

The effectiveness of l-ascorbic acid and retinol in the treatment of skin



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Abstract

This report shows a trail of Retinol and L-Ascorbic Acid on the skin of 63 participants. It gives a comprehensive description of how the two chemical would to participants. The objectives that were determined in the clinical trial included the impact of the chemicals on the skin texture and consistency, the effects on pigmentation, the effects on fine lines, the effects on skin moisture content and the effects in skin surface texture (pores, roughness etc.). It was also noted down as to whether each chemical has some side effects such as stinging on initial application and Erythema. The method that was used in the trial was the application Retinol and L-Ascorbic separate sides of the face was applied both am and pm. The results showed that L-Ascorbic acid had a slight improvement on the skin pigmentation while Retinol showed no effect on skin pigmentation but yielded positive results in the texture and more comfortable. The L-Ascorbic acid was discovered that the participants experienced acne lesions and skin dryness. The conclusions that the participants are more enjoy use Retinol rather than L-Ascorbic Acid.

Introduction

L-Ascorbic Acid is a type of chemical compound that is found in Vitamin C. Due to its association with Vitamin C, the compound has similar oxidizing properties as Vitamin C. L-Ascorbic Acid also exist in isomerism with other compounds that make up the Vitamin. The only difference between the L-Ascorbic Acid and other chemical compounds that make up Vitamin C is the interchange of different chemical elements that make up the compound (Baumann 2009, p. 25). This variation in molecular structure results to

difference in the reaction/chemical properties of the distinct forms of Vitamin C. Vitamin C being an active oxidizing agent, it is very important in the application of compounds used in skin pigmentation. However, different forms of the Vitamin have distinct penetration levels of the dermis layer of the skin. This implies that different constituents of Vitamin C have distinct properties on the skin pigmentation attributes. Over the years, scientists have been working on finding the most stable form of vitamin C that will be suitable in the colourization of the skin. It has been found out that L-Ascorbic Acid is the only form of Vitamin C that has the ability to produce profound skin decolourization. According to Counsell and Hornig (2011), the correct amount of application of L-Ascorbic Acid on the skin can produce the correct pigment that is desired thus giving it an important purpose in the medical industry.

On the other hand, Retinol also known as Vitamin A is a chemical compound that mostly used in anti-aging products. Retinol reacts to the skin by shedding off the dead skins cells on the upper epidermal layer.

Consequently, the cells beneath are encouraged to grow and multiply. This phenomenon creates a new layer of fresh cells that give the skin a striking pigmentation and a smooth texture. Vitamin A is widely applied in the medical field particularly in Dermatology for this unique property. It is predominantly used in anti-aging skin care products applied during facial treatments (Farris 2014, p. 67).

In this experiment, two chemical products namely L-Ascorbic Acid and Retinol were applied to the skin of participants and the results were collected for analysis. L-Ascorbic Acid was applied on right side of the participant's

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face while Retinol was spread on the left side. The effects of the reaction of the two chemicals were recorded and data analyzed as to which of the two chemical compounds was suitable in providing the skin with the best-intended pigmentation, fine line, moisture content and surface texture.

Methods

There are 63 participants (Non-randomised group, all female students/one male studying Unit 2. 4 Cosmeceutical Science) aged 18 to 50 years old. The participants will be provided two topical antioxidants applied to facial skin in a split-face fashion for a six-week period. Application of Retinol on the left and L-Ascorbic Acid on the right side of the face both am and pm. Prior to application, ensure skin has been cleansed thoroughly. The participants should not use other products with active ingredients during the six-week trial period. Their mixture would interfere with the results that would be produced.

Results

From the trial, the following data was recorded;

Results For L-Ascorbic Acid

Perception	Rating
Criteria	
Product	5% Too
texture	heavy
and	52%

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consistenc

y (How Comfortabl
 does it e
 feel on 43% Too
 your light
 skin?)

32% No
 change
 63% Slight

Effects of improvem
 pigmentat ent
 ion 5%
 Significant
 improvem
 ent

Effects on 67% No
 fine lines change
 32% Slight
 improvem
 ent
 1%
 Significant
 improvem

ent
 35% No
 change
 62% Slight
 Effects on
 skin
 moisture
 content
 3%
 Significant
 improvem
 ent

25% No
 change
 Effects in
 skin
 surface
 texture
 (pores,
 roughness
 etc.)
 62% Slight
 improvem
 ent
 13%
 Significant
 improvem
 ent

Side
 effects:
 stinging
 57% None
 38% Mild

with initial

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applicatio
n 5%
Uncomfort
able

89% None

Side 6% Mild
effects:
erythema 3%
Uncomfort
able

Other side effects:

✦ 3 participants
reported an increase
in acne lesions

✦ 3 yellowing of
fingers

✦ 1 participant
reported mild
erythema

✦ 1 congestion

✦ 3 participants
reported an increase
in skin dryness

✦ 1 oxidation,
blocked pores

Comments:

Product consistency is
very light, individuals
with dry skin may
need to use a heavy
moisturiser to
compensate.

✦ 6 too light, dry
skin

✦ 5 skin texture
improved, softened

✦ 4
inappropriate for oily
skin type

✦ 4 unpleasant
sticky, applies
unevenly

✦ 3
improvement in PIHP

✦ 4 unpleasant

odour

Results For Retinol

Perception

Rating

Criteria

Product

texture

6% Too

and

heavy

consistenc

79%

y (How

Comfortabl

does it

e

feel on

15% Too

your

light

skin?)

76% No

change

24% Slight

Effects of

improvem

pigmentat

ent

ion

0%

Significant

improvem

ent

74% No
change

27% Slight
improvement

Effects on
fine lines

5%
Significant
improvement

63% No
change

19% Slight
improvement

Effects on
skin
moisture
content

18%
Significant
improvement

Effects in
skin
surface
texture
(pores,

19% No
change

63% Slight
improvement

ent
 roughness 18%
 etc.) Significant
 improvem
 ent

Side 83% None
 effects:
 stinging 17% Mild
 with initial 0%
 applicatio Uncomfort
 n able

73% None
 Side 16% Mild
 effects:
 erythema 11%
 Uncomfort
 able

Other side effects:

✦ 2 participants
 reported dryness and
 irritation

✦ 1 participants
 noted that skin was

red and felt warm

✦ Stopped Rx
because of pimples

Comments:

✦ 3 not sufficient
hydration

✦ 1 reduced
acne lesions

✦ 3 strange
texture, smell

✦ 5 significant
congestion,
comedones and
pustules

✦ 7 enjoyed
product, well
hydrated

✦ 5 improved
lines

✦ 1 too oily

✦ 2 too sticky

✦ I stopped
treatment due to
reaction

Discussion

Based on the findings above, it is clear that the two chemicals have distinct effects on the participants during the trial. For the product texture and consistency, Retinol is more comfortable than L-Ascorbic acid which were 79% and 52% respectively. The result showed that L-Ascorbic acid was more effectively on pigmentation with 63% slight improvement while there was no apparent change in the pigmentation since Retinol has no oxidizing properties. L-Ascorbic acid contains the Oxygen element that reacts with Hydrogen from the reacting material which is the skin. The L-Ascorbic acid takes the Hydrogen from the skin and combines it with the Oxygen to form water while the skin becomes discolored (pale or depigmented) (Oesterhelt, Schreckenbach and Walckhoff, 2011).

The results showed that Retinol had a small number of significant improvements compare with L-Ascorbic acid. Retinol has an effect of removing the dead cells from the skin encouraging the growth of new cells accounting for the smooth skin. However the L-Ascorbic acid does not remove the dead cells from the skin. As a result, new cells are not formed on the epidermal layer thus the lines of the skins are non-changed (Bouvier et al, 2010).

There are a slight improvement effects on skin moisture content for L-Ascorbic acid. The results showed that L-Ascorbic acid more moisture was 42% more than Retinol. the moisture content of the skin improved due to the oxidizing property of L-Ascorbic acid. After the oxidization process, water is formed and retained on top of the epidermal layer which is apparently observed as the skin moisture (Bouvier et al, 2010).

The participants that used Retinol showed 5% more number of the participants experienced a significant improvement on skin surface texture than the used L-Ascorbic acid. As Fox (2015) assert, Vitamin C (L-Ascorbic Acid) has no effect of restructuring the skin molecules thus the skin texture is retained.

For the side effect of stinging with initial, there are 5% the number of participants with uncomfortable after using L-Ascorbic acid while Retinol had zero. Also, for the side effect of erythema, the L-Ascorbic acid has fewer side effects compare with Retinol. From the participant's comments, L-Ascorbic acid was too light and dry skin, inappropriate for oily skin type, unpleasant sticky and odour. However, it was improve in PIHP. A great number of participants enjoyed used Retinol. There are a significant improvement of congestion, comedones and pustules. It is also improves lines, but it is not sufficient hydration.

In conclusion, the participants enjoyed Retinol compared to L-Ascorbic Acid. Retinol is more comfortable than L-Ascorbic Acid and a better component of cosmeceutical products due to its natural attribute bring new layers of cells that appear more attractive.

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