



Non-invasive Detection of Subclinical Skin Changes in Lymphedema

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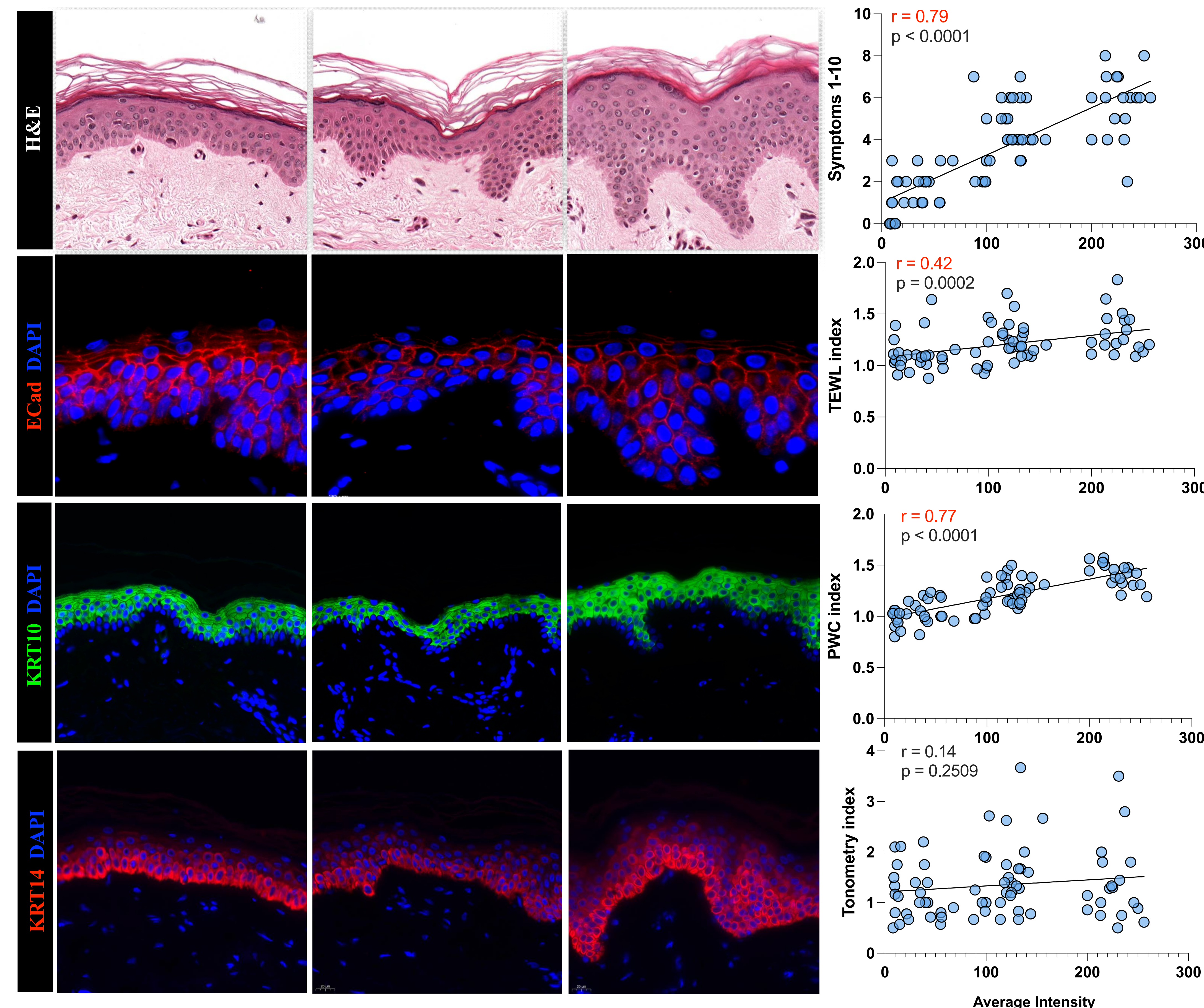
Purpose:

- Current diagnostic measures for lymphedema are limited in detecting subclinical disease.
- The purpose of this study was to quantify early skin-changes in lymphedematous skin and evaluate their correlation with indocyanine-green (ICG) lymphography findings and patient-reported symptoms.

Methods:

- Trans-epidermal-water-loss (TEWL), tonometry (fibrosis), and percentage-water-content (PWC) were prospectively measured under ICG lymphography
- Both dermal backflow areas and areas not impacted by dermal backflow were assessed using three non-invasive devices.
- Matched biopsies were collected and analyzed using histology and immunofluorescence.

Results:



Conclusions:

- Early-stage lymphedema is characterized by a localized increase in tissue water-content, fibrosis, and skin-barrier dysfunction.
- These changes are highly correlated with patient symptoms.
- This is the first study to show that early detection of localized skin changes using simple, non-invasive methods applicable for clinical adaptation, is a promising tool in the screening of subclinical-lymphedema.