

MICROCURRENT SKIN TREATMENT OUTPERFORMS A STANDARD RETINOL TOPICAL IN THE TREATMENT OF CELLULITE SKIN TOPOGRAPHY

D.G. Kern¹, Z.D. Draelos², R. Gopaul¹, J. Lephart¹, H.E. Knaggs¹
¹Center for Anti-Aging Research, Nu Skin Enterprises, Inc., Provo, Utah, United States;
²Dermatology Consulting Services, Inc., High Point, North Carolina, United States

BACKGROUND

Cellulite, found in most post-pubertal women and located on many body area, is perceived as uneven, lumpy textured skin best viewed with side lighting of the affected area. It has been described as an “orange peel” or “cottage cheese” skin appearance made more prominent by squeezing the skin. The etiology of cellulite is unknown, yet modern theories include genetic predisposition (1,2), vascular insufficiency (3,4,5), changes in lipid metabolism, and structural changes in the extracellular matrix (ECM) (6,7). Products containing retinol have been promoted for use in improving the appearance of cellulite by primarily supporting the structure of the ECM. Reported in literature and used commonly in aesthetic spas, microcurrent treatment of the skin using an electrically-conductive priming gel with skin care products (8) is seen as an alternative for improving cellulite appearance. This double blind study compared a retinol-containing topical product to commercially-available microcurrent spa-equivalent skin care regimens for cellulite appearance improvement.

OBJECTIVE

To understand the ability of two cellulite-targeted microcurrent skin care regimens to improve the appearance of cellulite as compared to a market leader retinol cream.

METHODS & MATERIALS

STUDY DESIGN:

In a double blind clinical study, one retinol-containing cream and two microcurrent regimens (Table 1), employing different topical formulations, were tested over 12 weeks with 20 subjects in each of three study arms. Four common areas of cellulite involvement (posterior upper thigh, abdomen, ventral upper arm, and neck) were graded by clinician, subject self-assessment, and girth measurements. Cellulite was defined as visible dimpling of the skin without the presence of shadows from deep cutaneous indentations. No manipulation of the skin appearance through pinching was allowed to create a dimpled appearance. Lack of body firmness and lack of lifting were defined as sagging skin over the anatomic area. Following study entry, subjects were asked to complete an entry questionnaire. At the baseline visit, subjects were weighed and photographed. Both the subject and the dermatologist primary investigator completed a questionnaire detailing the appearance of the cellulite at weeks one, four, eight, and 12 weeks. Thigh circumference and weight were measured at baseline and at weeks four, eight, and 12.

TARGET SITES FOR EVALUATION:

Digital photography and evaluations were conducted of the following target sites:

1. Left posterior upper thigh below the buttock
2. Lower abdomen centered around the umbilicus at 90 degrees
3. Lower abdomen centered around the umbilicus at 45 degrees to the left
4. Outstretched left underarm
5. Central neck at 90 degrees and a frontal view

STUDY REGIMENS:

RETINOL REGIMEN: Typically, cosmetic formulations contain a retinol concentration of 0.1 – 0.5% w/w with an informal limit of 1.0% w/w where irritation and safety become a concern. A market-leading retinol-based cosmetic product was selected as a benchmark control for this study. To reduce initial irritation, the retinol cream was used once daily every other day for the first week and once daily for the second week. Thereafter, the retinol cream was used twice daily.

REGIMEN W/ PRODUCT A: Once daily, three times per week, a conductive topical gel product was applied to clean skin using a microcurrent instrument delivering 375 uA for five minutes. Immediately following removal of excess residual gel, treatment Product A was applied (Table 1). On the other four days when microcurrent was not applied, only topical treatment Product A was applied twice daily.

REGIMEN W/ PRODUCT B: Once daily, three times per week, a conductive topical gel product was applied to clean skin using a microcurrent instrument delivering 375 uA for five minutes. Immediately following removal of excess residual gel, treatment Product B was applied (Table 1). On the other four days when microcurrent was not applied, only topical treatment Product B was applied twice daily.

RESULTS

Data from clinicial grading and subject self-assessment was analyzed by comparing change from baseline between treatment groups and longitudinally for each treatment, allowing each subject to serve as their own historical control. For simplicity, only the comparisons that were statistically significant are presented in Table 2. Photos representative of the study results are shown.

Overall, both microcurrent spa-equivalent treatments Product A and Product B outperformed the retinol cream product. Additionally, although one microcurrent spa-equivalent treatment employed elevated levels of highly skin-targeted active ingredients (Product A), both microcurrent treatments were substantially equivalent, suggesting that a significant proportion of the improvement in the appearance of cellulite was derived independent of the topical treatment formulation used. No statistically significant changes in subjects’ overall body weight were detected during the course of this study, eliminating weight loss as a cause of cellulite reduction.

DISCUSSION

Cellulite is widely thought to be a skin appearance created by the structural organization of the subcutaneous compartment underlying the dermis. Ultrasound has convincingly shown herniations of subcutaneous tissue into the dermis in persons afflicted with cellulite. Retinoids are thought to improve the amount and structure of collagen, thereby improving the appearance of cellulite (Figure 1).

It has been shown that there is approximately a 35% decrease in blood flow in areas affected by cellulite compared with unaffected areas (9). Microcurrent treatment may enhance vascular, lymphatic, and intercellular fluid movement, allowing for reduced fluid retention and increased nutrient supply supporting remodeling. Further, the transmission of the microcurrent into the skin is enhanced by the conductive gel that also moisturizes the skin, improving texture and feel. This may explain the statistically significant improvement in cellulite appearance seen with the microcurrent/gel treatment arms as compared to the retinol cream alone.

CONCLUSION

This pilot study demonstrated the statistically significant ability of a microcurrent spa-equivalent and conductive gel to improve the appearance of cellulite more than a retinol cream. Further work will need to be done to better characterize the effects of microcurrent on skin structure and adipose tissue.

TARGET	TOPICAL A	TOPICAL B
Fluid Movement	Coleus Barbatous Root Extract	Ilex Paraguariensis Leaf Extract
Skin Structure	Xymenynic Acid Tocopherol Equol Manilkara Multinervis Leaf Extract Retinol Glucosamine HCL Pisum Sativum (Pea) Extract Bambusa Vulgaris Leaf/Stem Extract	Honey (Mel) Extract, Palmitoyl Oligopeptide, Echinacea Purpurea Extract, Algae Extract
Hydration	Caprylic Capric Triglyceride Pentylene Glycol Cyclopentasiloxane Cyclohexasiloxane	Cyclomethicone Sodium Hyaluronate, Aloe Barbadensis Leaf Juice
Lipid Metabolism	Coleus Barbatous Root Extract	Hibiscus Rosa-Sinensis Extract, Hibiscus Abelmoschuus (Malvaceae) Extract, Ilex Paraguariensis Leaf Extract

TABLE 1. Formulation ingredients targeting four of the primary contributors to the development of cellulite.

Comparison of three regimens for improving the appearance of cellulite											
Test Materials	Study Arm #	Abdomen—lower		Upper Arm—underside		Neck—front		Overall Cellulite—rear upper thigh		Thigh Circumference	
		Attributes Measured: firming, lifting, smoothing, slimming, overall appearance	Long.	Attributes Measured: firming, lifting, smoothing, slimming, overall appearance	Long.	Attributes Measured: firming, lifting, smoothing, slimming, overall appearance	Long.	Attributes Measured: extent, depth, overall, surface texture, firming, lifting, smoothing, slimming, overall appearance	Long.	Attribute Measured: circumference around thigh 6 inches below trochanteric head	Long.
Retinol-containing Product	1	X:3 (1/8)	X (4/8/12)	X:3 (8)	X (8)					X (1/4/8/12)	
Microcurrent Treatment w/ Topical Regimen A	2	X:1 (8/12)	X (4/8)		X (8/12)	X:1 (8/12)	X (4/8/12)			X (4/8/12)	
Microcurrent Treatment w/ Topical Regimen B	3	X:1 (8/12)	X (8/12)		X (8/12)	X (8/12)	X (8/12)	X:1 (8)		X (4/8/12)	
Notation Code	Black font:	Investigator Assessment									
	Blue font:	Subject Self Assessment									

TABLE 2. Summary of study data in notation format. For example, for the notation X:3 (1/12), X:3 denotes that for at least one attribute measured, the study arm where the notation is given is statistically significant at weeks one and 12 when compared to study arm #3.

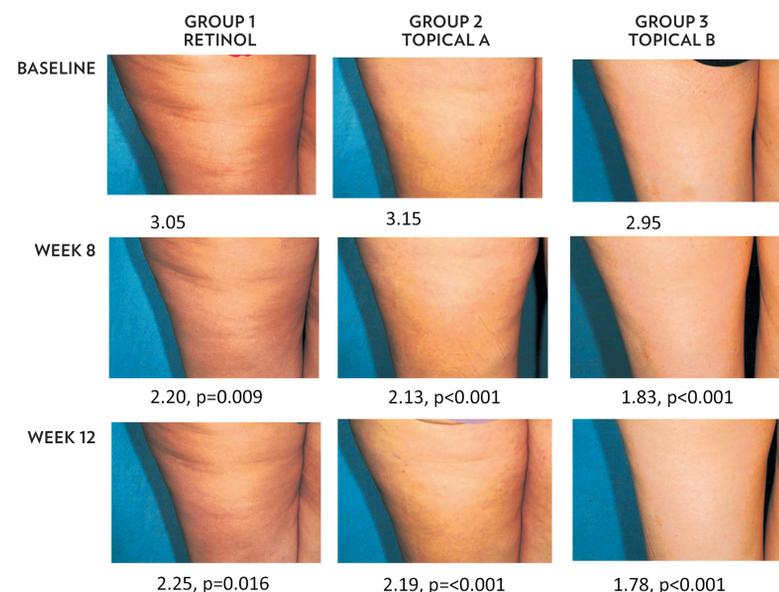


FIGURE 1. Representative photographs of improvement in skin texture and topography for retinol, Product A and Product B over 12 weeks of treatment. Shown is left posterior upper thigh below the buttock.

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