

Effect of Glucosyl Sphingolipids Derived from Rice on Human Skin Condition

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Abstract

We conducted a 6-week double-blind comparison study of sphingoglycolipid (oryza ceramide) obtained from rice to placebo with 33 testers with dry skin and declining keratin moisture levels, and got the following conclusion. In the moisture measurement, oryza ceramide specially makes the skin's moisture increase. In addition, from the result of 3-D image analysis of epidermis with a microscope, we found that the skin's smoothness, scale and texture were improved. These results show that continuing taking oryza ceramide is useful in keeping skin's water and smoothness and is the raw material to keep skin healthy.

Introduction

Ceramide exists as the key intercellular lipid of the skin's keratin layer and glucose ceramide exists as the intercellular lipid of the granular layer. They play important roles in forming and stabilizing the construction of the Lamellae in the outermost layer of skin (literature 1,2). The synthesized ceramides have been widely used as raw materials in cosmetics, however, from the viewpoint of safety, development of plant ceramide from rice as food raw material has been widely promoted. Our company is the world's leader in using oryza ceramide as food material, it is the sphingoglycolipid (oryza ceramide) extracted and refined from rice bran products, and oryza comes from the academic name of rice. In recent years, the effect of improving skin barrier function in the hairless mouse and the colon cancer inhibition effect have been reported as the biological activity of the oryza ceramide, but in this paper, we will introduce ceramide developed from some companies' plant and its effect on the human skin. As the skin's vaporation and moisture are greatly affected by the environmental factors, in our evaluation, in addition to the diagnosis of dermatologists, we used the 3-D skin surface analysis instrument (VISIOSCAN) adopting then newest telescope to objectively and scientifically evaluate the condition of the skin surface.

Skin Beautifying Test Using Humans as Testers

The test is a double-blind test of taking 6 weeks of oryza ceramide-containing food and placebo.

1) Testers

All testers satisfy the condition of "is normally of dry skin slowly declining skin moisture and is worried about skin becoming coarse but has not taken medical products like medicines and

coating agents”. From the joined testers (46 people), we excluded those with moisture larger than 50% in their moisture measurement of their skins just below the left eye and used the remaining 33 people as testers. We randomly separated them into oryza ceramide taking group (ceramide group, 17 testers) and placebo taking group (16 testers). We determined that every tester did not take medicine as the test started and no one was under medical treatment .

Table 1 Changes of moisture, pH and oil content before and after taking oryza ceramide

		ceramide group (n=17)		
		before taking	after 3 weeks	after 6 weeks
Moisture	below left eye	43.2 ± 5.5	48.0 ± 14.3	52.2 ± 12.1 **
	left upper wrist	37.0 ± 5.6	41.1 ± 11.0	43.2 ± 35.7 **
	neck/back part	43.5 ± 10.8	51.2 ± 11.7 **	55.9 ± 11.1 **
Acidity (pH)	below left eye	5.8 ± 0.7	5.6 ± 0.6	5.8 ± 0.5
	left upper wrist	5.5 ± 0.5	5.5 ± 0.6	5.8 ± 0.5
	neck/back part	5.9 ± 1.1	5.5 ± 0.5	5.4 ± 0.4
Oil Content	below left eye	42.3 ± 34.8	49.9 ± 35.1	38.1 ± 25.9

		placebo group (n=16)		
		before taking	after 3 weeks	after 6 weeks
Moisture	below left eye	43.4 ± 5.4	43.2 ± 9.2	41.7 ± 9.4
	left upper wrist	35.7 ± 5.6	37.7 ± 7.0	35.7 ± 9.0
	neck/back part	49.1 ± 8.8	51.0 ± 10.4	56.1 ± 20.5
Acidity (pH)	below left eye	5.9 ± 0.8	5.8 ± 0.6	5.9 ± 0.7
	left upper wrist	5.5 ± 1.0	5.6 ± 0.8	5.9 ± 0.5
	neck/back part	5.9 ± 0.8	5.5 ± 0.5	5.8 ± 0.4
Oil Content	below left eye	58.4 ± 55.8	29.5 ± 22.0	40.8 ± 33.3

* : p<0.05, ** : p<0.01

For all values, the averages and derivations are listed.

2) Test goods and its taking period

Taking two soft capsules (20 mg each) containing oryza ceramide (“ceramide” hereafter, 1.2 mg sphingolipid produced from rice) daily. Also, preparing similar soft capsules having the same appearance and taste (no odor) as the ceramide and taking them as placebo. The taking period are both six weeks.

3) Checking days and checking method

As a principle, checking was done right before starting taking, 3 weeks after taking and right after ending taking (6 weeks after taking). The moisture was measured using Corneometer CM825 (Courage + Khazaka Electronic GmbH, the following measurement instruments were from the same manufacturers). Oil content was measured using Sebumeter SM810, and acidity was measured using pH900. The parts of 1cm below the left eye, the inner side of the left upper wrist (3 cm above the elbow), and back (3 cm below the neck's spiculate protuberance) were taken as the measurement parts. VISIOSCAN was used in the 3-D skin surface analysis with telescope.

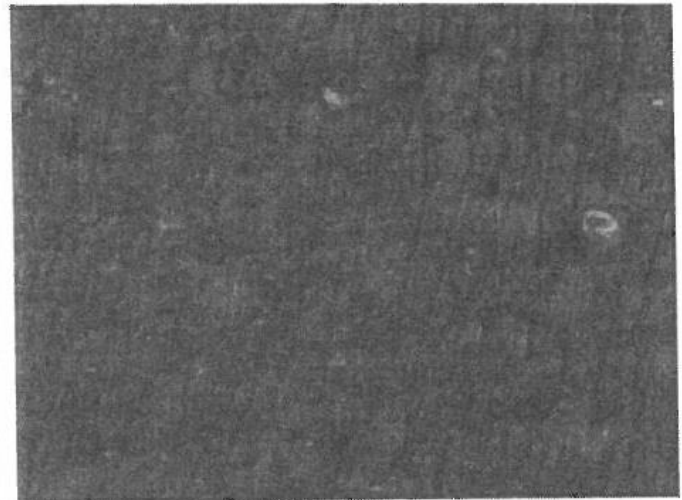
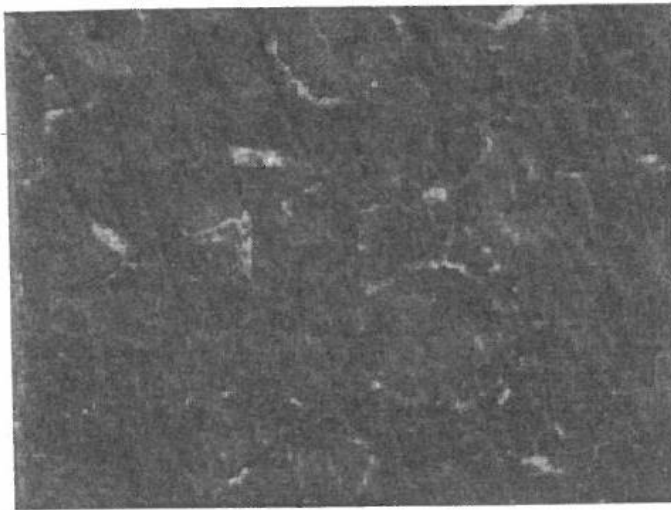
4) Results

(1) Moisture, oil content, and acidity

Table 1 shows the changes of moisture, oil content, and acidity for two groups. In terms of moisture, in contrast to the placebo group having no significant changes, the ceramide group showed significant increase in moisture in the back part after three weeks and significant increase in moisture in all the three measured parts after 6 weeks. In terms of acidity, no significant change was found in the two groups. In terms of oil content, as it was 0 except the part below the left eye, we excluded the measurement of the left upper wrist part and the neck/back part for the second time. No significant change was found in the part below the left eye between the two groups.

(2) Analysis results with VISIOSCAN

Table 2 shows the changes of the parameters' values. Kurtosis is the skin's smoothness, and significant improvement was found in the back part in the ceramide group. SEsm value is the cortex's smoothness calculated from the wrinkles' depth, width and cutting, and significant improvement was found in the back part in the ceramide group, indicating that the skin's smoothness was recovered. Then in SEr (a parameter indicating skin's coarseness), significant improvements were found in the part below the left eye and the back part in the ceramide group by comparing them 6 weeks after taking and before taking. Also, in SEsc (a parameter indicating the driness of cortical keratin), significant improvements were found in every parts in the ceramide group, the driness of cortical keratin was mitigated and scales decreased. In SEw (numbers and broadness of wrinkles of skin), significant improvement was found in the part below the left eye after three weeks in the ceramide group, no otherwise significant change was found. The figure shows the images of a member (23 years old, the part below the left eye) from the ceramide group before taking and after 6 weeks of taking. We know that after taking, moisture increases, the driness of cerebral cortex is mitigated, and wrinkle become shallow. The above results show that foods having oryza ceramide have the effects of alleviating the dryness of skin and improving the conditions of the cerebral cortex for dry skins.



before taking oryza ceramide

after 6 weeks of taking oryza ceramide

Figure Comparison of images of the part below the left eye before and after taking oryza ceramide (23 years old, female)

Table 2 Parameters measured with VISIOSCAN before and after taking oryza ceramide

		ceramide group			placebo group		
		before taking	after 3 weeks	after 6 weeks	before taking	after 3 weeks	after 6 weeks
Kuriosis (ideal value: 0)	below left eye	0.33	0.37	0.35	0.39	0.38	0.38
	left upper wrist	0.35	0.39	0.40	0.43	0.43	0.40
	neck/back part	0.40	0.40	0.30 *	0.40	0.40	0.40
SEsm (ideal value: low value)	below left eye	377.4	364.4	342.1	368.0	354.1	347.7
	left upper wrist	339.4	304.8	308.5	326.1	317.3	334.2
	neck/back part	386.8	327.8 *	333.1 *	355.2	349.2	354.5
SEr (ideal value: low value)	below left eye	0.29	0.26	0.25 *	0.30	0.31	0.30
	left upper wrist	0.26	0.20	0.16 *	0.31	0.26	0.25
	neck/back part	0.18	0.15	0.14 *	0.31	0.30	0.30
SEsc (ideal value: low value)	below left eye	49.6	47.6 *	46.8 *	46.6	46.8	46.6
	left upper wrist	48.9	47.9 *	47.6 *	48.3	48.9	48.4

	neck/back part	46.1	44.5 *	42.9 *	46.4	46.9	46.4
SEw	below left eye	36.1	32.3 *	33.9	36.0	33.0	35.5
	(ideal value: low value) left upper wrist	26.7	24.7	27.1	27.5	24.5	27.7
	neck/back part	28.4	24.7	26.1	28.2	25.9	30.6

For all values, the averages are listed. * : $p < 0.05$

Conclusion

The test introduced above was done using double-blind test. Although ignored in the paper, according to the testers and the doctors, placebo group taking capsules having no oryza ceramide also improved. However, in the analysis using VISIOSCAN, no significant change was found in the placebo group, and significant differences existed in the effects of oryza ceramide and placebo. We conclude that this deeply indicates: that oryza ceramide has the effects of preventing the dryness and coarseness of skin has been scientifically shown.

Literature

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