and CXCL10 were measured pre and post sessions by enzyme linked immunosorbent assay (ELISA) and compared to control group.

Results: After LHR either by Nd:YAG or Alex, none of vitiligo patients developed new lesions or showed increase in vitiligo lesions area. Regarding Alex group, post sessions VASI score, CXCL9 and CXCL10 serum levels were significantly lower than the pre sessions values. Mean VASI score was (1.99 ± 2.65 vs 2.50 ± 3.16 respectively) with p value of (0.002). CXCL9 (187.1 ± 62.44 vs 246.9 ± 67.68, respectively) with p value of (0.013). CXCL10 (37.60 ± 14.72 vs 45.19 ± 11.90, respectively) with p value of (0.005).

Regarding Nd:YAG group, post sessions VASI score, CXCL9 and CXCL10 serum levels were significantly lower than the pre sessions values. Mean VASI score (2.17 ± 2.56 vs 2.64 ±3.20, respectively) with p value of (0.005). CXCL9 (158.3 ± 43.27 vs 203.7 ± 78.76, respectively) with p value of (0.036). CXCL10 (40.99 ± 20.97 vs 47.68±21.78, respectively) with p value of (0.003).



Clinical outcome of laser assisted hair removal in patients with stable non segmental vitiligo.

(1) untreated area pre sessions (2) post 4th session. (3) Both forearms (treated area) pre session (4) post 4th session.

Conclusion: LHR either by Nd:YAG or Alex laser was safe in vitiligo patients without increasing the area of extent or triggering new lesions.

Learning Objectives:

1. To detect if LHR carry the risk of increasing Vitiligo activity clinically

2. To comapre serum level of CXCL9 and CXCL10 in vitiligo patients and cotrols
3. To find out if there is difference between serum level of CXCL9 and CXCL10 before and after LHR sessions

P.09

From Stress to Cytotoxicity: an Integrative Psychoneuroimmune Model of Vitiligo Pathogenesis

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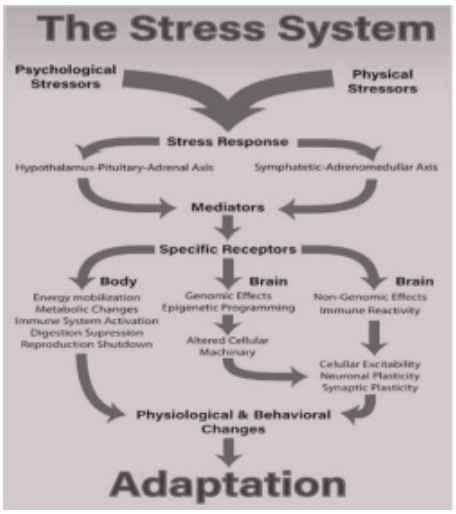
Introduction: Psychological stress is frequently reported prior to vitiligo onset and disease reactivation. However, the biological mechanisms linking stress exposure to melanocyte destruction remain incompletely defined. This review proposes an integrative psychoneuroimmune model explaining how stress-related pathways contribute to cytotoxic autoimmunity in vitiligo.

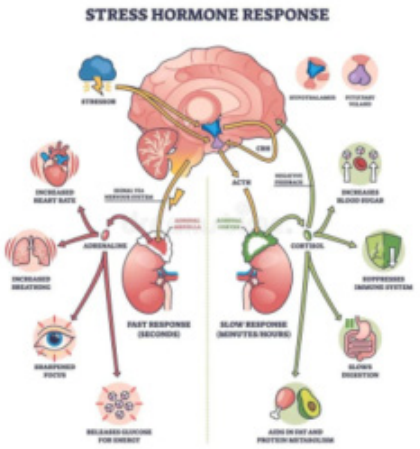
Methods, Results: A narrative review of the literature was conducted using current evidence from studies addressing the neuroendocrine, oxidative, and immunological mechanisms involved in vitiligo pathogenesis. Relevant literature on hypothalamic–pituitary–adrenal (HPA) axis activation, oxidative stress, melanocyte damage, and cytotoxic immune pathways was reviewed and integrated to construct a mechanistic psychoneuroimmune model of disease progression.

Acute stress induces cortisol release, transiently suppressing Th1-mediated immunity but incompletely inhibiting Th17 responses and CD8+ cytotoxic T-cell activity, which are central drivers of melanocyte destruction. Chronic stress promotes glucocorticoid receptor downregulation, leading to functional cortisol resistance and persistent production of proinflammatory cytokines including interferon-γ and CXCL10.

Simultaneously, stress enhances systemic oxidative burden, increasing reactive oxygen species and hydrogen peroxide accumulation in melanocytes. Oxidatively damaged melanocytes release danger-associated molecular patterns such as HSP70 and HMGB1, activating dendritic cells and amplifying adaptive cytotoxic responses. The cutaneous melanocortin system, functioning as a peripheral stress-response axis, further links neuroendocrine signaling with pigmentation control and immune modulation.

This integrative framework demonstrates that stress does not simply suppress immunity, but may selectively permit or amplify pathogenic cytotoxic pathways relevant to vitiligo.





Conclusion: Vitiligo may represent a convergence of stress-induced neuroendocrine signaling, oxidative melanocyte injury, and cytotoxic immune activation. Understanding this interconnected network identifies potential therapeutic targets including modulation of cortisol signaling, oxidative stress reduction, and immune pathway inhibition.

Key References:

Faraj et al., 2022; Frisoli et al., 2020; Rodrigues et al., 2017; Rashighi & Harris, 2015; Wang et al., 2016; Speeckaert et al., 2018; Slominski et al., 2013.

Learning Objectives:

1. The impact of stress on nervous, endocrine and immune systems. Also enhances systemic oxidative burden.
2. The impact of these changes on a cellular level in the pathogenesis of vitiligo & how to break the cycle.
3. A better understanding of melanocortin system.

P.10

Why is Segmental Vitiligo Different from Non-Segmental Vitiligo? How Can We Use This to Make Treatments Better for Segmental Vitiligo

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Introduction: Segmental vitiligo (SV) is a distinct subtype of vitiligo characterized by unilateral depigmentation confined to 1 or more skin segments, onset typically occurring in the first two decades of life. SV is infrequently associated with systemic autoimmune comorbidities- thyroid peroxidase antibody positivity is approximately half as common in SV compared to NSV- yet mounting histopathological and immunological evidence confirms that an active immune-mediated process is central to its pathogenesis. Lesional skin in progressive SV demonstrates CD8+ cytotoxic T-cell infiltration migrating toward the basal layer, with flow cytometry confirming the anti-melanocyte specificity of these cells, and inflammatory features have been documented histologically in up to 78% of SV patients.

Methods, Results: The unique segmental distribution of SV lesions doesn't align with classic dermatomal territories but closely parallels the distribution patterns of conditions driven by somatic mosaicism, including segmental lentiginosis, lichen striatus, blaschkitis, and linear morphea- all of which share a young age of onset, a self-limited inflammatory course, and a localized immune reaction against genetically distinct cells. The embryological migration of melanoblast precursors from the neural crest along dorsolateral pathways provides a plausible biological substrate for somatic mutations arising during this period, creating a clonally distinct population of melanocytes that subsequently becomes a target for CD8+ T-cell-mediated destruction.

Conclusion: The converging lines of clinical, histopathological, & molecular evidence support hypothesis that SV arises from a localized autoimmune reaction selectively targeting epidermal melanocytes carrying somatic mosaic mutations, positioning SV within a broader category of immune-mediated mosaic skin disorders. This explains why segmental vitiligo may respond better to therapeutic wounding techniques like Vitiligo Surgery, Microneedling, Needling, along with other immune mediated topical treatments. A combination of these techniques may be the best way to treat SV from the beginning. This offers a compelling framework to guide future genetic and therapeutic research in pigmentary disease.

Learning Objectives:

Segmental Vitiligo is distinct based on Mosaicism / Autoimmunity as a Converging Evidence for a Localized Immune Response Against Genetically Distinct Melanocyte- These above mechanisms may be used to guide treatments includng a combination approach with predominence for therapeutic wounding pathway and melanocyte trasfer methods, from the initial visit, for better and early treatment success

P.11

Mannose-Binding Lectin Gene Polymorphism in Vitiligo: an Observational Study and Computational Analysis

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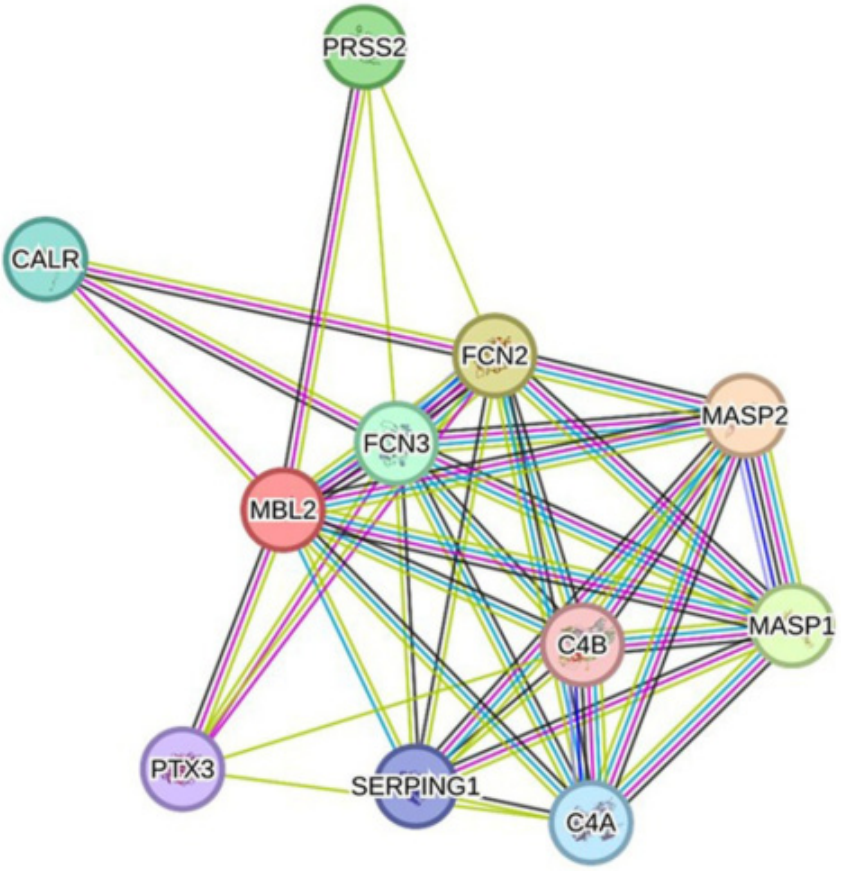
Introduction: vitiligo is an inflammatory autoimmune skin disorder with remarkable genetic involvement. Mannose-binding lectin (MBL) represents a significant immune molecule with one of its gene variants strongly linked to autoimmune diseases. Therefore, in this study, we investigated the role of the MBL variant, rs1800450, in vitiligo disease susceptibility.

Methods, Results: The study comprised performing *in silico* analysis, performing an observational study regarding vitiligo patients. Various *in silico* tools were used to investigate the impact of the selected mutation

on the function, stability, post-translational modifications (PTMs), and secondary structures of the protein. In addition, a total of 390 subjects were enrolled in this study, including their demographic and clinicopathological data. Genotyping analysis was performed using real-time PCR for the single nucleotide polymorphism (SNP) rs1800450 on codon 54 of the MBL gene, utilizing TaqMan genotyping technology. In addition, implications of the studied variant on disease susceptibility and various clinicopathological data were analyzed.

Results: Computational analysis demonstrated the anticipated effects of the mutation on MBL protein. Furthermore, regarding the observational studies, rs1800450 SNP on codon 54 displayed comparable results in our population relative to global frequencies reported via the 1,000 Genomes Project. The MBL protein–protein interaction network was generated as shown in the attached figure, and the 10 most interactive proteins were predictedThis SNP showed no significant association with vitiligo disease risk in all genetic association models. Furthermore, rs1800450 SNP did not significantly correlate with any of the demographic or clinicopathological features of vitiligo.



Conclusion: Our findings highlighted that the rs1800450 SNP on the *MBL2* gene has no role in the disease susceptibility to autoimmune skin diseases, such as vitiligo. In addition, our analysis advocated the notion of the redundancy of MBL and revealed the lack of significant impact on vitiligo disorder.

Learning Objectives:

To investigate the role of the MBL variant, rs1800450, in vitiligo disease susceptibility and various clinicopathological data.

P4: Case Reports

P.12

Reticulate Acropigmentation of Dohi (Dyschromatosis Symmetrica Heraditaria): a Report of Two Cases

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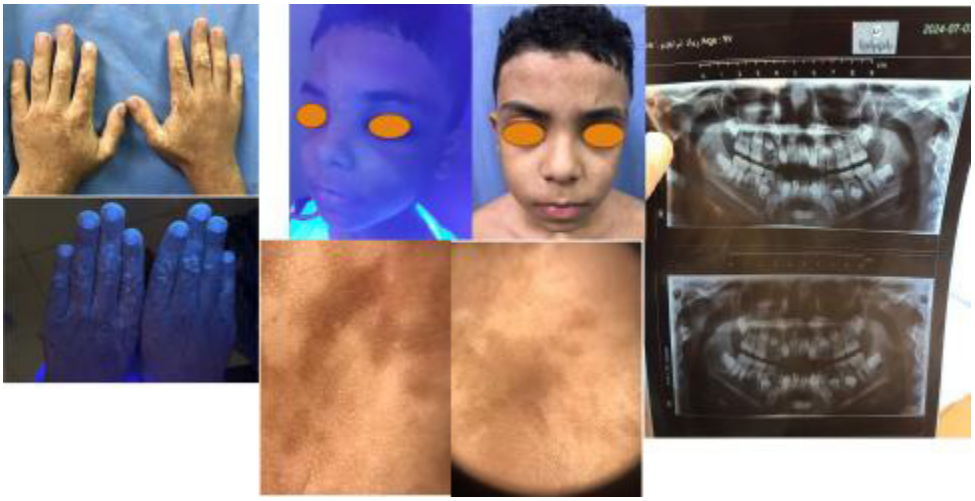
Introduction: Reticulate acropigmentation of Dohi, also called dyschromatosis symmetrica hereditaria or symmetrical dyschromatosis of the extremities, is an autosomal dominant inherited disorder. It is characterized by mottled pigmentation with patchy depigmentation commonly over the back of the hands and feet, and sometimes on the arms and legs. Those cases are sometimes misdiagnosed as vitiligo.

Case Report: Two cases of reticulate acropigmentation. The first case was 9 years old child presented with multiple hypo and hyperpigmented macules on the wrist, dorsum of hands and feet 7 years ago, which gave blue, white accentuation by wood's light. He has pigmentary demarcation lines separating his upper and lower face. He has dental anomalies in the form of overcrowded teeth. He was diagnosed with vitiligo and received different courses of topical, systemic, and phototherapy treatments with no improvement. His 2-year-old younger brother has mild dyspigmentation of the dorsa of his hands. Dermoscopic examination showed typical features of reticulate acropigmentation of Dohi (Dyschromatosis Symmetrica Hereditaria).

The second case was 32 years old male presented with multiple hypo and hyperpigmented macules on the dorsa of hands and feet. He was previously treated as vitiligo for a long time. The condition had been present since infancy, and the dermoscopic features were typical.



Learning Objectives:

To differentiate Reticulate acropigmentation of Dohi from acral vitiligo and other causes of reticulate acropigmentation.

P.13

Long-term Follow-up Analysis of 62 Cases of Hypopigmented Mycosis Fungoides

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Introduction: To analyze the clinical manifestations, dermoscopy, reflectance confocal microscopy, histopathology features, treatment and follow-up data of hypopigmented mycosis fungoides.

Case Report: A retrospective analysis was conducted on the clinical manifestations, dermoscopic and reflectance confocal microscopy (RCM) features, histopathological characteristics, and long-term treatment follow-up data of patients with pathologically confirmed hypopigmented mycosis fungoides who were treated in the Department of Dermatology, Hangzhou Third People's Hospital from October 2015 to October 2025.

A total of 62 patients with hypopigmented mycosis fungoides were enrolled, including 38 males and 24 females, with a male-to-female ratio of 1:0.63. The age ranged from 4 to 55 years, with an average age of 20.29 ± 13.59 years. Children under 12 years old accounted for 51.61%, and minors under 18 years old accounted for 69.36%. Hypopigmented macules were commonly distributed on the extremities, trunk, buttocks, face and neck. Dermoscopy manifestations included hypopigmented macules without perifollicular pigment residual and spermatozoa-like vessels. Reflectance confocal microscopy showed mild hypopigmentation in the basal layer and detection of Pautrier microabscesses in the epidermis. Pathological features included focal vacuolar degeneration of basal cells, focal lymphocyte exocytosis into the epidermis, and some cells with large, hyperchromatic and atypical nuclei. Ultraviolet irradiation was the most common and primary therapeutic modality. Other treatments included topical glucocorticoids or calcineurin inhibitors, and systemic use of immunomodulators including interferon. Long-term follow-up analysis showed that 90.32% of patients achieved reduction of leukoderma after ultraviolet irradiation therapy, 32.26% had complete regression of hypopigmented macules, and the recurrence rate of leukoderma within 1 year was 35.48%.

Learning Objectives:

Hypopigmented mycosis fungoides occurs predominantly in minors, especially children under 12 years of age. Lesions commonly develop on the extremities and trunk, but may also involve the face and neck. Dermoscopy and reflectance confocal microscopy can assist in diagnosis, whereas histopathology and immunohistochemistry remain the most important gold standard for diagnosing hypopigmented mycosis fungoides. Long-term follow-up reveals a recurrent disease course in some patients, and ultraviolet irradiation therapy is most likely to achieve regression of hypopigmented macules.

P5: Epidemiology

P.14

Do Surgical Implants Trigger Autoimmune Depigmentation? A Global Study of Orthopedic and Breast Prostheses

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Introduction: Recent reports suggest that implanted medical devices may trigger vitiligo via immune or hypersensitivity mechanisms. Current evidence is limited to small case series, with no large-scale epidemiologic studies available. We evaluated whether major orthopedic joint replacements or synthetic breast implants increase the risk of developing vitiligo compared with surgical controls.

Methods, Results: We conducted a retrospective cohort study using the TriNetX Global Collaborative Network, including 170–171 healthcare organizations. Two analyses were performed: (1) patients undergoing major orthopedic joint replacements (ICD-10-PCS 0SR/0RR) were compared with controls undergoing upper joint inspection procedures (ICD-10-PCS 0RJ/0SJ), and (2) patients receiving synthetic breast implants (ICD-10-PCS/CPT 0H0*, 0HR*, 19325, 19340, 19342, 11970) were compared with controls undergoing mastopexy, breast reduction, or partial mastectomy (CPT 19316, 19318, 19301). Propensity score matching (1:1) balanced age, sex, race, and relevant comorbidities for both analyses (standardized mean differences <0.1). In the breast implant analysis, matching also included a history of breast cancer, radiation, and chemotherapy. The primary outcome was incident vitiligo (ICD-10: L80), with cohorts followed for up to five years. In the orthopedic cohort (58,773 patients per group), vitiligo occurred in 28 patients in the implant group versus 36 in controls (risk ratio [RR] 0.78; 95% CI 0.48–1.27; P = 0.317). In the breast surgery cohort (66,498 patients per group), 43 cases occurred in each group (RR 1.00; 95% CI 0.66–1.53; P = 0.999). No statistically significant increase in vitiligo risk was observed in either cohort.

Conclusion: In this large-scale analysis of over 250,000 matched patients, exposure to synthetic orthopedic or breast implants was not associated with an increased risk of developing vitiligo. These findings provide evidence-based reassurance that commonly used surgical implants do not appear to trigger autoimmune depigmentation.

Learning Objectives:

1. Identify the incidence of new-onset vitiligo following major orthopedic and breast implant procedures using large-scale health data.
2. Evaluate whether common surgical prostheses serve as triggers for systemic autoimmune depigmentation.
3. Provide evidence-based clinical reassurance regarding the safety profile of common surgical implants in relation to vitiligo.

P.15

Prevalence of Metabolic Syndrome in Mexican Adults With Non-segmental Vitiligo

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1. IMSS para el Bienestar Ciudad de México, Mexico City, CMX, Mexico, 2. Universidad Nacional Autónoma de México, Mexico City, CMX, Mexico

Introduction: Introduction. Vitiligo has been increasingly associated with systemic inflammation and cardiometabolic comorbidities; however, data on Latin American populations remain limited. This study evaluated the prevalence of metabolic syndrome and characterized body composition in a cohort of Mexican adults with nonsegmental vitiligo.

Methods, Results: A cross-sectional study was conducted at the Centro Dermatológico Dr. Ladislao de la Pascua, Mexico City. Adults with nonsegmental vitiligo underwent clinical evaluation, assessment of affected body surface area using the Vitiligo Extent Score, anthropometric measurements, vital signs, laboratory testing (including fasting glucose, lipid profile, and uric acid), and body composition analysis using an OMRON HBF-514C monitor. Metabolic syndrome was defined as the presence of at least three of the five harmonized criteria.

A total of 153 patients were included, of whom 69.3% were women, with a mean age of 43.6 years (SD 16.6). The median affected body surface area was 1.14% (IQR 0.24-6.88). Metabolic syndrome was identified in 28.1% (n = 43/153) of participants. The mean body mass index was 26.1 kg/m2 (SD 5.04); 46.8% of participants were overweight, and 17.0% were obese. The mean body fat percentage was 36.53% (SD 8.62), mean visceral fat was 8.55% (SD 3.37), and mean muscle mass was 27.33% (SD 5.86).

Table 1. Body composition parameters in the study population

Variable	Mean (%)	SD
Muscle mass	27.33	5.86
Body fat	36.53	8.62
Visceral fat	8.55	3.37

SD: standard deviation

Conclusion: Conclusion. Metabolic syndrome was prevalent in this Mexican cohort of adults with nonsegmental vitiligo and was accompanied by a high burden of excess adiposity. These findings support the integration of cardiometabolic screening into routine vitiligo care and underscore the need for longitudinal studies to elucidate the temporal and biological relationships between vitiligo and metabolic risk.

Learning Objectives:

1. Recognize the prevalence of metabolic syndrome in a Mexican cohort of adults with nonsegmental vitiligo.
2. Identify the body composition findings that support cardiometabolic risk assessment in patients with vitiligo.

P6: Medical Treatment

P.16

Efficacy of Vitamin C, E, and Ferulic Acid Serum for Managing Post-Excimer Laser Hyperpigmentation in Patients with Facial Vitiligo

Bae, Jung Min, Ju, Hyun Jeong, Han, Ju Hee

The Catholic University of Korea, Seoul, Korea

Introduction: Vitiligo is a common chronic depigmenting dermatological disorder affecting approximately 1% of the population. While novel therapeutic agents continue to emerge, phototherapy including excimer laser treatment, remains the standard of care. However, repeated ultraviolet radiation exposure frequently induces unwanted hyperpigmentation, which can significantly impact patients' quality of life during the treatment process. Vitamin C serum has been recognized for its properties not only as an antioxidant but also for its efficacy in treating hyperpigmentation. This study aimed to evaluate whether the application of a serum containing Vitamin C, Vitamin E, and ferulic acid could alleviate post-excimer laser hyperpigmentation in facial vitiligo patients while maintaining treatment efficacy.

Methods, Results: Four patients with facial vitiligo who developed hyperpigmentation during treatment with twice-weekly excimer laser therapy and twice-daily topical tacrolimus 0.1% application were enrolled. The intervention involved adding twice-daily application of a serum containing Vitamin C (15% L-ascorbic acid), Vitamin E (1% alpha tocopherol), and ferulic acid (0.5%) to their existing treatment regimen. All patients were evaluated for repigmentation and hyperpigmentation at monthly intervals using UV photography and VISIA® (Canfield, USA) imaging system.

All four patients achieved F-VASI90 (Facial Vitiligo Area Scoring Index 90% improvement), with significant improvement in hyperpigmentation. Patient satisfaction with the combined treatment approach was high in all patients. However, one patient experienced vitiligo recurrence during the three-month follow-up period, although the association between this recurrence and the intervention remains unclear.

Conclusion: The serum containing Vitamin C, Vitamin E, and ferulic acid demonstrated substantial efficacy in managing post-excimer laser hyperpigmentation in vitiligo patients without interfering with the therapeutic effects of excimer laser treatment. This combination therapy represents a promising adjunctive treatment option for managing treatment-related hyperpigmentation while maintaining optimal therapeutic outcomes in facial vitiligo patients.

Learning Objectives:

- To understand the clinical impact of post-excimer laser hyperpigmentation on quality of life in facial vitiligo patients and the rationale for antioxidant-based adjunctive therapy.
- To evaluate the efficacy of a combined Vitamin C, E, and ferulic acid serum in reducing hyperpigmentation without compromising excimer laser repigmentation outcomes.
- To recognize the potential role of topical antioxidant serums as a practical adjunctive strategy in the management of facial vitiligo during phototherapy.

P.17

Expert Consensus on the Safety of Aesthetic Procedures in Patients with Vitiligo: an eDelphi Study

Chen, Sheng-Ni[1], Lai, Yi-Ching[1], Ng, Chau Yee[1, 2, 3]

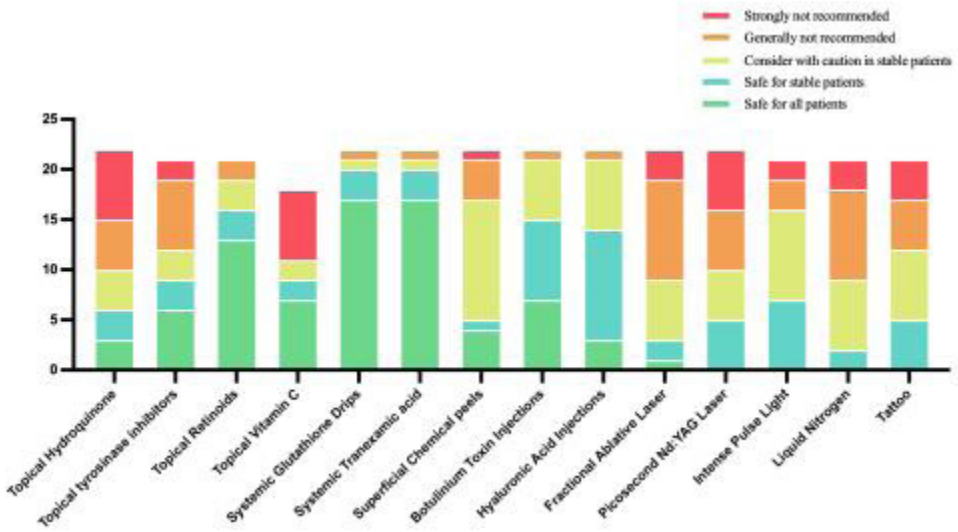
1. Chang Gung Memorial Hospital, Taoyuan, Taiwan, 2. Jen Ai Hospital, Taichung, Taiwan, 3. Chang Gung University, Taoyuan, Taiwan

Introduction: Despite the rising demand for aesthetic procedures in vitiligo patients, the risk of triggering the Koebner phenomenon and a lack of high-level clinical evidence pose significant management challenges. This study aimed to establish an international expert consensus to provide structured, evidence-informed safety guidance for aesthetic interventions in this population.

Methods, Results: An eDelphi study was conducted among 22 international pigmentary experts from 12 countries across 6 continents. Modality safety was evaluated using a 5-point Likert scale, with consensus defined as ≥ 70% agreement. Regarding treatment modalities, consensus was reached that topical/systemic tranexamic

acid, vitamin C, retinoids, and most injectables (excluding exosomes) are safe. Conversely, systemic glutathione drips, energy-based devices (EBDs), particularly ablative or melanin-targeted lasers, liquid nitrogen, and tattooing were deemed high-risk (Figure 1). Clinical protocols reached consensus on the necessity of 6–12 months of documented stability and thorough whole-body screening for activity signs (e.g., confetti-like depigmentation, pentachrome sign) using Wood's lamp and dermoscopy. To mitigate the risk of Koebnerization, the panel recommended utilizing test spots, conservative EBD settings, and prophylactic topical immunomodulators, supported by standardized photographic documentation for longitudinal post-procedure monitoring.

Conclusion: This consensus establishes clear, expert-driven safety parameters that bridge the gap between aesthetic demand and clinical risk in vitiligo management. By providing structured pre-, intra-, and post-procedure protocols, these findings support safer physician-patient shared decision-making and promote more consistent care for vitiligo patients seeking cosmetic enhancements.



Learning Objectives:

- Identify which aesthetic modalities are considered safe for vitiligo patients versus high-risk interventions .
- Implement standardized pre-, intra-, and post-procedure protocols requiring 6–12 months of stability, whole-body screening via Wood's lamp/dermoscopy, test spots, conservative device settings, and prophylactic topical immunomodulators, supported by long-term photographic monitoring.
- Apply risk-mitigation strategies, such as test spots, conservative energy settings, and prophylactic immunomodulators, to minimize the risk of the Koebner phenomenon in aesthetic practice

P.18

The Efficacy of Topical Barcitinib and Excimer Light in Non Segmental Vitiligo

Elbadrmany, Yasmin M., Awad, Sara, Aboud, Nora

Assiut University Hospital, Assiut, Egypt

Introduction: Given the reported effectiveness of oral barcitinib in vitiligo as well as the successful results of topical forms of other JAK inhibitors (Ruxolitinib), we expect that baricitinib would have similar effect if used topically with excimer light.The study aims to evaluate the safety and efficacy of the combination of topical baricitinib and 308-nm monochromatic excimer light versus 308-nm monochromatic excimer light alone in treatment of non-segmental vitiligo.

Methods, Results: 30 patients with active non-segmental facial vitiligo were recruited ,Patients were classified in to two groups: Group A (15 patients): treated with topical barcitinib cream twice daily and excimer light twice weekly for 6 months. Group b (15 patients) treated with excimer light only, Digital photographs were taken for each patient, at baseline, every month for 6 months and 3 months after the last session.

Follow-up and assessment: The percent of repigmentation were assessed every month , and 3 month after the last session, The F VASI percent change were calculated by subtracting the pre-procedure VASI score

from the post-procedure VASI score and dividing by the pre-procedure VASI score.Dermoscopy of the treated lesions,patients satisfaction and side effects were asesed.

A fter 6 months , a statstically significant better response in the percent of reduction of F VASI in group A in compare to group B (pv less than 0.005) with better repigmentation response in group A than group B where 20% showed complete response and 60% showed excellent response while 20% showed good response , dermoscopy showed earlier and better repigmenation in group A , side effects were minimal and comparable in both groups . after 3 months of the last session recurrence of lesions in 30% of cases in group A.

Conclusion: Topial barcitinib enhance the efficacy of excimer light in treatment of facial active non segmental vitiligo .

Learning Objectives:

Topical barcitinib is a new therapeutic option for active non segemental vitiligo

Combining excimer light and topical barcitinib provide a safe and effective therapeutic option for vitiligo

P.19

Vitiligo and Alternative Treatments

Khalifa, Marwa A.

General Hospital, Tanta, Egypt

Introduction: Growing patient interest in use of supplement, diet, and lifestyle in treating vitiligo.

Google search results:

Vitiligo & diet: 3.36 million

vitiligo & vitamins: 4.75million

Vitiligo & lifestyle: 1.7 million

Complementary and alternative medicine use in patients with vitiligo

Top reasons for using CAMs

Check up to 3 influencing factors

Conventional therapy has not worked

Concern for side effects of conventional therapy

Easier application /less time commitment

Cost of conventional therapy

Insurance coverage of conventional therapy

Access to healthcare.

Methods, Results: Melanocytes from those with vitiligo are intrinsically defective in managing cellular oxidative stress.

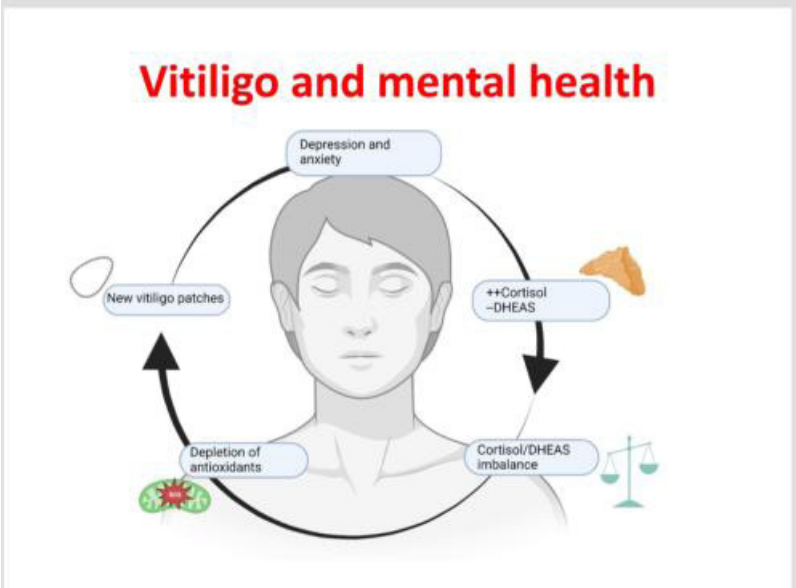
Overproduction of Ros in vitiligo patients.

Both factors may contribute to melanocyte damage and death.

Antioxidants can counteract oxidative stress and reduce UV induced photo oxidative stress thus helping accelerate repigmentation in patients receiving phototherapy.

Vitiligo patients may also have deficiency of certain vitamins and minerals.

Diet and oral supplements with antioxidant properties and which address biological deficiencies in vitiligo patients could serve as beneficial adjunctive vitiligo treatment.



Conclusion: Supplements with antioxidant properties in patients receiving phototherapy can play an adjuvant role in the treatment of vitiligo.

No studies to date have shown benefits of a particular diet in vitiligo patients.

Mental and physical health along with the gut microbiome may also interplay with vitiligo activity.

Current studies are limited in number and many have design flaws which limit generalizability of results.

Future well designed controlled studies using validated scales may help solidify alternative treatments as a vital part of the vitiligo treatment .

Learning Objectives:

1. Illustrating why complementary and alternative medicine use in patients with vitiligo.
2. Identifing Categories of Alternative Treatments.
3. comparing different studies and it's results in using each of alternative treatments for vitiligo

P.20

Demographics and Baseline Clinical Characteristics of Patients Enrolled in the Phase 3 STOP-V Studies of Povorcitinib for Nonsegmental Vitiligo

Passeron, Thierry[1], Ezzedine, Khaled[2], van Geel, Nanja[3], Blauvelt, Andrew[4], Lynde, Charles[5], Kornacki, Deanna[6], Wei, Shaoceng[6], Karanam, Sunanda[6], Pandya, Amit[7]

1. Centre Hospitalier Universitaire de Nice, Université Côte d'Azur, Nice, France, 2. Henri Mondor University Hospital and Université Paris-Est Créteil Val de Marne, Paris, France, 3. Department of Dermatology, Ghent University Hospital, Ghent, Belgium, 4. Blauvelt Consulting, LLC, Annapolis, MD, USA, 5. Division of Dermatology, Temerty Faculty of Medicine, University of Toronto, Toronto, ON, Canada, 6. Incyte Corporation, Wilmington, DE, USA, 7. Palo Alto Foundation Medical Group, Palo Alto, CA, USA

Introduction: Povorcitinib (Janus kinase 1 inhibitor) demonstrated substantial repigmentation over 52 weeks and was well tolerated in a phase 2 dose-ranging study (NCT04818346) in adults with nonsegmental vitiligo (NSV). Here, demographics and baseline clinical characteristics of patients enrolled in 2 ongoing 104-week phase 3 clinical trials are reported.

Methods, Results: STOP-V1 (NCT06113445) and STOP-V2 (NCT06113471) were identical phase 3, randomized, double-blinded, placebo-controlled trials. Eligible patients were aged ≥18 years with NSV, total body surface area (T-BSA) ≥5%, total Vitiligo Area Scoring Index (T-VASI) ≥4, facial BSA (F-BSA) ≥0.5%, facial VASI (F-VASI) ≥0.5, and investigator-assessed eligibility for systemic therapy. Patients were randomized 1:1 to 30 mg povorcitinib or placebo once daily for 52 weeks, with randomization stratified based on F-VASI (<1.5 vs ≥1.5), T-VASI (4–20

vs >20), and Fitzpatrick skin type (I–II vs III–VI). The primary endpoint was the proportion of patients achieving ≥75% improvement in F-VASI at Week 52. Among patients enrolled in STOP-V1 (N=467) and STOP-V2 (N=449), median (range) age was 48.0 (18–89)/46.0 (18–79) years; most patients were female (55.0%/57.0%) and White (79.4%/84.9%). Patients with all Fitzpatrick skin types were included and distributed as follows: type I, 6.0%/1.8%; II, 36.4%/30.1%; III, 34.3%/40.8%; IV, 16.9%/18.0%; V, 4.1%/7.6%; and VI, 2.1%/1.8%. Mean values for baseline disease extent measures were as follows: T-BSA, 21.4%/24.7%; T-VASI, 19.5/23.0; F-BSA, 1.14%/1.26%; and F-VASI, 1.05/1.17. Median (range) disease duration was 16.2 (0.1–61.9)/18.3 (0.1–59.3) years, and 68.5%/71.5% of patients had vitiligo for >10 years. Most patients had stable disease at baseline (61.2%/70.6%), and 39.2%/40.5% of patients had received prior medications for vitiligo. Of selected comorbidities, the most common was thyroid disorder (15.0%/14.5%).

Conclusion: The phase 3 STOP-V1 and STOP-V2 studies enrolled large, clinically diverse populations of adults with extensive NSV, supporting the relevance of forthcoming povorcitinib efficacy and safety evaluation.

Learning Objectives:

- Understand the study design of the STOP-V1 and STOP-V2 phase 3 trials evaluating povorcitinib in patients with nonsegmental vitiligo
- Describe the demographics and clinical characteristics of patients enrolled in these studies

P.21

Safety of Low-Temperature Argon Plasma in the Treatment of Non-Segmental Vitiligo

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Introduction: Vitiligo is a chronic depigmenting skin disorder that has a substantial impact on patients' psychosocial wellbeing.Currently available treatment options, including long-term use of topical corticosteroids and phototherapy, have several limitations related to adverse effects and depend on skin phototype.

Methods, Results: This open-label, non-comparative clinical study included patients with a confirmed diagnosis of non-segmentalvitiligo (n = 22), aged 18–65 years, with a body surface area involvement ranging from 1% to 10%. The participant enrollment and intervention period lasted 8 weeks (20 procedures, 3 times a week), followed by a 1-month follow-up period. Procedures were conducted using the plasma-arc surgical system Plazmoran. DLQI scores significantly improved, declining from 18.6 ± 5.4 to 14.2 ± 4.8, 9.8 ± 3.6, and 7.4 ± 2.9, respectively ($p < 0.001$), indicating a marked improvement in quality of life.

Conclusion: Therapy with low-temperature argon plasma using the Plasmoran system demonstrated a favorable safety profile in patients with non-segmental vitiligo.The method was not associated with serious adverse events characteristic of conventional therapies (skin atrophy or telangiectasia).

Learning Objectives:

vitiligo; low-temperature argon plasma; safety

P.22

Intralesional Methotrexate in Localized Vitiligo: Experience from Tertiary Care Centre in India

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Introduction: Vitiligo is an immune-mediated depigmenting disorder characterized by selective destruction of epidermal melanocytes, resulting in well-defined depigmented macules. Multiple therapeutic modalities have been employed with variable outcomes. This study aimed to assess the safety and efficacy of intralesional methotrexate in patients with localized vitiligo.

Methods, Results: A total of 40 patients with localized vitiligo were enrolled. Participants received intralesional methotrexate injections at 2-week intervals for a maximum of six sessions. Treatment response was evaluated based on the extent of repigmentation and categorized as: excellent (>75%), good (50–75%), fair (25–50%), and poor (<25%).

The study included 31 males (77.5%) and 9 females (22.5%) , with a mean age of 33.6 ± 8.6 years. Disease duration ranged from 1 to 22 years, and 5 patients (12.5%) had a positive family history. A statistically highly significant improvement in repigmentation was observed following treatment ($p < 0.001$).

Conclusion: Intralesional methotrexate appears to be a safe and effective therapeutic option for localized vitiligo. Larger studies are warranted to validate these findings and to determine the optimal dosing regimen and long-term outcomes.

Learning Objectives:

- To evaluate the therapeutic potential of intralesional methotrexate in localized vitiligo.
- To assess the clinical efficacy of intralesional methotrexate based on repigmentation outcomes.
- To highlight the need for further large-scale studies to establish optimal dosing and long-term outcomes.

P.23

Fractional CO_2 Laser–Assisted Delivery of Stem Cell–Derived Exosomes in Stable Vitiligo Resistant to Standard Therapy: a Retrospective Randomized Controlled Cohort

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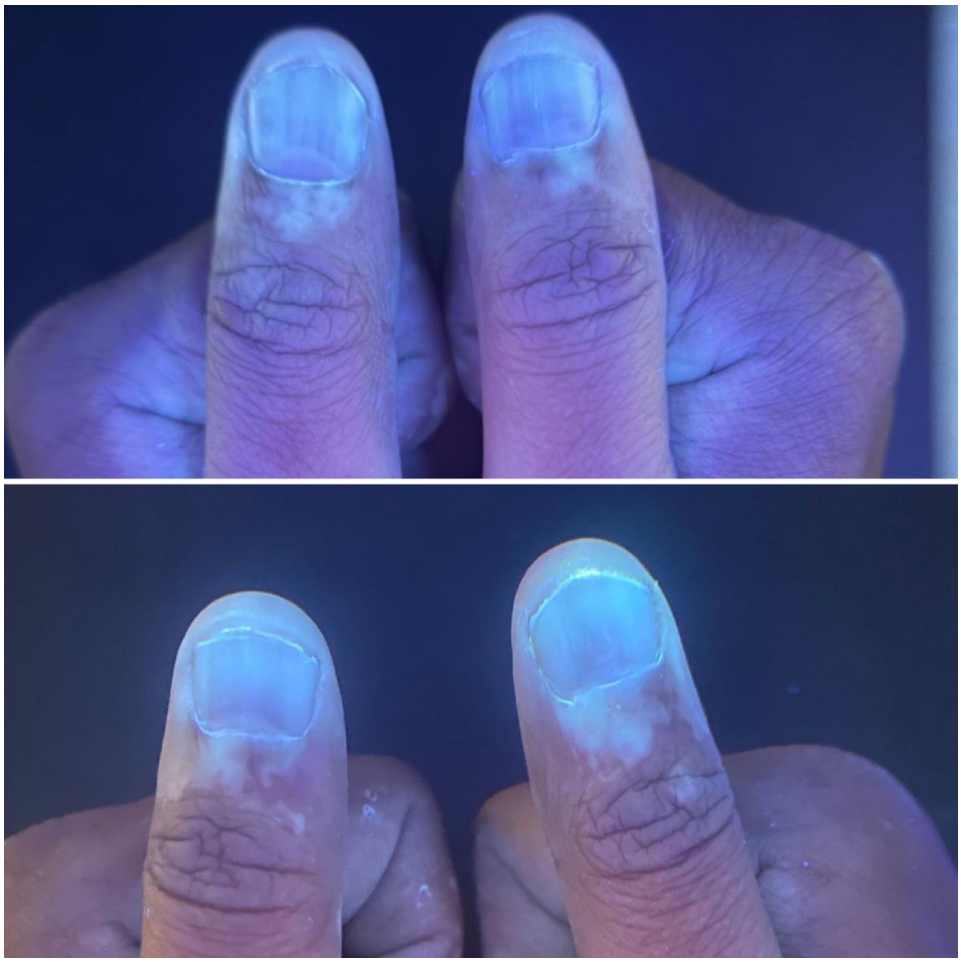
Introduction: Treatment-resistant stable vitiligo remains a therapeutic challenge, especially in patients with suboptimal response to targeted phototherapy and topical immunomodulators. Stem cell–derived exosomes are emerging as biologically active agents capable of modulating melanocyte function, oxidative stress, and local immune responses. Device-assisted delivery may enhance their therapeutic potential and offer a minimally invasive alternative to grafting.

Methods, Results: This retrospective randomized cohort included 16 patients with 27 stable vitiligo patches showing inadequate response to 24 weeks of excimer therapy plus topical tofacitinib (morning) and tacrolimus (evening). Lesions were randomized to: A) fractional CO_2 laser followed by topical stem cell–derived exosomes (n=14) or B) fractional CO_2 laser alone (n=13). Three sessions were performed at 4-week intervals, with 12-week post-treatment follow-up. Blinded VASI-based evaluation captured degree and onset of repigmentation, pattern, leukotrichia reversal, and adverse events.

Exosome-assisted delivery yielded higher rates of ≥50% repigmentation (64% vs 31%), earlier perifollicular onset (8.2 vs 10.4 weeks), and more homogeneous, cosmetically acceptable repigmentation, particularly on the face. Most responsive lesions showed perifollicular activation progressing to marginal spread. Among five patients with leukotrichia, three in the exosome group showed early hair shaft repigmentation; none occurred with fractional CO_2 alone. Both treatments were well tolerated, with only transient erythema and crusting.



Conclusion: Fractional CO_2 laser–assisted delivery of stem cell–derived exosomes appears safe and more effective than fractional CO_2 alone for stable, treatment-resistant vitiligo, with faster, greater repigmentation and leukotrichia reversal in some patients, suggesting a regenerative, "graft-mimicking" effect. Nonetheless, the retrospective design and small sample render these data hypothesis-generating, underscoring the need for standardized exosome products and dosing, clear regulatory guidance, and well-designed prospective controlled trials to define their true place in vitiligo management.

Learning Objectives:

- To compare the efficacy of fractional CO_2 laser–assisted delivery of stem cell–derived exosomes versus fractional CO_2 laser alone in stable, treatment-resistant vitiligo.
- To evaluate onset, pattern, and quality of repigmentation, including leukotrichia reversal, in both groups.
- To assess the safety and tolerability of both approaches.

P.24

Topical Ruxolitinib and Latanoprost for Vitiligo: Real-World Data From Latin-American Patients—A Case Series

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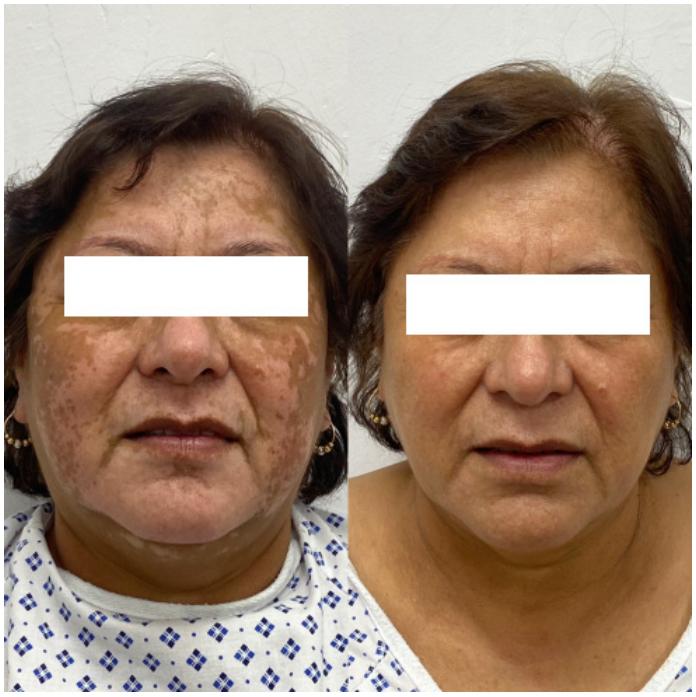
Introduction: Topical ruxolitinib, a Janus kinase (JAK) 1/2 inhibitor, has demonstrated efficacy in the treatment of vitiligo[1]; however, real-world data in Latin American population, particularly in combination regimens, remain limited. Additionally, prostaglandin analogues such as latanoprost may promote repigmentation by stimulat-

ing melanocyte activity, supporting their potential use in combination therapies[2]. This study was conducted to evaluate the effectiveness and safety of topical ruxolitinib and latanoprost in non-segmental vitiligo.

Methods, Results: We conducted a prospective study including patients with non-segmental vitiligo treated with topical ruxolitinib 1.5% combined with latanoprost 0.01% cream applied twice daily. All patients additionally received narrowband ultraviolet B phototherapy twice weekly.

The mean age was 46 years (range: 14–65). Clinical follow-up (FU) included assessment of repigmentation at 3, 6, and 12 months, as well as monitoring for adverse events.

9/10(90%) patients achieved >90% repigmentation, mainly observed in facial lesions, as early as 8 weeks. At 3 months, 4/10(40%) achieved 1-25% repigmentation; 3/10(30%) achieved 26-50% and 3/10(30%) achieved 51-75% repigmentation. At the second FU visit (mean 6.8 months), 3/10(30%) presented with 26-50% improvement and 5/10 (50%) achieved excellent repgimentation (75-99%). At the third FU visit (12.8 months), 6/10(60%) presented with 75 to 99% repigmentation and 3/10 (30%) presented with 100% repigmentation. Only one patient exhibited moderate improvement (25–50%), likely due to poor treatment adherence and the presence of leukotrichia. The longest follow-up was 35 months, with sustained results. Side effects, included: erythema, mild acne and flushing.



Conclusion: Topical ruxolitinib combined with latanoprost appears effective and safe in non-segmental vitiligo. NB-UVB enhances repgimentation in non-sun exposed areas. Further studies are needed to define long-term safety and outcomes.

Learning Objectives:

1. Evaluate the effectiveness and safety of topical ruxolitinib and latanoprost in the management of vitiligo in real-world settings.

P.25

Rapid Re-pigmentation of Facial Non-Segmental Vitiligo with Oral Upadacitinib and NB-UVB Phototherapy Combination Therapy

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Introduction: Vitiligo is an autoimmune disease characterized by cutaneous depigmentation and presents therapeutic challenges with current modalities. Emerging evidence highlights the potential of Janus kinase (JAK) inhibitors in disease management.

Object: To assess the efficacy of the JAK1 inhibitor upadacitinib combined with narrowband ultraviolet B (NB-UVB) phototherapy for non-segmental facial vitiligo treatment.

Methods, Results: This retrospective case series analyzed 12 non-segmental facial vitiligo patients receiving upadacitinib (15 mg daily) combined with NB-UVB phototherapy (311 nm, thrice weekly). Treatment parameters including phototherapy sessions and initial repigmentation time were documented. Disease severity was evaluated using Facial Vitiligo Area Scoring Index (F-VASI), while quality of life was assessed via Dermatology Life Quality Index (DLQI). Additionally, treatment safety was monitored through adverse event frequency and severity.

Patients completed 5.4±1.8 months of upadacitinib treatment alongside 33±8 NB-UVB sessions. Initial repigmentation occurred at a median of 4 weeks (range 3-6). F-VASI scores showed significant reduction from baseline 1.6±0.7 to 0.2±0.2 post-treatment. All patients achieved ≥50% improvement, with 9 patients attaining ≥75% improvement (including 4 patients complete responders). DLQI scores improved from 16.2±5.9 to 3.2±2.5, with 5 patients achieving full quality-of-life restoration(DLQI≤2). No severe adverse events were recorded.

Conclusion: Upadacitinib combined with NB-UVB phototherapy demonstrated rapid therapeutic efficacy for non-segmental facial vitiligo. While the short-term safety of upadacitinib was manageable, long-term adverse effects warrant further investigation.

Learning Objectives:

vitiligo treatment

P7: Phototherapy

P.26

Extended Phototherapy Sessions and Their Effect on Serum Beta-Endorphin and Well-Being in Vitiligo Patients

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Introduction: Beyond its visible esthetic impact, vitiligo often undermines self-esteem, social interactions, and quality of life. Phototherapy presents the backbone of repigmentation modalities at all stages. Ultraviolet radiation (UVR) exposure increases beta-endorphin production, a molecule involved in pain relief and reward pathways.

Methods, Results: To evaluate the impact of extended phototherapy sessions on serum beta-endorphin levels and overall well-being in vitiligo patients.

This prospective case-control study included 153 participants: 51 vitiligo patients receiving total body narrowband ultraviolet B (NB-UVB) for at least one year, 51 age- and sex-matched healthy controls, and 51 vitiligo patients not receiving NB-UVB. Disease activity and extent were assessed using the Vitiligo Signs of Activity Score (VSAS) and Vitiligo Extent Score Plus (VES PLUS). Quality of life was assessed using the Vitiligo-Specific Quality-of-Life Instrument (VitiQoL). A specially designed questionnaire assessed dependence scores. Serum beta-endorphin levels were measured using ELISA.

NB-UVB-treated patients had significantly longer disease duration, higher mean VES PLUS scores, and greater body surface area involvement than untreated patients ($p < 0.001$). Median serum beta-endorphin levels were highest in NB-UVB-treated patients, intermediate in untreated patients, and lowest in controls (204.15, 160.50, and 109.05 pg/ml, respectively). Beta-endorphin levels depended on recent treatment exposure rather than cumulative dose, disease severity, VitiQoL scores, or dependency scores (all $p > 0.05$). Full-body skin examination revealed no suspicious lesions or prior treated skin cancer.

Conclusion: Vitiligo is associated with reduced systemic beta-endorphin levels, reflecting endogenous opioid dysregulation. NB-UVB phototherapy acts as a transient modulator, inducing beta-endorphin elevations dependent on recent exposure rather than cumulative dose or disease severity. These findings position beta-endorphin as a marker of systemic photobiological response and broaden understanding of NB-UVB's neuroendocrine impact in vitiligo.

Learning Objectives:

1. **Analyze the relationship between narrowband ultraviolet B (NB-UVB) phototherapy and serum beta-endorphin levels in vitiligo patients**,

2. **Evaluate the differences in serum beta-endorphin concentrations and quality of life measures** among NB-UVB-treated vitiligo patients, untreated vitiligo patients, and healthy controls.
3. **Assess the role of NB-UVB phototherapy as a transient neuroendocrine modulator in vitiligo**, explaining how extended phototherapy sessions may influence systemic beta-endorphin production independently of disease extent or repigmentation outcomes.

P.27

Efficacy of The Combination of Excimer Light and Microneedling either with Pentoxifylline or with 5-fluorouracil in Treatment of Vitiligo: a comparative Study

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Introduction: Vitiligo is a chronic skin condition characterized by depigmentation, resulting in white patches on the skin. Recent advancements in dermatological therapies, such as excimer laser and microneedling, offer promising results in the management of vitiligo. This abstract compares the mechanisms, efficacy, and clinical outcomes of 5-fluorouracil and pentoxifylline in the treatment of vitiligo. It highlights the advantages and limitations of each therapy, providing insights into their roles in vitiligo management and potential synergistic effects when used in combination with other treatments.

Methods, Results: 22 patients of vitiligo were included in the study. Inevery patient two patches were chosen to be treated. Both are exposed to Excimer light; One patch treated with microneedling and 5-FU and the other patch with microneedling and pentoxifylline.

Mostly symmetrical two patches were selected in every patient to be treated, the selected two patches should be at the same body areas, and the area of one patch should not exceed the double of the other.

Clinical outcomes were assessed based on the degree of repigmentation, side effects, and patient satisfaction over a 6-month period.

In patch A, 4 cases of the studied participants (18.2%) and 2 cases (9.1%) experienced very good and excellent grades of re-pigmentation (G4, G3), while 4 patients (18.2%) showed poor grade of re-pigmentation (G0). In patch B, no one of the studied participants experienced re-pigmentation (G4),2 patients (9.1%) showed (G3), eight patients (36.4%) showed (G2),8 patients (36.4%) showed (G1) and 4 patients (18.2%) showed re-pigmentation (G0)

Conclusion: Conclusion: the results of this study showed that needling combined either with 5-Flurouracil or pentoxifylline in treatment of localized stable vitiligo has the advantages of low cost, good efficacy, well-tolerability, and of less side effects,whereas using excimer light in combination with 5-FU solution after microneedling is slightly more effective than the combination with Pentoxifylline solution.

Learning Objectives:

To compare the efficacy of the Combination of Excimer Light and Microneedling either with Pentoxifylline or with 5-fluorouracil in Treatment of Vitiligo.

P.28

Autofluorescence Biomarkers of Vitiligo Detected by Non-invasive in vivo Excitation-Emission Matrix Spectroscopy

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Introduction: The optical features and appearance of vitiligo have been explained primarily on the basis of reduced epidermal melanin, which results in white skin patches. The objective of this study is to identify potential biomarkers of vitiligo lesion and adjacent normal-appearing skin using in vivo fluorescence excitation-emission matrix (EEM) spectroscopy.

Methods, Results: Thirty-five vitiligo patients were recruited and measured with a double grating spectrofluorometer in the excitation wavelength range of 260-450 nm and emission wavelength range of 300-700 nm. To dif-

ferentiate fluorescence biomarker signals obtained from vitiligo lesions, measurements were also conducted and compared with pigmentation differences of dorsal forearm and upper inner arm of 30 normal subjects.

The most pronounced difference between vitiligo lesion compared to adjacent normal-appearing skin was the much higher overall superficial and bilayer fluorescence in vitiligo. Excitation spectra from vitiligo lesion to normal-appearing skin revealed three distinctive spectral peaks centered around 270-295, 310 and 335 nm that may potentially serve as biomarkers for vitiligo. The 270-295 nm band may be related to inflammation, melanin precursors (ie. tyrosine) and/or epidermal proliferation as vitiligo is an autoimmune disease, whereas the 335 nm band may be related to depletion of melanin and photoaging due to decreased melanin protection. The 310 nm band may be related to accumulation of hydrogen peroxide (H_2O_2) in vitiligo lesions, which corresponds to wavelength of narrowband ultraviolet-B therapy to treat vitiligo.

Conclusion: Biomarkers identified through spectral peaks with EEM may be used to study vitiligo pathogenesis, disease progression and/or response to different treatment options.

Learning Objectives:

- Understand the fluorescence excitation emission matrix (EEM) spectroscopy technique
- Understand the potential autofluorescence biomarkers that are associated with localized inflammation, epidermal proliferation, photoaging and excessive oxidative stress in vitiligo

P8: Surgical Treatment

P.31

Repigmentation by Reverse Koebner Phenomenon in a VitiligoPatients Treated with Topical Application of TCA 80%

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Introduction: Vitiligo is a skin disease which is characterized by well – defined depigmented patches due to decreased melanin production in the epidermis of skin and hair follicles .The molecular mechanisms are not yet fully determined. Koebner phenomenon is a skin condition that is named after Heinrich Koebner who discovered it in 1876 for the first time .koebner phenomenon describes the appearance of new lesions on previously normal sites after local trauma .The type of the trauma can be a physical injury ,chemical injury, thermal injury . Reverse Koebner phenomenon is a significantly rarer condition that describes the disappearance or improvement of lesions following trauma .there are only a few cases reported in the literature .Cases of reverse koebner phenomenon after Application of TCA at vitiliginous lesions are even fewer.

Methods, Results I have selected Vitiligo patients who are characterized with positive koebner phenomenon whether they have active or stable vitiligo and they were resistant to traditional methods of vitiligo therapy. Trichloroacetic acid (TCA 80%) was applied to cover the vitiliginous area using a toothpick , taking care to avoid edges of the vitiliginous area.TCA application is performed from the center of the vitiligo area towards the edges of the vitiligo area staying away from the edges for a distance of 2 mm , note that the end point of was the appearance of a uniform frosting on the affected areas .we repeated it every 4 weeks with the same precautions .

Inoticed marginal repigmentation in the vitiligo area leading to reduction in vitiligo area size .In almost most cases peripheral repigmentation occurred morethan other types of repigmentation .

Conclusion: This study describes current recommendation on management of vitiligo patients who characterized with positive koebnerphenomenon and resistance to traditional therapy by reverse koebnerization with topical TCA 80% .

Learning Objectives:

1. Recognize Koebner and reverse Koebner phenomena in vitiligo.
2. Describe the role of 80% TCA in inducing repigmentation.
3. Recognize chemical trauma as a potential therapy in resistant vitiligo.

P.32

Low-Cost Modified Jodhpur Technique Using Manual Manekshaw Dermabrader and Sterile Polyethylene Dressing Layer in the Treatment of Stable Vitiligo

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Introduction: Vitiligo poses a significant therapeutic challenge, particularly in resource-limited settings. The Jodhpur technique is an established surgical modality for melanocyte transfer in stable vitiligo. However, the need for cost-effective modifications remains essential. This study evaluates a low-cost modified approach using a manual Manekshaw dermabrader combined with a sterile polyethylene dressing layer, with adjunctive excimer laser therapy to enhance outcomes.

Methods, Results: A large cohort of patients with clinically stable vitiligo was included. Donor and recipient sites were prepared using a manual Manekshaw dermabrader to harvest and apply melanocyte-rich material. A sterile polyethylene dressing layer was used to secure the graft. Postoperatively, patients received targeted Excimer laser therapy starting two weeks after the procedure, administered twice weekly. Clinical evaluation and photographic documentation were performed, with follow-up at 3 months to assess repigmentation and safety.

Most patients achieved satisfactory to excellent repigmentation with good color match. Early signs of repigmentation were observed during follow-up, with progressive improvement over time. The addition of excimer laser appeared to enhance repigmentation outcomes. The procedure was well tolerated, with minimal complications reported, and the polyethylene dressing contributed to improved graft stability.

Conclusion: This modified low-cost Jodhpur technique, combined with adjunctive excimer laser therapy, represents an effective, safe, and accessible treatment option for stable

Learning Objectives:

By the end of this presentation, participants will be able to:

1. Describe the modified low-cost Jodhpur technique using a manual Manekshaw dermabrader and sterile polyethylene dressing layer.
2. Evaluate the effectiveness and safety of this approach in achieving repigmentation in stable vitiligo.
3. Analyze the additive impact of adjunctive excimer laser therapy on repigmentation outcomes following the modified technique.

P.33

The Role of Mini-oral Pulse Steroid Therapy in Melanocyte Keratinocyte Transplantation: a Randomized Controlled Trial

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Introduction: Melanocyte keratinocyte transplantation (MKTP) is an established treatment modality for resistant cases of vitiligo. The number of CD8+ T cells in the perilesional skin have been found to negatively correlate with post-surgical repigmentation.

This study aimed at assessing the value of mini-oral pulse steroid therapy in improving repigmentation in both segmental and non segmental vitiligo (NSV).

Methods, Results: This was a randomized controlled trial that was conducted at a tertiary care center. Forty non-segmental vitiligo (NSV) patients and twenty segmental vitiligo patients were evaluated, of which 26 cases of NSV and 16 cases of segmental vitiligo were recruited and randomized into either MKTP (group A) or MKTP and mini-oral pulse dexamethasone (MOP) 5 mg /week for 8-weeks in the peri surgical period (group B). Twice weekly Excimer light sessions were started 2 weeks following surgery until complete pigmentation or for a maximum duration of 6 months.

A total of 16 segmental vitiligo patients and 26 NSV cases completed the study. Eight segmental vitiligo patients and 13 NSV patients were randomized to each group.

Almost complete repigmentation (≥90%) was reported in 5 segmental vitiligo cases (62.5%) and 7 NSV patients (53.8%) in group B compared to 5 segmental vitiligo patients (62.5%) and 6 NSV patients (46.15%) in group A.

Defective marginal pigmentation; defined as irregular depigmented areas at the margin of the lesions, was noted in 7 patients of segmental vitiligo (87.5%) and 9 patients of NSV (69.2%) in group A versus 5 patients of segmental vitiligo (62.5%) and 7 patients (53.8%) of NSV in group B.

Conclusion: Adding mini-oral pulse steroid has not improved the chances of complete repigmentation; however, improved marginal pigmentation was noted in the mini-oral pulse steroid group possibly due to suppressing the previously detected perilesional CD8+ T cells which have been proposed as a poor prognostic factor..

Learning Objectives:

1. Assessing the value of adding mini-oral pulse steroid therapy in the perisurgical period in improving the surgical outcome
2. Comparing both segmental and non-segmental vitiligo as regards surgical outcome with added mini-oral pulse steroid therapy.

P.34

Cadaver-Based Simulation for Comprehensive Hands-on Training in Vitiligo Surgery: A High-Volume Scalable Model

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Introduction: Vitiligo surgery requires high technical precision, yet training is limited by ethical constraints, variability in patient availability, and restricted opportunities for repetitive practice. Simulation-based training in dermatologic surgery remains underutilized, with no established model for comprehensive, technique-inclusive learning.

Objective: To develop and implement a cadaver-based simulation model for high-volume, hands-on training in vitiligo surgery and assess its feasibility and educational value.

Methods, Results: A structured surgical workshop was conducted under the aegis of the Vitiligo Foundation of India at Nair Hospital and TN Medical College using eight fresh cryopreserved cadavers preserved at -20°C without formalin. A total of 160 dermatologists were trained in two sequential batches of 80 participants. Eight operative stations were created, each supervised by two expert faculty members, with 10 trainees per table. Cadavers were utilized for both batches by sequential anterior and posterior use.

Participants performed all major vitiligo surgical techniques, including punch grafting (manual and motorized), suction blister grafting, smash grafting, and non-cultured epidermal cell suspension. Each participant independently executed donor harvesting, dermabrasion (including difficult anatomical sites), trypsinization, and preparation of cellular suspension.

All participants completed hands-on training across all techniques. The cadaveric model enabled unrestricted, repeated practice of critical steps and provided realistic tactile feedback, particularly for dermabrasion and suction blister induction. The structured format ensured uniform exposure and consistent mentor-guided learning across a large cohort. Post-workshop feedback indicated that over 90% of participants reported improved procedural confidence and better understanding of key surgical steps.

Conclusion: Conclusion: Cadaver-based simulation is a feasible, reproducible, and scalable model for vitiligo surgery training. It addresses key limitations of conventional workshops and enables standardized skill acquisition. This approach has the potential to serve as a global benchmark for training in vitiligo and procedural dermatology.

Learning Objectives:

- High anatomical accuracy
- Safe skill acquisition for vitiligo surgery
- Ethically appropriate training

P.36

Office-Based Procedural Approaches in Vitiligo

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Introduction: Vitiligo remains therapeutically challenging, particularly in localized treatment-stubborn patches or in cosmetically significant areas. Office-based procedures provide practical, minimally invasive options for both repigmentation and depigmentation. Their use remains underrecognized and inconsistently adopted worldwide. Bridging these global practice gaps is essential to expand treatment accessibility and optimize patient outcomes.

Objective: To evaluate the mechanisms, indications, efficacy, and safety of commonly used office-based procedures in vitiligo management, and to highlight their role in diverse clinical settings to bridge global practice gaps.

Methods, Results: A focused narrative review is conducted on chemical and pharmacologic interventions, including trichloroacetic acid (TCA) peeling, phenol application, and topical or intralesional 5-fluorouracil (5-FU), along with adjunctive techniques such as needling and combination therapies. Emphasis is placed on indications, procedural techniques, and reported outcomes.

TCA induce controlled epidermal injury, promoting melanocyte migration and perifollicular repigmentation in vitiligo, while also serving as depigmenting agents in selected cases not suitable for phenol. 5-FU enhances repigmentation, particularly when combined with epidermal disruption techniques, by stimulating melanocyte activation and migration. Combination approaches generally yield superior and faster responses compared to monotherapy. These procedures are most effective in stubborn, localized disease and in cosmetically sensitive areas. Reported adverse effects are typically mild and transient. Despite their practicality and cost-effectiveness, these procedures remain underutilized or unfamiliar in some regions due to limited awareness, training variability, and lack of standardized protocols.

Conclusion: Office-based procedures represent versatile, cost-effective tools that can help bridge global practice gaps in vitiligo management. Increasing awareness, training, and standardization are key to facilitating their broader adoption and integration into routine practice, particularly in resource-limited settings.

Learning Objectives:

1. Identify commonly used office-based procedures for repigmentation and depigmentation in vitiligo.
2. Understand their mechanisms of action, indications, and safety profiles.
3. Recognize how these procedures can help bridge global practice gaps and improve access to vitiligo care.

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Excimer Light Priming of Donor Site Prior to Non-cultured Epidermal Cell Suspension Grafting: Preliminary Results of Controlled Clinical Trial

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Introduction: Vitiligo is an acquired depigmenting disorder with significant psychosocial burden. Surgical modalities such as non-cultured epidermal cell suspension (NCECS) offer repigmentation in stable disease. However, variability in outcomes persists. Which highlights the need for advanced surgical optimization strategies. Excimer light (308 nm) is shown to stimulate melanocyte proliferation, migration, and melanogenesis, suggesting a potential role in enhancing donor site quality prior to grafting.

Objective: To evaluate the efficacy, safety, and tolerability of donor site priming with excimer light prior to NCECS compared to conventional NCECS without priming.

Methods, Results: This was a prospective randomized controlled clinical trial including 30 patches of stable vitiligo resistant to medical therapy. Patches were randomized into two groups: Group A underwent donor site priming with excimer light (2–3 sessions/week for 3 weeks), while Group B received no priming. All patches underwent NCECS with standard recipient site preparation. Outcomes included extent and quality of repigmen-

tation at 1 and 3 months in addition to physician global assessment, and patient satisfaction. Safety was evaluated through reported adverse effects. Immunohistochemical analysis of melanocyte activity was also performed.

Conclusion: This study explored a simple, accessible modification to improve NCECS outcomes and aimed to help optimize vitiligo surgery protocols to improve outcomes particularly in resource-variable settings.

Learning Objectives:

1. To understand the role of excimer light in melanocyte stimulation and its application in surgical vitiligo management.
2. To evaluate the clinical impact of donor site priming on NCECS outcomes.

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Clinical Outcomes of Autologous Melanocyte Transplantation in Segmental Vitiligo, Fitzpatrick Skin Type III

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Introduction: Vitiligo is a chronic depigmenting disorder characterized by the selective loss of melanocytes. Segmental vitiligo is considered a more stable form of the disease and represents an optimal indication for surgical treatment. Autologous melanocyte transplantation has emerged as an effective therapeutic option for inducing repigmentation, particularly in patients with Fitzpatrick skin type III, which is predominant in the Uzbek population.

Case Report: We present a case series of patients aged 10–40 years with segmental vitiligo and Fitzpatrick skin type III. All patients underwent autologous transplantation of non-cultured melanocytes. Biopsy specimens were obtained from normally pigmented skin, viable melanocytes were isolated, and subsequently transplanted onto depigmented lesions. Clinical outcomes were evaluated using standardized before/after clinical photography and the Vitiligo Area Scoring Index (VASI). Follow-up at 2–3 months demonstrated marked repigmentation across facial and acral sites, with a reduction of the VASI index ranging from 50% to 90%, and in selected cases exceeding 95–99%, indicating near-complete repigmentation.

Learning Objectives:

1. To present clinical outcomes of autologous melanocyte transplantation in patients with segmental vitiligo.
2. To demonstrate the application of the Vitiligo Area Scoring Index (VASI) and clinical photography in assessing repigmentation.
3. To highlight treatment results in patients with Fitzpatrick skin type III.

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Trypsinized Split-thickness Grafting: a Novel Technique for Improving Surgical Outcomes in Vitiligo

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Introduction: Conventional surgical techniques for vitiligo, including split-thickness skin grafting, suction blister grafting, and mini-punch grafting, are limited by technical complexity, time consumption, and inconsistent cosmetic outcomes. Achieving a uniformly thin graft remains operator-dependent. This study evaluates a novel technique of trypsinized split-thickness grafting designed to overcome these limitations.

Methods, Results: This prospective case series included 15 patients with stable vitiligo treated using trypsinized split-thickness grafting. A split-thickness graft was harvested and incubated in trypsin solution to facilitate separation at the dermo-epidermal junction. The epidermal graft was then washed with anti-trypsin solution and transplanted onto a dermabraded recipient site. Patients were followed up for 12 months, and repigmentation was graded as excellent (≥90%), good (65–89%), fair (25–64%), and poor (<25%).

Of the 15 patients, 9 achieved excellent repigmentation, while 3 demonstrated good response, and 2 showed a fair response. 1 patient showed a minimal to poor response. Graft uptake was consistent, with uniform pigmentation and minimal textural irregularities. No cobblestoning or significant complications were observed. The patients were followed up for 12 months post procedure, with repigmentation being maintained. The technique allowed predictable harvesting of ultra-thin grafts with reduced procedural variability.

Conclusion: Trypsinized split-thickness grafting is a simple, reproducible, and effective modification that addresses key limitations of conventional grafting techniques in vitiligo. High rates of excellent repigmentation and favorable cosmetic outcomes highlight its potential as a preferred surgical approach in selected patients.

Learning Objectives:

- Understand the technique and rationale of trypsinized split-thickness grafting
- Evaluate clinical outcomes associated with this modified grafting approach
- Incorporate simplified surgical innovations to improve vitiligo treatment outcomes

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Resistent Vitiligo Patches Treated with Fractional Co2 as Add on with Existing Medical Treatment

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Introduction: Vitiligo, a dermatological disorder that leads to depigmented skin patches, presents a significant challenge, particularly in resistant areas such as acral regions. Fractional CO2 laser therapy holds promise as an adjunct to conventional treatment, enhancing repigmentation.

Methods, Results: We selected 30 patients in last 2 years which are considered as slow or poor responding by randomized controlled trials. Most of the lesions are on acral and bony prominence area like shins, malleoli area. The inclusion criteria were as follows: (1) Participants had to be diagnosed with non-segmental vitiligo, (2) At least one acral or treatment-resistant area had to undergo treatment involving a combination of fractional CO2 Laser and conventional therapies, such as topical or oral corticosteroids, topical immune modulators, and phototherapies, (3) Study outcomes had to encompass proportions of re-pigmentation measured in percentages (e.g., ≥ 75%, 75% to 50%, 50% to 25%, and < 25%).The study demonstrated that this combined treatment approach was effective and safe for managing refractory vitiligo on the recalcitent area. Repigmentation rates varied among patients after treatment sessions: 35%patient achieved excellent repigmentation (> 75%), 40%showed moderate repigmentation (25%–50%), and 25% patients exhibited minimal repigmentation (less than 25%). Remarkably, all patients who received laser treatment showed some degree of repigmentation.

Conclusion: The fractional CO2 laser, when combined with conventional therapies, offers a safe and effective treatment option for refractory non-segmental vitiligo.It is vary safe, OPD procdure and positive outcome in most of the cases.Must add treatment in resistent and slow responders.

Learning Objectives:

1. Fractional co2 is an effective,safe and add-on therpy which is safe OPD procedure,
2. By creating MTZ zones which stimilates melanocytes proliferation,migration and enhances absorption of topical treatments,
3. With medical treatments like photherpy(NBVB/Excimer) and topical steroids/immunomodulators or5- FU creams, it boosts repigmentation in resistent patches.

P9: Translational Research

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Study of Interleukin-15 Immunoexpression in the Skin of Vitiligo Patients

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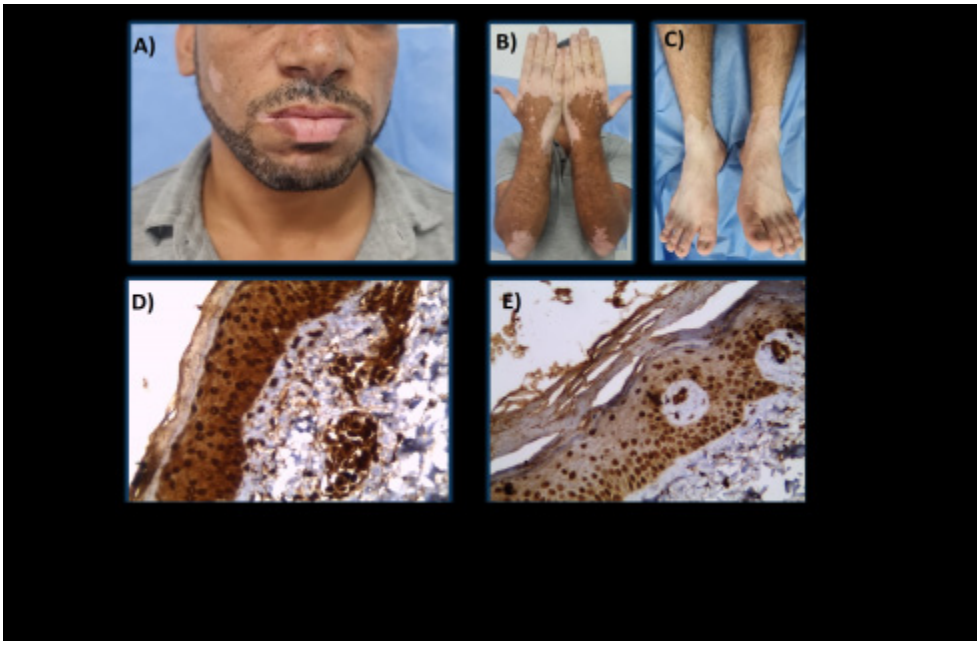
Introduction: Vitiligo is a depigmenting skin disease presented by circumscribed, depigmented macules and patches, triggered by the selective loss of melanocytes. Interleukin 15 (IL-15) promotes survival and maturation of natural killer (NK) cells, neutrophils, and DCs. It potentiates NK cell cytotoxicity and cytokine production, such as interferon-γ (IFN-γ) and tumor necrosis factor (TNF-α5).

Methods, Results: This study was carried out on 24 patients with vitiligo and 24 healthy controls matched for age and sex to assess IL-15 immunostaining in lesional and perilesional vitiligo skin.

In the vitiligo group, the lesional expression of IL15 was 101.0 ± 35.65 a.u., while the perilesional expression was 99.12 ± 40.14 a.u. Both were significantly higher than their expression in the control group (56.63 ± 24.32, $P<0.001$), and both showed significant positive correlations with severity scores, VASI, VETI, and VES, but only lesional IL-15 expression showed a significant correlation with activity.

Conclusion: IL15 skin expression can be a useful biomarker of vitiligo, as it was significantly higher in the skin of vitiligo patients than healthy controls, especially in those with extensive or progressive depigmentation.



Learning Objectives:

to study the immunoexpression of interleukin-15 in the skin of vitiligo patients to figure out its possible role in vitiligo pathogenesis, and uncover its potential to be a future therapeutic target.

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Application of Exposure-Response Modeling to Inform the Phase 3 Dose Selection of Povorcitinib in Nonsegmental Vitiligo

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Introduction: In a phase 2, randomized, dose-ranging study in adults with extensive nonsegmental vitiligo (NCT04818346), once-daily (QD) oral povorcitinib (Janus kinase 1 inhibitor) demonstrated substantial repigmentation without clear dose-response and was well tolerated at 15-, 45-, and 75-mg doses to Week 24 (placebo-controlled) and 45- and 75-mg doses to Week 52 (double-blind extension). Exposure-response modeling was conducted to predict response rates for doses not evaluated in phase 2 and inform povorcitinib dose selection for phase 3 studies.

Methods, Results: The relationships between povorcitinib exposures (steady-state average concentrations) and probability of efficacy, safety, and biomarker outcomes based on observed phase 2 dose-ranging data were quantified using logistic regression models. A population pharmacokinetic model describing the time-course of concentrations following povorcitinib dosing was used to predict exposures for 30 mg QD, which served as input for efficacy and safety outcome predictions. Rates for ≥50% improvement in facial Vitiligo Area Scoring Index (F-VASI50) plateaued at exposures approximating 30 mg QD through Week 24, and Week 24 F-VASI50 correlated with achievement of ≥75% improvement in F-VASI (F-VASI75) at Week 52, the primary endpoint for phase 3 studies. All doses of povorcitinib were generally well tolerated during phase 2, with no dose-related trends for grade ≥3 adverse events. Increasing probability of acne and fatigue was predicted at exposures related to doses >30 mg QD. All doses had biological activity based on changes in biomarkers, though 15-mg povorcitinib QD was comparable to placebo for some biomarkers. The probability of achieving ≥50% decrease in C-X-C motif chemokine ligand 10 (validated vitiligo biomarker) at Week 24 increased with dose, with minimal additional gain observed at doses >30 mg QD.

Conclusion: Based on exposure-response modeling, 30-mg povorcitinib QD, a dose not tested in phase 2, was predicted to optimize the risk–benefit profile and was selected for use in phase 3 vitiligo studies.

Learning Objectives:

- Appreciate that modeling can quantify the relationships between povorcitinib exposure and efficacy, safety, and biomarker outcomes
- Recognize that a dose not evaluated in phase 2 dose-ranging studies can be confidently carried forward into phase 3 supported by exposure-response modeling
- Understand that a dose of 30 mg once daily was predicted to optimize the risk–benefit profile for povorcitinib in vitiligo

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