Research Article

Evaluation of skin elasticity after used different seaweed containing products by DermaLab® Combo

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Abstract

Objective: This particular study aims to investigate the effect of different local antiageing products on the barrier function of normal skin, as measured by quality of skin elasticity. **Methods:** The elasticity probe of DermaLab® Combo Series assesses the effectiveness of three local anti-aging products by measuring the pressure needed for the suction pump to elevate skin. In this study, 15 female volunteers were divided into three groups, which corresponded with three different brands of moisturizers. The volunteers were treated with one test preparation on one volar forearm twice daily for 4 weeks, while leaving the other forearm untreated to serve as the control. After 4 weeks, both volar forearms, treated and control, were assessed for the measurement of skin elasticity by using DermaLab® Combo, and the readings were compared to the baseline. **Results:** Brand B shows the greatest percent increase in skin elasticity with the value of 96.44%, followed by Brand C (95.16%) and Brand A (39.02%). The result implies that Brand B gives the best anti-aging effect to the consumers regardless of subject compliance. This is relatively acceptable since the difference in percentage increase of skin elasticity between the highest reading and the lowest reading is near to each other except for Subject B1. The result portrayed by Subject B1 reflects his compliance problem during product application phase as mentioned during final skin assessment. In case of Brand C, a large gap is seen between the highest (468.8%) and the lowest (-26.5%) percentage increase in skin elasticity. **Conclusions:** The application of seaweed-containing antiaging products leads to improvement in skin elasticity as measured by DermaLab® Combo Series.

***Keywords*:** DermaLab®, Skin, Elasticity, Seaweed, Anti ageing

Introduction

Today, herbal medicines are growing popular not only in Asian countries but also in other countries as well (Azad et al., 2012a, 2012b, 2013, 2015). A cosmetic composition is disclosed for applying to skin. The composition includes a liquid and dispersed in the liquid: any amount or form of fucoidan, any amount or form of beta glucan; and any amount of a marine extract (Azad et al., 2016a). When the cosmetic composition is applied to the skin, the appearance of the skin is improved (Athwal, 2011). The skin is one of the largest organs in the body. Skin is comprised of three main layers: the epidermis, the dermis and subcutaneous layers. At the outermost part of the epidermis, a layer of dead cells forms what is known as a stratum corneum layer. The dermis is the middle layer of skin and is comprised of arrangements of collagen fibres, which surround many specialized cells and structures (Athwal, 2014). The innermost layer of the skin is the subcutaneous layer, often called the sub-dermis. The subcutaneous layer is comprised largely of fat and connective tissue and houses larger blood vessels and nerves. Elastin may be found in all layers of the skin, but is most prominent in the dermis layer. The condition and appearance is a major concern to most people. Enhancing the appearance of the skin is of significant interest for many people (Athwal, 2015). The appearance of the skin can be affected by many sources including environmental conditions such as sun exposure, building heating and air

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conditioning, and air pollution can accelerate deterioration of the condition and appearance of skin. Additionally, certain diseases can affect the appearance of the skin. Deterioration of the appearance of the skin may include, but is not limited to, wrinkles, loss of firmness and elasticity of the skin, age spots, discolorations, and dryness. In addition, individual factors such as diet, stress, age and genetics may affect the appearance of the skin (Gankande et al., 2014). The elasticity probe of DermaLab® Combo Series assesses the effectiveness of three local anti-aging products by measuring the pressure needed for the suction pump to elevate skin. This non-invasive method has been used in various skin tests including that of scar and burned skin assessment. It has been proven by various papers in its reliability with excellent reproducing capacity (Azad et al 2015, Athwal, 2014). Similarly, the video-scope probe of DermaLab® Combo Series that is made use for qualitative assessment of depth and rough amount of fine wrinkles, it has been accepted as a reliable skin evaluator world-wide.

Materials and methods

In this current study, inclusion and exclusion criteria was followed by Azad et al., (2012). The study is designed as an open phase study, planned to be implemented on April 2015 over a period of 4 weeks, and is expected to complete during May 2015. Basically, 15 participants are expected to take part in the study. The participants are selected from both male and female students of Kulliyyah of Pharmacy, with a condition of non-antioxidant-cosmetic user. Apart from that, they have to be motorcyclists or frequent drivers to create the condition of aged skin due to excessive exposure to UV radiation (Azad et al., 2016b).

This study was considered as an in vivo study due to human participants (Fahim et al., 2015). The participants will be divided into three groups consisting of five people. Each group will be given different brands of cream to be applied on the back of the hand. They are ought to apply the product at least once or two times per day depending on feasibility. Participants are not allowed to apply any other cosmetics on the site of application throughout the experiment. Before that, they have to undergo basal skin assessment for the reason of setting skin basal line condition (Azad et al., 2016c). The assessment of skin condition using DermaLab® Combo Series is done on every one or two weeks depending on condition (Wan et al., 2016). Basically, an elasticity probe is placed against the back of the hand of participants and vacuum is applied approximately 10 mm to a reproducible level. The values ranged between 2 to 15 MPa (mega Pascals). The higher MPa values indicate that a higher vacuum strength is needed to lift the skin, which reflects a better firmness of skin. The participants also will be assessed on their visual skin condition using video-scope probe. The video-scope is an electronic video microscope with 20-50X magnification. The probe provides high quality close-up images of skin conditions, which will be captured and stored in digital form. The result then will be compared to the baseline and classified as effective or not effective.

Name and details of products

NUTOX Anti-ageing Cream

(Tested & proven from years of continuous research to provide remarkable results and able to visibly reduce signs of ageing). Water, Cyclopentasiloxane, Dimethiconol, Dimethicone Crosspolymer, Isopropyl Isostearate, Tapioca Starch, Polymethylsilsequioxane, Avena Sativa (Oat) Kernel Extract, ***Undaria pinnatifida*** **Extract (seaweed),** Phenyl Trimethicone, Ammonium Acrylolyl dimethyl taurate/VP Copolymer, Hydrogenated Soybean Oil, Tremella Fuciformis (Mushroom) Extract, PEG-40 Hydrogenated Castor Oil, Titanium Dioxide, Allantoin, Fragrance, Sodium Polyacrylate, C18-21 Alkane,

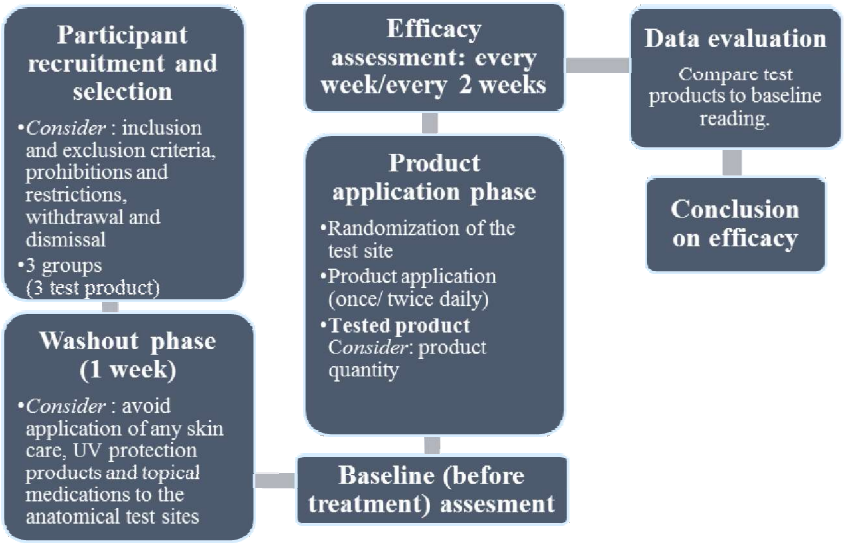

Figure 1. Flow chart of test assesment

Trideceth-6, Propanediol, Evodia Rutaecarpa Fruit Extract, Swiftlet Nest extract, Artemesia Capillaris Flower Extract, Actinidia Polygama Fruit Extract, Butylene Glycol, Magnesium Gluconate, **Algae Extract,** Cichoim Intybus (Chicory) Root Extract, Maltose, Cyclomethicone, Propylene Glycol, Lecithin, Alcohol Denat., Disodium Phosphate, Tocopherol, Citric Acid, Ascorbic Acid, Caprylic/ Capric Triglyceride, Ascorbyl Palmitate, Disodium EDTA, Phenoxyethanol, Ethyl hexyl glycerin, Tetrasodium EDTA.

Eversoft Skinz™ Youth Recall Hydra Glow Firming Cream SPF30 PA++

(claimed to be tested dermatologicallyand clinically proven). Water, Isohexadecane, Glycerin, Etylhexyl Methoxycinnamate, Cyclopentasiloxane, Niacinamide, Titanium Dioxide, Butylene Glycol, Arachidyl Glucoside, Ethylhexyl Triazone, Cyclohexasiloxane, Triethylhexanoin, Methylene B is-Benzotriazolyl Tetramethylbutylphenol, PPG-3 Myristyl Ether, Octocrylene, B is-E thylhexyloxyphenol Methoxyphenyl Triazine, Dimethicone Crosspolymer, Dimethicone/Vinyl Dimethicone Crosspolymer, Maltooligosyl Glucoside, Methyl Methacrylate Crosspolymer, Glyceryl Stearate, PEG-100 Stearate, Hydroxyethyl Acrylate/Sodium Acryloyldimethyl Taurate Copolymer, Hydrogenated Starch Hydrolysate, Stearic Acid, Carnosine, Carbomer, Aminomethyl Propanol, Disodium EDTA, Citric Acid, Sodium Hyaluronate, Palmitoyl Tripeptide-5, ***Undaria pinnatifida*** **(Wakame seaweed) Extract,** Prunus Mume (ume) Fruit Extract, Fragrance, Methylparaben, Methylisothiazolinone.

Irisé Antiage Revitalising Crème

Deionised Water, C12-C15 Alkyl Benzoate, Glycerin, ***Undaria pinnatifida*** **Extract,** Hydrogenated Polydecene, Sodium Polyacrylate, C18-C21 Alkane, Trideceth-6, Saccharide Isomerate, Acetyl Hexapeptide-8, Pentapeptide-3, Malus Domestica Fruit cell Culture Extract, Xanthan Gum, Lecithin, Tocopheryl Acetate, Plukenetia Volubilis Seed Oil, Ammonium Acryloy ldimethyl taurate/VP Copolymer, Allantoin, Disodium EDTA, Fragrance, Phenyoxy ethanol, Ethyl hexyl glycerin.

Table 1. Consumable usage

Pre-treatment test			
Type of probe	Number of subjects	Number of reading taken/ subject	Total times of usage
Elasticity	15	3	45
Video scope	25	3	45
Post-treatment test			
Type of probe	Number of subjects	Number of reading taken/ subject	Total times of usage
Elasticity	15	3	45
Video scope	15	3	45
TOTAL			180

The methodology framework is adapted from Darlenskiet et al., (2013) and simplified into a chart as follow

Results

From the table of average result, it shows that Brand B shows the greatest percent increase in skin elasticity with the value of 96.44%, followed by Brand C (95.16%) and Brand A (39.02%). The result implies that Brand B gives the best anti-aging effect to the consumers regardless of subject compliance. This is relatively acceptable since the difference in percentage increase of skin elasticity between the highest reading and the lowest reading is near to each other except for Subject B1. The result portrayed by Subject B1 reflects his compliance problem during product application phase as mentioned during final skin assessment.

In case of Brand C, a large gap is seen between the highest (468.8%) and the lowest (-26.5%) percentage increase in skin elasticity. This incident is believed to be contributed to the difference in compliance to product application by subjects as reported during final skin assessment. The biggest contributing factors to the negative effect on skin elasticity include inability of subject to retain the product on skin test site for the time given as well as improper method and amount of product applied to the test site. Further research should focus on giving proper and adequate training on importance of following correct product application to ensure such problem would not arise again.

Percent increase in skin elasticity produced in subjects applying Brand A is considered acceptable since the difference between the highest and the lowest reading is relatively moderate with the highest reading 289.5% and the lowest is 9.4%.

Discussion

Viewing on the qualitative assessment of skin aging, almost all products depicts excellent improvement in reducing the depth and rough number of fine wrinkles on the test site (Gankande et al., 2014). This result Compared to the initial skin assessment, the skin shows impressive betterment in skin elasticity and firmness, captured by video-scope probe by DermaLab® Combo Series as well as from subjects' testimonies. Out of the three groups, subjects from group B (use Brand B) testify the most throughout the phase of skin application. This finding is found to be similar with respect to the quantitative evidence showing percent increase in skin elasticity.

On the second weeks of product application phase, two subjects, each form Brand B and Brand C users have developed skin rashes after product application. The rashes are believed to arise from subject's allergy to any of the

products' ingredients. Identification of allergy-induce ingredient and level of skin erythema are not done for the time being due to time constraint. Consultation with supervisor leads to the final decision of stop using the product. However, the skin elasticity reading is still taken and made use in the final result report.

Based on the results, it can be said that all three seaweed-containing antiaging products possess antiaging effects in line with the product claim (Christ et al., 2008). Besides, the application of seaweed-containing antiaging products leads to improvement in skin elasticity as measured by DermaLab® Combo Series. However, proper caution should be taken in case of product application to avoid inaccurate result. Further research should try to scout for older population, increase duration of study or inculcate healthy nutrition and hydration to improve the accuracy and reliability of results.

Conclusion

DermaLab® Combo Series is a non-invasive skin evaluation device that requires less training of skills in order to use it efficiently. Local seaweed-containing antiaging products (NUTOX Anti-ageing Cream, Eversoft Skinz™ Youth Recall Hydra Glow Firming Cream SPF30 PA++ and Irisé Antiage Revitalising Crème) show considerably positive effects in giving of skin firmness, improving skin elasticity and reduction of fine wrinkles regardless of age.

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Conflict of interest

All authors have declared no conflict of interest.

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