



Comparison of two conventional methods for diagnosing sensitive skin

SS_618

Hyein, Ham; Jihwoon Baek; Jaesook, Koh*
Dermapro Skin Research Center, DERMAPRO Ltd., Seoul, Korea.

Introduction:

There is a growing demand for cosmetics targeted at sensitive skin. Accordingly, studies analyzing the diagnosis and evaluation of sensitive skin are also needed. Despite extensive studies, no clear understanding of sensitive skin exists. Sensitive skin is characterized by extensive reaction to the external environment, and is not a specific disease. Symptoms of sensitive skin include itching, burning, stinging and tight sensation. Although no signs of objective irritation exist in most cases, it is marked by occasional erythema, dryness or rash.

We used two diagnostic methods for the classification of sensitive skin. Following a classification the groups based on lactic acid stinging tests, we compared the subjects' skin characteristics. Using the questionnaire method designed by Leslie Baumann, M.D., we also classified and compared the skin characteristics of the sensitive groups.

Materials & Methods:

Four hundred thirty-four healthy Korean adults who met the inclusion and exclusion criteria participated in this study. All subjects signed written agreements to comply with the study protocol and were assigned a unique number. This human study conducted according to the intent and purpose of Good Clinical Practices and/or the Declaration of Helsinki, as appropriate. The study was carried out from May 2018 to June 2019 under controlled environmental conditions. The ambient temperature was maintained at 20~24°C and the relative humidity was maintained in the range of 45%~55%.

Hydration, Trans Epidermal Water Loss (TEWL), Sebum output level, pH, elasticity, wrinkle parameters, pores, brightness and color (L^* , a^* , b^* and ITA° value) of facial skin were measured.

The skin sensitivity was evaluated using the lactic acid sting test and Baumann skin type questionnaire. In the lactic acid sting test, 5% aqueous solution of lactic acid (50 μ L) was randomly applied on each nasolabial fold and distilled water was used on the other side. The Baumann skin type questionnaire (part two, sensitive vs. resistant) was used to evaluate the subjects' response about sensitive skin. All data were expressed as mean \pm standard deviation (SD). Statistical analysis was performed by independent t-test and one-way ANOVA using the SPSS version 11.5 (SPSS Inc., USA). P -values < 0.05 were considered statistically significant.

Results & Discussion:

Based on the results of 5% lactic acid stinging test, subjects with an average value of 0 were classified into non-stinger group and those with 1 or more into a stinger group to analyze their skin characteristics. As a result of analysis the skin characteristics, the parameters that showed significant differences between the two groups were skin hydration, TEWL, pH and b^* values (Fig 1). In particular, hydration, TEWL, and pH revealed the skin barrier condition. Previous studies also suggested that changes in skin barrier function trigger symptoms of sensitive skin, and increased permeability of stratum corneum was related to abnormal skin barrier function. According to the above results, the lactic acid sting test represents an appropriate diagnostic method for sensitive skin due to reduced function of the skin barrier.

As a result of Baumann skin type questionnaire (part two, sensitive vs. resistant), subjects were classified into 4 groups: 'very sensitive skin' (VS), 'somewhat sensitive skin' (SS), 'somewhat resistant skin' (SR) and very resistant skin' (VR).

References:

1. Kligman AM, Sadiq I, Zhen Y, Crosby M. (2006) Experimental studies on the nature of sensitive skin. *Skin Res Technol*; 12: 217-222.
2. Saint-Martory, C., Roguedas-Contios, A.M., Sibaud, V., Degouy, A., Schmitt, A.M., Misery, L. (2008) Sensitive skin is not limited to the face. *Br. J. Dermatol.* 158, 130-133.
3. Yokota, T., Matsumoto, M., Sakamaki, T. et al. (2003) Classification of sensitive skin and development of a treatment system appropriate for each group. *IFSCC Magazine*. 6, 303-307.
4. Berardesca E, Farage M, Maibach H. (2013) Sensitive skin: an overview. *Int J Cosmet Sci*; 35: 2-8.
5. Leslie Baumann, M.D. (2010) THE SKIN TYPE SOLUTION. BANTAM BOOKS,
6. A.Pons-Guiraud. (2004) Sensitive skin: a complex and multifactorial syndrome. *J Cosmet Dermatol*, 3, 145-148

As a result of analysis the skin characteristics, the parameters that showed significant differences between the groups were elasticity (R2), wrinkle, pore, brightness, b^* and ITA° value. Also, we found that the more sensitive the group was, the younger it was (Fig 2). We confirmed that the more sensitive group showed higher levels of elasticity (R2), brightness and ITA° value, and lower wrinkle, pore and b^* values. These parameters represent the primary factors of skin ageing and used to evaluate the changes of skin according to age. According to the above results, the younger group tended to respond more sensitively to the questionnaire.

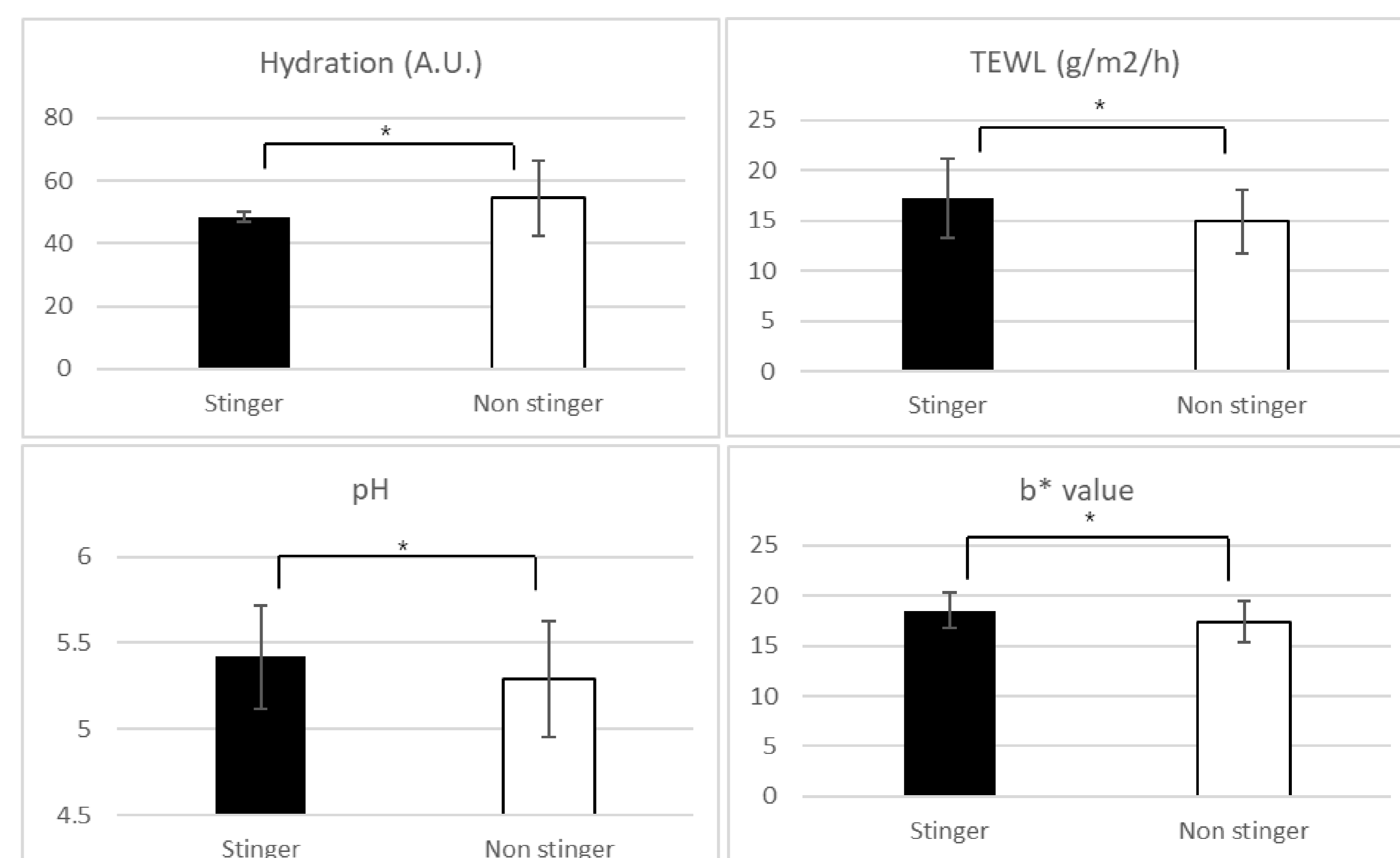


Fig. 1. Skin hydration, TEWL, pH and b^* values showed significant differences between stinger and non-stinger groups (*Statistically significantly difference: $P < 0.05$)

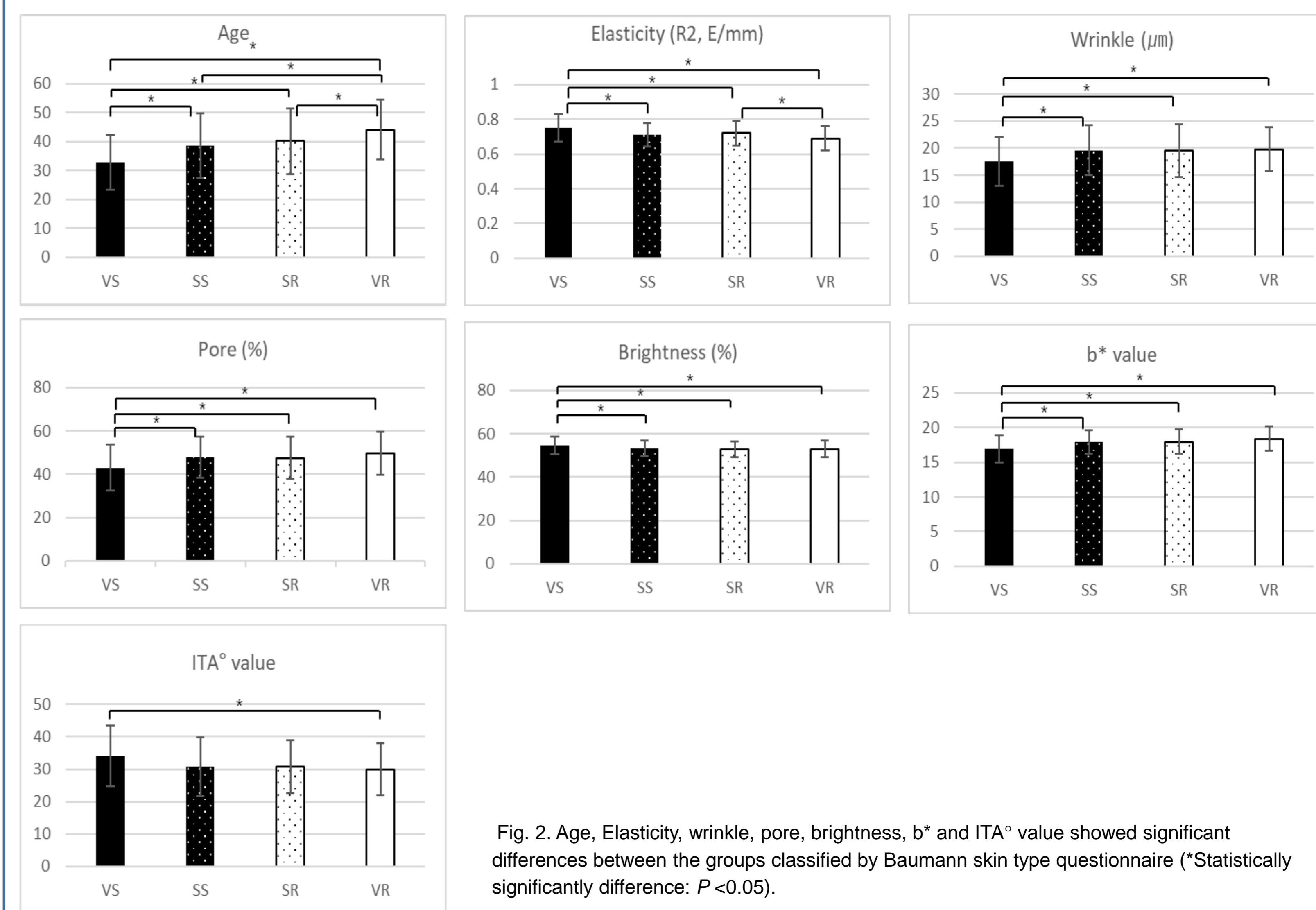


Fig. 2. Age, Elasticity, wrinkle, pore, brightness, b^* and ITA° value showed significant differences between the groups classified by Baumann skin type questionnaire (*Statistically significantly difference: $P < 0.05$).

Conclusions:

Lactic acid sting test was found to be a suitable method for selecting sensitive skin with lowered skin barrier function. As a result of classifying sensitive skin using the questionnaire, the more sensitive skin, the younger it was. It also showed significant differences between groups in parameters representing aging.