

Development of new cosmetic clinical assessment based on skin measurement data according to age of Korean women.

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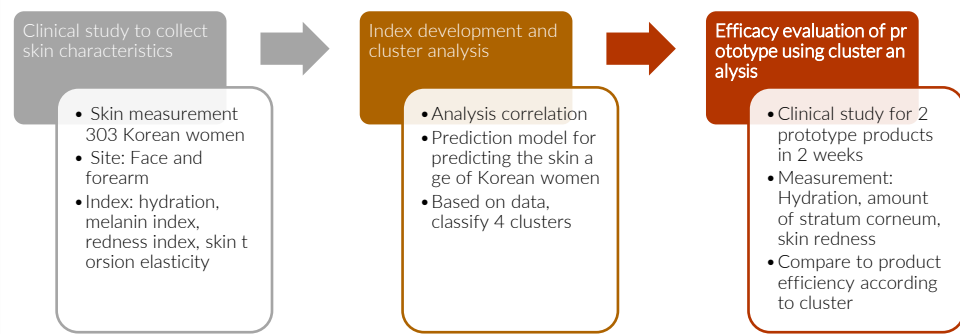
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Introduction:

Skin properties can be classified in terms of several specific features such as wrinkles, surface roughness, texture, pores and hyperpigmentation, which have been measured and quantified by a variety of imaging techniques. Such methods are widely used in assessing the efficacy in evaluating the condition of the skin in clinical research. Skin characteristics are not limited to grasping individual skin but can be used for research by classifying people with common skin characteristics. In addition, the accumulated skin characteristic data can be used to build skin diagnosis data, which can be used for diagnostic analysis to select cosmetics suitable for one's skin. The most popular classification criterion for skin classification is the Baumann skin type. [1] The Baumann skin type evaluates the presence or absence of dry/oily, pigmented/non-pigmented, sensitive/resistant, and wrinkle-prone/tight using a questionnaire, and classifies them into 16 types so that the person's skin can be grasped. [1] The Baumann skin type is widely used around the world and there are various studies related to it. [2-3] In addition, the Oilskin Self-Assessment Scale (OSSAS) and the Oilskin self-image questionnaire (OSSIQ) are used as scales for grasping skin types. [4] They are associated with the subject's skin measurement elements based on a questionnaire and provide criteria for people to choose cosmetics. In this study, a new skin index and cluster analysis was performed for Korean women by analyzing the correlation between skin characteristics data and ages as well as comparing skin characteristics. In addition, the results were compared by conducting to clinical study using the prototype product for 2 weeks.

Materials & Methods:



Results & Discussion (1) :

[Results of measurement of skin characteristics for Korean women of ages]

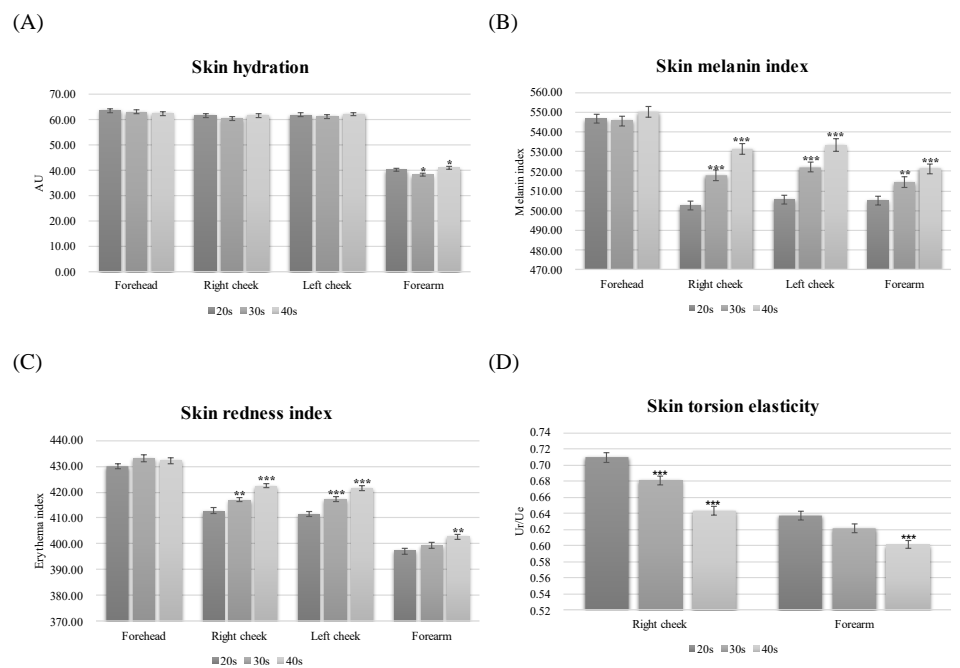


Figure 1. Results of skin characteristics measurement by age group in 20s ~ 40s from data of 303 people(average ± standard error) 20s vs. 30s vs. 40s, Mann-Whitney U analysis. Significant: **p* < 0.05, ***p* < 0.01, ****p* < 0.001, (A) Skin hydration, (B) Skin melanin index, (C) Skin redness index, (D) Skin torsion elasticity.

Conclusions:

This study goes beyond a simple large-scale skin characteristic study to create new indicators and groups through correlation analysis, regression analysis, and cluster analysis. It has the advantage of providing additional data along with the device measurement results by checking the indicators during the human application test. In addition, the new skin index can be used in conjunction with other skin indexes (eg, aging index), and it is considered that additional research is needed in that it can be used in big data if the data is continuously expanded.

Acknowledgements:

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References:

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Results & Discussion (2) :

[Development of an age prediction model using basic skin characteristics and results of cluster characteristics]

Table 1. . Results of regression analysis on basic skin characteristics and age of 303 peoples.

Dependent Variable	Independent variable	Unstandardized Coefficients(B)	Std. Error	Standardized Coefficients(β)	t	Sig.	VIF
Ages	(Constant)	-70.659	17.509		-4.036	<.001	
	Melanin_Left	.049	.036	.164	1.354	.177	7.586
	Melanin_Right	.014	.035	.049	.407	.685	7.477
	Redness_Left	.166	.072	.198	2.300	.022	3.806
	Redness_Right	.100	.075	.117	1.334	.183	3.929
	Ur/Ue_Face	-56.732	6.630	-.397	-8.556	<.001	1.106

Ages = -70.659 + 0.049(Melanin_Left) + 0.014(Melanin_Right) + 0.166(Redness_Left) + 0.100(Redness_Right) + -56.732(Ur/Ue_Face)
 R² = 0.422, Adjusted R² = 0.412, F = 43.404, p < 0.001, Durbin-Watson = 0.885

Table 2. Skin characteristics according to classification according to cluster analysis and questionnaire by cluster.

Cluster	Number of people	Mainly Affected Skin Characteristics	Representative features through survey answers			
			Skin type	T-zone	U-zone	Skin topic (Top 3)
1	102	Torsion elasticity	Combination skin	Dry skin	Normal to dry skin	Skin trouble (pimple) Blemishes (freckles/pigmentation) Pore (Blackhead)
2	74	Skin melanin	Normal to dry skin	Normal to oily skin	Normal to dry skin	Dry skin Blemishes (freckles/pigmentation) Pore (Blackhead)
3	94	Skin redness	Combination skin	Normal to dry skin	Dry skin	Dry skin Blemishes (freckles/pigmentation) Pore (Blackhead)
4	33	Skin melanin	Normal to dry skin	Oily skin	Dry skin	Dry skin Blemishes (freckles/pigmentation) Skin wrinkles (Deep wrinkles around the eyes or face)

[Clinical study of prototype products using cluster analysis based on skin characteristic index]

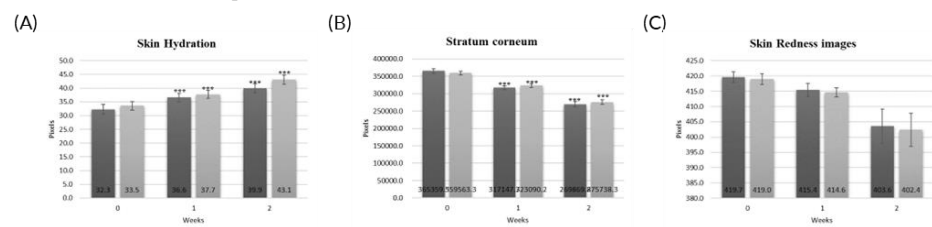


Figure 2. Results of clinical study after 2 weeks of use of two prototype products. 0 week vs. 1 week, 2 weeks, Paired t-test, Significant: ****p* < 0.001. (A) Skin hydration, (B) Stratum corneum, (C) Skin redness.

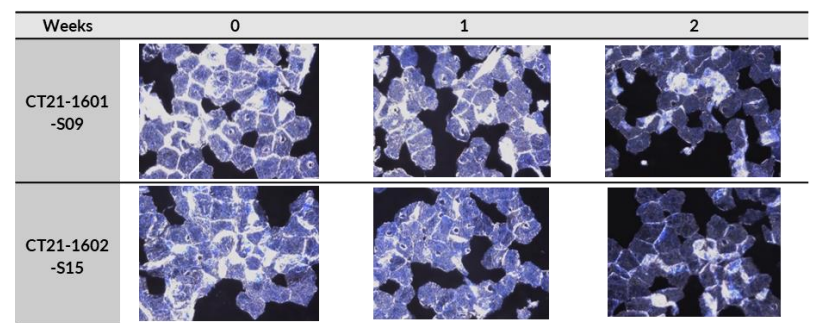


Figure 3. Representative image for stratum corneum using two prototype products

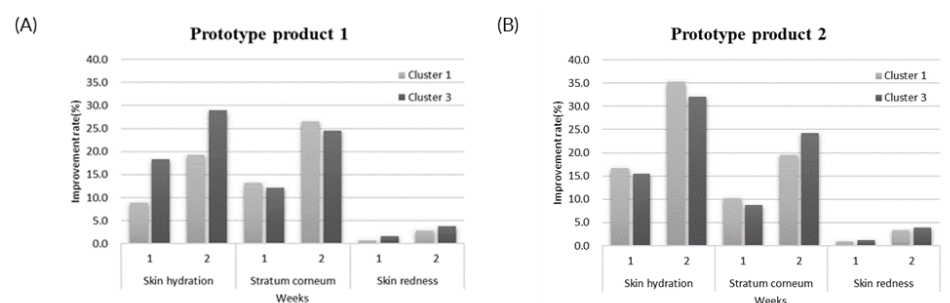


Figure 4. Results of checking the skin improvement of the cluster 1 and cluster 3 subjects in the two types of test products. Cluster 1 vs. Cluster 3, Independent t test or Mann-Whitney U analysis, no significant. Prototype product 1, Prototype product 2.