Analysis of the influence of the body region on the characterization of skin aging by high-frequency ultrasound

Poster ID
NT_159

Ricci Leonardi, Gislaine; Massufero Vergilio, Mariane; Moretti Aiello, Laura; Arandas Monteiro e Silva, Silas.
University of Campinas (UNICAMP), SP, Brazil.

Introduction:

High-frequency ultrasound (HFUS) skin imaging analysis is a non-invasive technique that allows a unique approach to the analysis of the skin and its layers [1], [2]. Furthermore, it allows a new level of evaluation of the efficacy of dermatological and cosmetic products, especially for rejuvenation of the skin [2]. In this context, the purpose of this study was to determine the best body region to perform the characterization of skin aging through the skin image analysis method of 50 MHz HFUS.

Materials & Methods:

1 Experimental design

Open comparative randomized controlled clinical trial.
Approved by the Research Ethics Committee number 4.148.842.

38 women with visible signs of facial aging, between 35 and 60 years.

30 min acclimatization in a climate-controlled room.

20 ± 2°C 55 ± 5%

Parameters were measured by a trained operator in a site measure 3.0 cm of diameter on the right or left volar forearm of the research subjects.

2 Image analysis using high-frequency ultrasound

The images was obtained using 50 MHz HFUS device. The parameters of skin echogenicity, thickness, and surface roughness were evaluated according to Vergilio *et al.* (2021) [1].

3 Statistical analysis

- The sonographic images were analyzed by two independent researchers.
- Friedman's test followed by Dunn's posthoc test (α=0.05).

Results & Discussion:

Table I. Groups characterization.

	Group A	Group B
Skin photoaging level	Mild	Moderate or advanced
Sample number	18	20
Mean age ± SD	45 ± 5	60 ± 5
Glogau classification	Typo II	Typo III and IV
Fitzpatrick phototype	39% phototype III, 50% phototype IV and 11% phototype V.	10% phototype II, 20% phototype III, 60% phototype IV and 10% phototype V.

Results & Discussion:

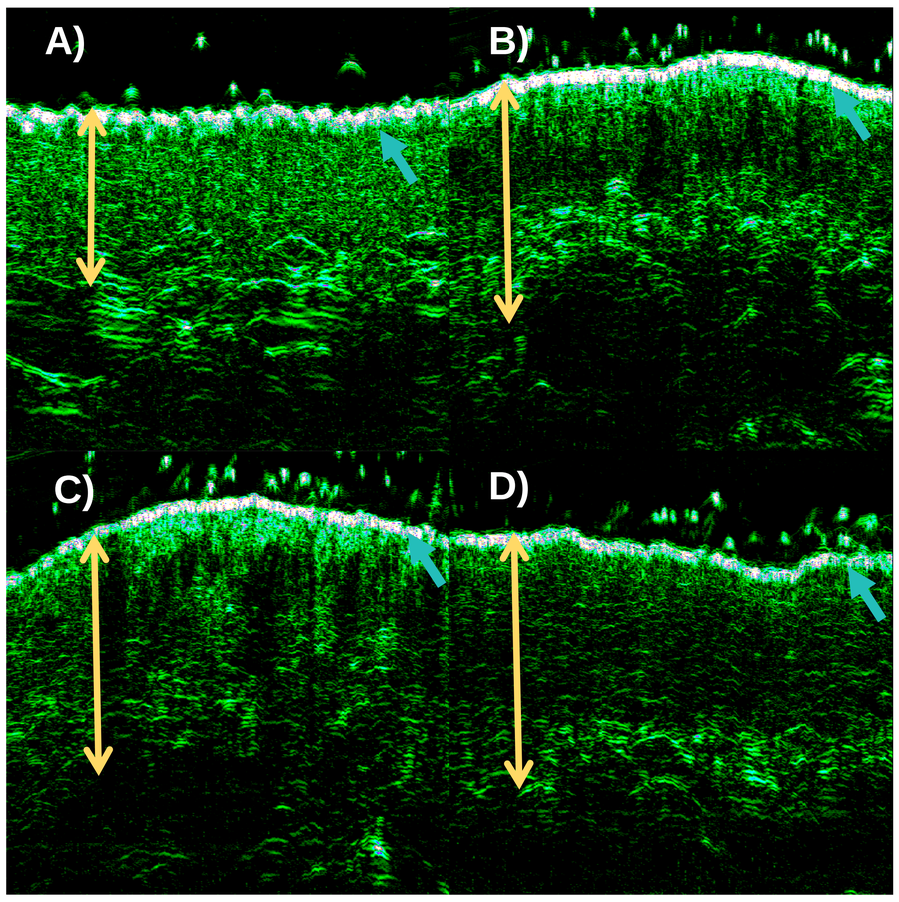

Figure 1. HFUS images of the participant P19 (real age = 40 years and apparent age = 38 years) showing the changes according to the body sites evaluated. The yellow arrows indicate different total skin thicknesses for each site and the green arrows indicate the difference in thickness of the epidermis according to the sites studied (A = forearm; B = forehead; C = zygomatic; and D = nasolabial).

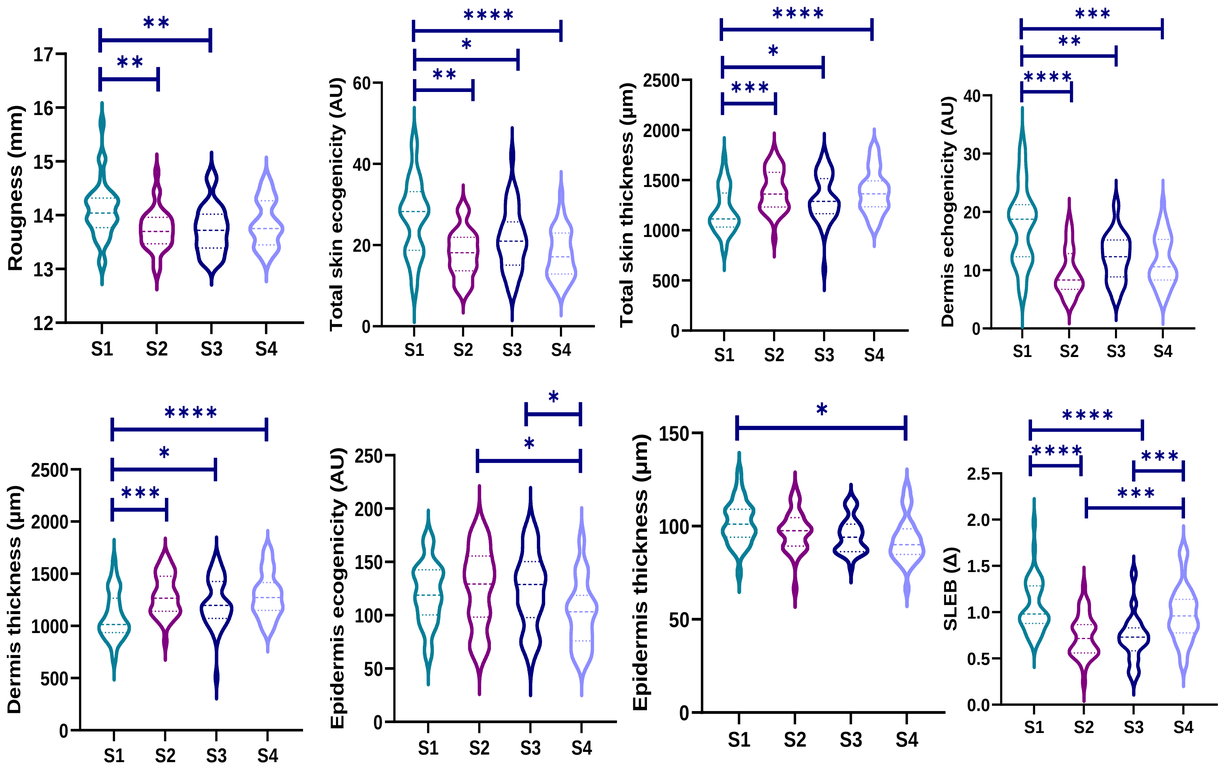

Figure 2. Graphical representation (violin plot) of the comparative analysis of the analysis sites for each calculated parameter. The values that proved different are indicated with asterisk p-value < 0.05 (*), p-value < 0.005 (**), p-value < 0.001 (***), p-value < 0.0001 (****).

Conclusions:

The data obtained in this study suggest that to assess aging, the forearm body region would be more interesting as a test site.

Aknowledgments:

São Paulo Research Foundation (FAPESP—2018/06973-4) and Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior (CAPES)—Finance Code 0001.

References:

1.Vergilio MM, Monteiro e Silva SA, Jales RM, Leonardi GR. High-frequency ultrasound as a scientific tool for skin imaging analysis. Exp Dermatol. 2021;30(7):897–910.
2. Vergilio MM, Vasques LI, Leonardi GR. Characterization of skin aging through high-frequency ultrasound imaging as a technique for evaluating the effectiveness of anti-aging products and procedures: A review. Ski Res Technol. 2021;00:1–8.