The analysis of a widely accepted skin type classification system within a real-world inner-city patient population

Windy Cole, DPM, Austin Combs B.S., Pooja Patel B.S., DeAsia Garrett B.S., Nadia Akhtar B.S., Jacob Wielgomas M.A.

Kent State University College of Podiatric Medicine, Independence, OH

Introduction

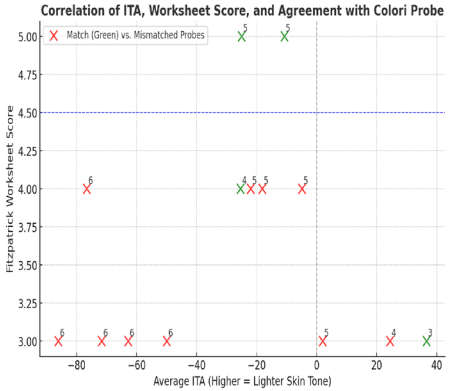
The Fitzpatrick scale, developed in 1975, classifies skin into six phototypes and aids clinicians in assessing infection, inflammation, epithelialization, tissue repair, and scarring, which are critical for treatment and surgical outcomes. However, its limitations in capturing the full diversity of skin tones, particularly in individuals of mixed ethnic backgrounds, can lead to inaccuracies and contribute to healthcare disparities. This study aims to create a new skin pigmentation scale that better reflects skin tone variation in people of color, helping to reduce these disparities.

Literature Review

The Fitzpatrick Skin Phototype Classification System, developed by Dr. Thomas Fitzpatrick in 1975, categorizes skin types based on their response to ultraviolet (UV) radiation.. New technologies, such as the Cortex Colori Probe, provide objective measurements of skin pigmentation, which can enhance the traditional Fitzpatrick scoring. This combination of assessment methods can lead to better personalized care in wound management.

Methods

This single-center, prospective study compares the Fitzpatrick Score with Cortex Colori Probe measurements in current patients at the Cleveland Foot and Ankle Center, an inner-city clinic. Cortex Colori Probe readings were obtained from four body areas: the inner forearm, outer forearm, anterior shin, and dorsum of the foot. These measurements were compared to both patient-reported and investigator-assessed Fitzpatrick scores to identify any similarities or differences. Subjects were consented and cross-referenced to ensure they met the inclusion criteria: age 18 or older, willing to participate, established as a patient at CFAC, and able to give consent. Exclusion criteria included not being an established CFAC patient, inability to consent, or unwillingness to participate.



Results

An interim analysis compared the Fitzpatrick scale of skin phenotypes to the Cortex Colori Probe measurements. A total of 14 subjects were included: 4 African American males, 9 African American females, 1 Caucasian male, and 1 Caucasian female. Patients filled out the Fitzpatrick Skin Type Worksheet to determine their skin type, compared to the average advanced image readings collected by the Cortex Colori Probe. The Fitzpatrick Scale worksheet and average advance image readings are summarized in Table 1. The average ITA of the cohort is -27.839643, -37.573958 for African Americans, and 30.56625 for Caucasians. The modal class of the Fitzpatrick worksheet and Colori Probe scores is 3 and 5, respectively. 50% (7) patients were categorized as 3 from the worksheet and 42.86% (6) from the Colori Probe. Only 25.57% (4) patients had a skin type that matched both. The Fitzpatrick scale worksheet bins skin types V and VI together, while the Colori Probe has separate categories. Of the 4 patients that matched, 50% (2) were matched through the liberal comparison. The Colori Probe is more accurate because it uses numeric data less susceptible to subjective self-reporting.

Contact Information

Windy Cole, DPM
7000 Euclid Ave
Cleveland, Ohio
44103
wcole4@kent.edu

Analysis/Conclusions

The Fitzpatrick scale has limitations in accurately classifying skin phenotypes, especially for diverse skin tones. A comparison of self-reported scores with the objective Cortex Colori Probe showed discrepancies in 74.43% of cases, with the Colori Probe often assigning a type V classification rather than the type III commonly used by the Fitzpatrick scale. In podiatric medicine, accurate skin phenotype assessments are crucial for managing conditions like diabetic foot ulcers and peripheral vascular disease, as skin tone affects treatment responses, infection risk, and scarring. Integrating advanced imaging technologies such as the Cortex Colori Probe can enhance personalized treatment strategies, guide wound management and reduce disparities in care for patients with darker skin. The study's limitations include a small sample size (n=14) and the potential for user error affecting data accuracy. Factors like device placement and environmental conditions also influence measurements. Future research should involve a larger, more diverse sample and standardized procedures while incorporating genetic and ecological data to understand skin phenotypes better. While the Fitzpatrick scale is practical, objective technologies like the Colori Probe can improve skin classification, benefiting podiatric medicine and beyond.

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