Investigation of ferment extract and botanical ingredient to the skin problems caused by prolonged mask wearing

SC_456

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Introduction:

Wearing a protective face mask has become a new normal due to the worldwide spread of Coronavirus disease 2019 (COVID-19). Not only for healthcare workers, but also all individuals are wearing face masks at leat 4-6 hours per day to prevent the potential disease transmission, which could cause negative effects on the skin. Just wearing the mask for 1 hour, skin changes such as increase in skin temperature and skin redness, along with increased sebum secretion was reported [1]. Other skin problems, such as erythema, papules, eruption, itching were also reported due to extended wear of face masks [1-2]. In this study, a combination of microbial ferment extract (Pseudoalteromonas ferment extract and Bacillus ferment extract) and botanical ingredient (Cordyceps sinensis extract and trametes versicolor extract) were investigated for their efficacy to solve the skin issues from prolonged mask wearing.

Results & Discussion:

a) Skin sensitivity and skin redness

Skin sensitivity is evaluated by lactic acid test. A self-assessment questionnaire of the intensity of symptoms (stinging, itchiness, burning and other) will be answered by subject after lactic application. The variation of score between 5% concentration of lactic and distilled water will be calculated and defined to the sensitive level. The area ratio of skin redness was evaluated by Visia CR.

Figure 1-2 show the improvement of skin sensitivity and the area ratio of skin redness after product application for 28 days. For all group, skin sensitivity score has been significantly reduced by 69.84% after 28 days. For the mature group (age from 35-45), 55.5% higher reduction of skin sensitivity was observed when compared with placebo. For skin redness, clearly, an age effect was observed. The products have better efficacy with mature group where the area ratio of skin redness has been reduced by 11.09% within one week.

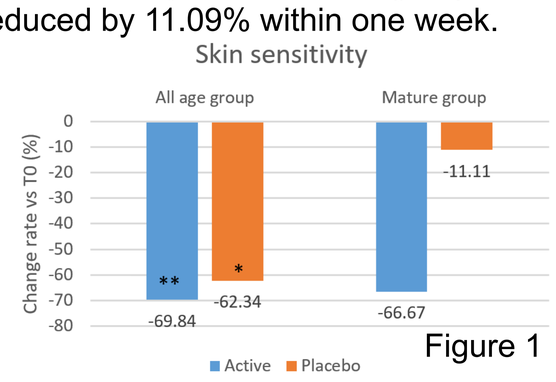


Figure 1

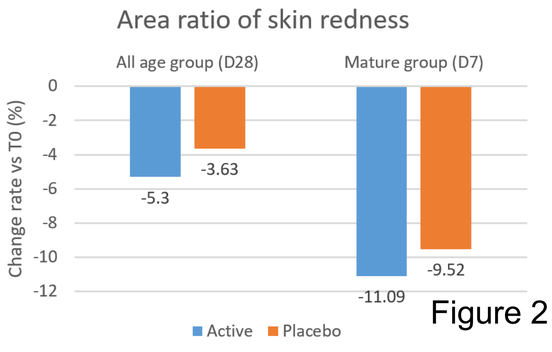
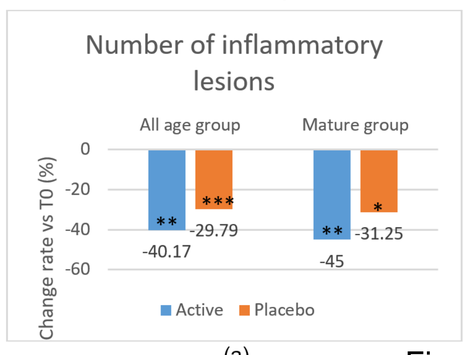


Figure 2

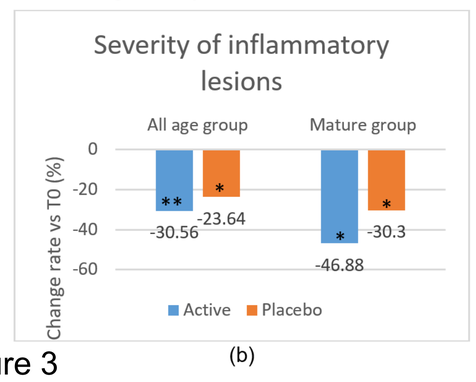
b) Inflammatory lesions

The counting and severity of inflammatory lesions were evaluated by clinical grading. For all age group, the number of inflammatory lesions has been significantly reduced by 40.17% and the severity of inflammatory lesions has been significantly reduced by 30.56% after 28 days. For mature group, a better efficacy was also observed. The number and severity of inflammatory lesions have been reduced by 45% and 46.88%, respectively, which is 13.8% more reduction when compared to the placebo in terms of number and 16.6% more reduction in terms of severity.

A representative image of one candidate at T0 and T28 days was shown in Figure 4. It can be observed that the overall redness and the inflammatory lesions have been greatly alleviated.



(a)



(b)

Figure 3

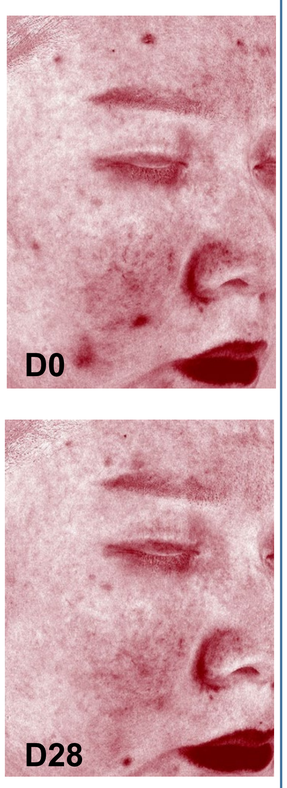


Figure 4

Materials & Methods:

1. Test information

Thirty-three healthy females aged from 19-45 were participated in the in-vivo study. Participants were required to apply the active cream and the placebo cream twice a day for 28 days. Meanwhile, participants were required to wear a mask at least 4 hours per day during the testing period.

2. Test product

The placebo cream is a simple gel cream. The active cream is the same cream base with 5% Pseudoalteromonas ferment extract solution (solution contains 22.5-27.5% Pseudoalteromonas ferment extract), 3% Bacillus ferment extract solution (solution contains 0.1% bacillus ferment) and 2% botanical ingredient (ingredient contains 36-44% Cordyceps Sinensis extract and 36-44% Trametes Versicolor extract).

3. Test design

This is a single center, random, non-treatment control and half face application design efficacy evaluation assessment study.

4. Efficacy evaluation parameters

Parameters	Methods	Evaluation sites
Skin sensitivity	Lactic acid test	Near the nose wing
Skin redness	Visia-CR	Cheek
Counting and severity of inflammatory lesions	Clinical grading	Whole face

5. Statistical analysis

Normality of data will be checked. While the distribution of each treatment at time series follows normal laws, ANOVA will be used to detect significant differences among time points. If significant, Dunnett's test (all time points versus T0) will be used for post-hoc comparison to detect significant pairs between baseline and others. Significant level of 0.05 will be used for all tests.

Conclusions:

Mask wearing has become a new normal due to the pandemic, during this period, the skin surface covered by the mask area will experience an increased temperature and humidity. In addition, when wearing the mask, it is constantly being rubbed against the skin. All these will lead to damage to skin barrier over time and skin will suffer from issues like skin sensitivity, oiliness, pimples and redness. Szepietowski has reported that 30%-50% of mask wearers were reported to have itchy and irritated skin after wearing mask for several hours [3].

In this study, a combination of microbial ferment extract (Pseudoalteromonas ferment extract and Bacillus ferment extract) and botanical ingredient (Cordyceps sinensis extract and trametes versicolor extract) were investigated for their efficacy to solve the skin issues from prolonged mask wearing. Pseudoalteromonas ferment extract is an active ingredient that can balance sebum production and skin hydration. It can also act to protect the skin barrier by inhibiting oxidative damage and reducing lipid oxidation. In-vitro studies have shown that this ingredient reduces inflammation and raises anti-oxidative defenses by regulating the expression of genes related to both processes. Bacillus ferment extract can regenerate damaged cells on the surface of the skin and can also prevent P.acnes-induced inflammation. In-vitro, it reduces P. acnes biofilm formation by 54.4% and decreases the inflammatory response associated to the presence of the bacteria. In-vivo, it helps to obtain a cleaner and smoother skin in different ethnicities. Cordyceps sinensis extract and trametes versicolor extract helps to suppress the skin inflammation pathways that leads to skin redness and irritation. When working together, the in-vivo test result confirms that the three actives can effectively repair and strengthen the skin barrier and help solve the skin issues from prolonged mask wearing. It has been found that skin sensitivity score, number and severity of inflammatory lesions were significantly improved when compared to D0. In addition, an age effect was also observed. Better efficacy of the active creams was observed in mature group (aged 35-45) in terms of skin sensitivity and inflammatory lesions.

References:

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