may have been prescribed for other indications, by focusing on encounters for acne, the potential for misclassification is reduced. In addition, although some topical retinoid or BPO use may not have been recorded, it is unlikely that this would differ between clinician types. BPO use may also have been underreported in the NAMCS if purchased over the counter. Future studies are needed to identify which interventions are most effective in improving antibiotic stewardship and aligning patient management for acne with consensus guidelines.

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Funding sources: Dr Barbieri is supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health under award number T32-AR-007465 and receives partial salary support through a Pfizer Fellowship grant to the Trustees of the University of Pennsylvania.

Conflicts of interest: Dr Guzman discloses the receipt of travel reimbursement from Verrica Pharmaceuticals, consulting fees from Cello Health, and advisory board participation with Janssen.

IRB approval status: Institutional Review Board approval was not required because all research activities were performed using publicly available deidentified information.

Reprints not available from the authors.

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https://doi.org/10.1016/j.jaad.2020.06.044

Raster-scanning optoacoustic mesoscopy imaging as an objective disease severity tool in atopic dermatitis patients

To the Editor: Accurate assessment of disease severity in atopic dermatitis (AD) is important in monitoring response to treatment and guiding subsequent management. Current disease severity markers have limitations. Eczema Area Severity Index and Scoring AD (SCORAD) are observer dependent,[1] whereas skin biopsies are invasive. Recent studies have described the role of imaging in assessing AD severity, including optical coherence tomography (OCT).[2] This study evaluates the feasibility of raster-scanning optoacoustic mesoscopy (RSOM) imaging as an objective disease severity tool for atopic dermatitis. RSOM imaging involves the detection of ultrasound waves generated in response to pulsed light illumination. Light absorbed by melanin results in thermoelastic expansion, producing ultrasound waves that are then detected by transducers and reconstructed to form a 3-dimensional image.[3]

This prospective study included 69 patients with AD and 22 healthy volunteers. All patients with AD were assessed by a dermatologist, and all participants had RSOM imaging using RSOM Explorer C50 system (iThera Medical, Munich, Germany). From the RSOM images generated, epidermis thickness, total blood volume, vessel diameter in the dermis, and the ratio of low- and high-frequency signals (LHFR) in the dermis were computed (Supplemental Fig 1, available at https://data.mendeley.com/datasets/2k96hrcgnm/1). We trained a linear kernel-based support vector machine model for eczema classification using epidermis thickness, total blood volume, and LHFR. A novel Eczema Vascular and Structural Index (EVSI) was formulated to assess eczema severity (Supplemental Methods, available at https://data.mendeley.com/datasets/2k96hrcgnm/1).

This study cohort consisted of 24 female subjects (26.4%), and a majority (95.2%) were of Fitzpatrick skin types III-IV (Supplemental Table I, available at https://data.mendeley.com/datasets/2k96hrcgnm/1). Sixty-nine patients with AD had SCORAD measured:

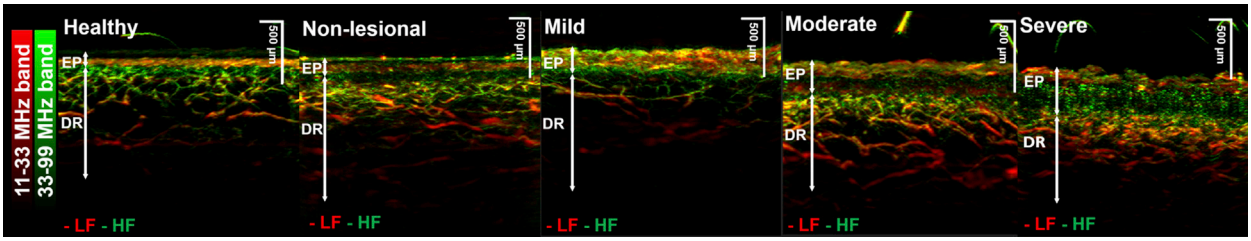

Fig 1. Raster-scanning optoacoustic mesoscopy (RSOM) images of healthy and eczematous skin and quantitative analysis of specific metrics for varying atopic dermatitis severity. Representative cross-sectional RSOM images of varying eczema severities with the vertical white lines indicating the epidermal (EP) and dermal (DR) skin regions with the low-frequency (LF) band in red and the high-frequency (HF) band in green. The capillary loops extend from the epidermis and can be seen as the "dot"-like structures in the moderate and severe images. There were 91 subjects with healthy controls (n = 22) and patients with nonlesional patches of eczema (n = 69; mild, n = 26; moderate, n = 33; severe, n = 10). All scale bars = 500 μm.

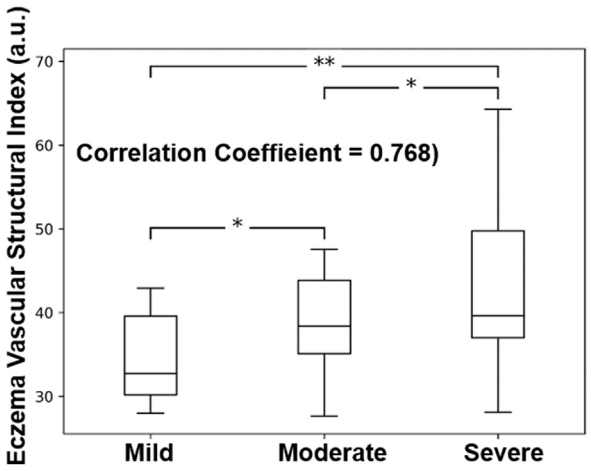

Fig 2. Eczema severity classified by Eczema Vascular and Structural Index (EVSI) corresponds with patients' clinical SCORAD scores (<25 = mild; 25-50 = moderate; >50 = severe), with a Pearson correlation coefficient of 0.768. The median value of EVSI in the moderate group was approximately 17% higher than that in the mild group ($P < .05$), the value in the severe group was approximately 5% higher than that in the moderate group ($P < .05$), and the value in the severe group was approximately 24% higher than that in the mild group ($P < .01$).

26 patients had mild AD, 33 patients had moderate AD, and 10 patients had severe AD.

RSOM cross-sectional images of healthy and AD subjects (mild, moderate, severe) showed significant differences (Fig 1). The resultant EVSI could accurately differentiate between healthy and eczematous skin (Supplemental Fig 2, available at https://data.mendeley.com/datasets/2k96hrcgnm/1) and between the different severities, with at least $P < .05$. The Pearson correlation coefficient between EVSI and SCORAD was 0.768 (Fig 2). The receiver operating characteristic curve of the EVSI-based classification showed a solid evaluation of the trained model with an area under the curve of 0.921, accuracy of 0.872, and high sensitivity and specificity values of 0.853 and 0.838, respectively (Supplemental Fig 3, available at https://data.mendeley.com/datasets/2k96hrcgnm/1).

The strengths of RSOM-derived EVSI are that it is objective, it has a short turn-around time, and it allows for repeated noninvasive measurements. Compared with optical coherence tomography, which has poor lateral resolution owing to light scattering, RSOM detects ultrasound waves, allowing for clearer distinction of vascular structures and the epidermal-dermal junction.[3,4]

One limitation of this study is that all subjects are of Asian descent, and RSOM images are affected by the melanin content present. However, our previous study showed that melanin signal intensity derived from RSOM exhibited an excellent correlation with that obtained from a clinical colorimeter for subjects of varying skin phenotypes; therefore, specific imaging metrics could be derived.[3] Moreover, direct histopathologic and RSOM imaging correlation has been demonstrated previously.[4]

RSOM provides a direct and objective assessment of the skin ultrastructures in a noninvasive manner, and this could be valuable in assessing AD severity.

The authors thank Dr Yi Qiu and Dr Katja Haedicke (iThera Medical GmbH) for their help in analyzing the RSOM images.

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*Funding sources: National Medical Research Council (NMRC) project, OFIRG 18 Nov-0101, and Biomedical Research Council (BMRC), A*STAR, Singapore, for the intramural funding support for some aspects of this study.*

Conflicts of interest: Dr Ntziachristos has equity ownership and is an advisory board member of iThera Medical. Drs Yew, Dinish, Kuan, Li, Dev, Attia, Bi, Moothanchery, Balasundaram, Aguirre, Ntziachristos, Olivo, and Thng have no conflicts of interest to declare.

IRB approval: This study was sanctioned by the Domain Specific Review Board (DSRB) of National Health Group, Singapore (Ref No. 2017/00932).

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https://doi.org/10.1016/j.jaad.2020.06.045

Cross-sectional evaluation of the pediatric baseline series in detection of contact sensitization in children

To the Editor: The first expert consensus-derived pediatric baseline series (PBS) was published in 2018 for detection of pediatric allergic contact dermatitis (ACD) in the United States.[1] Previously, only the US Food and Drug Administration–approved Thin-Layered Rapid Use Epicutaneous (TRUE) Test (Smart Practice, Phoenix, AZ) was recommend for use in children age 6 to 17 years.[2] Using data collected from the Prospective Pediatric Contact Dermatitis Registry, we evaluated the ability of the PBS to diagnose pediatric ACD compared with the TRUE Test.

Patch test results of children (age 0-17 years) from the Massachusetts General Hospital (MGH), Brigham and Women's Hospital (BWH), and the University of Missouri between January 2016 and March 2020 were entered into an online registry housed at MGH. Children were tested to extended baseline series containing allergens in the PBS and TRUE Test. A previously described method to evaluate the hypothetical positive patch test (PPT) yield of the TRUE Test and PBS was used.[3] The number of patients who would have had all of their PPTs detected using allergens in the TRUE Test or PBS were compared (Fig 1).

One hundred and eight children (MGH, 63; BWH, 7; Missouri, 38) were tested; there were 44 boys (40.7%) and 64 girls (59.3%). The mean (±SD) age was 9.5 ± 4.7 years. Eighty-one patients (75%) had ≥1 PPT; 39.5% (32/81) would have had all of their PPTs detected by the PBS compared with 18.5% (15/81) by the TRUE Test ($P < .01$). If tested only with the PBS, 13.6% of subjects (11/81) would not have had any of their potential allergens detected compared with 18.5% (15/81) with the TRUE Test alone ($P = .39$). When stratified by age, the PBS was significantly better than the TRUE Test in the ability to detect all PPTs in children 6-12 years old ($P = .02$). The hypothetical yield to detect all PPTs was greater for the PBS than the TRUE test in children 0-5 and 13-17 years old, although there was no statistical difference. This is potentially attributed to the smaller sample sizes in these age groups. The top 50 allergens eliciting a PPT among our cohort is shown in Table I.

Hydroperoxides of linalool and limonene were among the most commonly identified allergens in our cohort (23.1% and 9.6% of patients, respectively), but they were not components of the PBS or TRUE Test. Hydroperoxides of linalool and limonene are emerging sensitizers in children, and fragrance