A NEW METHOD FOR THE *IN VIVO* VISUAL EVALUATION OF THE RADIANCE OF THE ASIAN SKIN COMPLEXION

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The objective of this work was to develop and validate a new method usable for the *in vivo* visual evaluation of the radiance of the complexion of Asian subjects. Since the radiance of the skin is upon the dependence of several factors, our method is based on the visual assessment of skin descriptors selected and defined during brainstorming sessions. These descriptors were the color of the skin (with 6 different hues), its luminosity, its brightness and its transparency. This paper will present the rationale of our method and the results of two clinical trials to illustrate the potentials of this sensory evaluation of the radiance of the skin’s complexion.

1. Introduction

In the cosmetic industry, evaluating the reality and soundness of the claims is of primary importance, in particular to support advertising/marketing and to meet some regulatory requirements as well. To provide supporting data on claimed benefits is already mandatory in the countries of the European Union. Similar requirements will be implemented in several South-East Asia countries in 2008 according to the Asean Cosmetic Directive. In most cases (e.g. moisturizing, whitening, anti-wrinkles, etc), this demonstration is not difficult to achieve thanks to the existence of numerous validated instrumental methods suitable for the measurement of the corresponding skin properties. However some claims put forward by the cosmetic manufacturers constitute strong challenges regarding their assessment. Among them, evaluating the *in vivo* efficacy of products designed to improve the radiance of the skin’s complexion or to recapture a healthy skin’s appearance was particularly difficult to handle since several physiological factors are clearly involved. A solution to this problem was provided two years ago by Musnier *et al* [1]. The principle of the method was based on the visual evaluation of a set of several descriptors of the skin’s radiance by trained assessors, thus replacing the lacking instrumentation by a sensory assessment by carefully trained experts. This original method was called C.L.B.T.™, acronyms for color, luminosity, brightness and transparency. During the last two years, this sensory evaluation of the radiance of skin’s complexion has been largely and successfully used to evaluate the capabilities of cosmetic products to enhance the radiance of the skin. However one limitation of the method was that it was restricted to the assessment of Caucasian skin only.

Therefore we have modified the initial method in order to obtain a method suited to the skin of Asian subjects. The initial C.L.B.T.™ method was based on the visual evaluation of several descriptors carefully selected to describe the radiance of the complexion of Caucasian women. These descriptors were the color, the luminosity, the brightness and the transparency of the skin. The visual evaluation of luminosity, brightness and transparency is made using analogical scales ranging from 0 to 10 (ex: 0 for the absence of brightness and 10 for a maximal brightness). The visual assessment of the color of the skin of Caucasian women involved structured color scales presenting the four main facial hues (red-pink, beige, olive and light-pink). Each hue is graded based on its saturation (from 10% to 100%). The above method has been modified after brainstorming sessions and visual observations of many Asian female subjects. Luminosity, brightness and transparency descriptors were kept since they were considered as pertinent and adapted to the evaluation of the complexion of Asian subjects. But the hues selected...
for the Asian version of the method were brown, light brown, beige, olive, yellow and light-pink.

Thus this paper presents the results of two clinical trials which aimed at validating the potentials of the new method and at evaluating the efficacies of two products (two different administration routes) aiming at improving the radiance of the skin: Glow cream and Glow oral supplement (Mega We Care, Thailand).

2. Materials and methods

The two trials were conducted separately, on two different study panels. Both studies were conducted on subjects sharing the same inclusion/exclusion criteria. Briefly, healthy Asian women, aged between 25 and 35 years old, presenting a dull complexion, with a skin phototype III-IV according to Fitzpatrick’s, were enrolled. Regarding the test of Glow cream, subjects had to apply the test product on the whole face and neck, once daily after a thorough cleansing, over a 2 month-period. With regards to the test of Glow oral supplements, subjects were required to take one capsule/time, twice a day, after meal during 2 months. Evaluations were carried out at baseline and at T+2 months.

2.1. C.L.B.T. evaluation

The skin complexion evaluation was based upon a visual sensory analysis of the four following descriptors: color, luminosity, brightness and transparency of the skin of the face (C.L.B.T. Method). This analysis was carried out by trained judges, without reference to the previous evaluation time. The subjects were sitting between two symmetrically installed “daylight” lamps. The subjects carried a black cap on the head. Additionally, a black gown was placed on their bust in order to hide the neck and the color of carried clothing. The evaluation was realized in a black room under controlled temperature.

2.1.1. In vivo visual evaluation of the colors

This evaluation was based on structured visual scales presenting a range of the 6 selected main colors of the facial skin (brown/light brown/olive/yellow/pink/beige). Each color saturated at 100% was then graduated. Each grade represented a certain percentage of saturation (Figure 1). The judges initially determined the various colors of the subject face skin and then attributed to each color under consideration, a grade of saturation in percentage terms.

![Figure 1. Structured scales for the complexion colors.](image)

2.1.2. In vivo visual evaluation of the luminosity, brightness and transparency

This evaluation was based on analogical scales whose ends were defined by the references "no transparency" (limit 0) and "maximum transparency" (limit 10) or "no luminosity" (limit 0) and "maximum luminosity" (limit 10) or "no brightness" (limit 0) and "maximum brightness" (limit 10). The judges evaluated visually on each volunteer the transparency, the luminosity and the brightness of their complexion.

2.2. Statistics

Mean marks and medians (+/- standard deviation) of the three trained judges, obtained at each examination, for each descriptor, for each subject, were calculated, as well as variations of the parameters relative to T0 values.

The proportions (%) of subjects presenting an improvement were determined for each descriptor.

Analysis of variance with repeated measurements over time, followed by Dunnett test comparing each time versus baseline, was used to determine the significance of the results. This analysis was carried on ranks, if the residuals of the analysis of variance were not distributed normally (Shapiro-Wilk test at the threshold of 1%). The threshold of significance for the whole statistical analysis was fixed at 5%.
3. Results

3.1. Test of the Glow oral supplement

The results of the sensory analysis of the complexion using the modified C.L.B.T. method (adapted for the assessment of Asian skin) showed significant variations of the following complexion descriptors, in comparison with the initial baseline values:

- significant increase in the “Brightness” (+50.8%; p<0.01);
- significant decrease in the “Olive” color (-25.1%; p<0.01);
- significant increase in the “Pink” color (+40.1%; p<0.05).

It is interesting to notice that the colors “Brown”, “Light brown” and “Beige” were relatively stable during the study time course. The tested Glow oral supplement did not significantly change these colors which can be considered as the constitutive colors of the subjects skin. Only the colors related to the radiance of the complexion (“Olive” and “Pink”) exhibited significant variations after 2 months of use of the tested product. With regards to the proportions of subjects who presented improvements for the descriptors of skin complexion after 2 months of treatment:

- 78.8% of the subjects presented an improvement of the brightness of the skin;
- 75.8% of the subjects presented improvements for the olive descriptor;
- 57.6% of the subjects presented an improvement of the pink descriptor.

3.2. Test of the Glow cream

The results of the sensory analysis of the complexion using the modified C.L.B.T. method showed significant variations of the following complexion descriptors, in comparison with the initial baseline values:

- significant decrease of the “Yellow” color (-31.9%; p<1.10^{-3});
- significant decrease of the “Olive” color (-33.8%; p<1.10^{-3});
- significant increase of the “Transparency” (+21.7%; p<0.01);
- significant increase of the “Luminosity” (+29.9%; p<1.10^{-3}).

Between T0 and T+2 months, a very important increase in the “Pink” color has also been observed: +30.2%. But this increase was only at the limit of the statistical significance (p<0.067).

Again it is interesting to notice that the colors “Brown”, “Light brown” and “Beige” were very stable during the study time course. The tested Glow cream did not significantly change these constitutive colors. With regards to the proportions of subjects who presented improvements for the descriptors of skin complexion after 2 months of treatment:

- 90.5% of the subjects presented improvements for the yellow and olive descriptors;
- 76.2% of the subjects presented an improvement of the transparency and luminosity of the skin;
- 61.9% of the subjects presented an improvement of the pink descriptor;
- 57.1% of the subjects presented an improvement of the brightness of the skin.

4. Conclusion

In view of these experimental data, we can conclude that the Glow cream and the Glow oral supplement were able to significantly improve the radiance of the complexion after 2 months of use.

Decrease in the “Yellow” color can be interpreted as an effect “looks good” (complexion was less yellowish).

Decrease in the “Olive” color can also be interpreted as an effect “looks good” (less of a greenish–olive complexion).

Increase in the “Pink” color is interpreted as “the skin looks healthier”.

Increase in the “Brightness” means that the homogeneity of the skin was improved.

Increase in the “Transparency” means that the skin seems to be thinner whereas an increase in the “Luminosity” is related to a more pronounced reflection of the light by the skin.

It is interesting to notice that only the colors related to the radiance of the complexion (olive, yellow and pink) exhibited significant variations after 2 months of use of the tested products. The other colors (brown, light brown and beige) were relatively stable during the study time course. Indeed, no variations were expected for these colors which can be considered as the
constitutive colors of the subjects skin. Nevertheless, in certain cases, they could be used to evidence a lightening effect of one tested treatment, even if for this claim others and more sensitive methods exist. When the “Asian” method is compared to the results usually obtained with Caucasian subjects, our preliminary data suggest that the changes in the yellow, olive and pink hue saturations are more easily detectable in Asian subjects.

Since these two trials, several other studies have confirmed that the modified “Asian” version of the C.L.B.T.™ method has the potentials to reliably substantiate the efficacy of cosmetic treatments claiming their abilities to improve the radiance of the complexion. It should be said that the sensitivity and reliability of this new method rely upon the appropriate training and validation of the evaluation performances of the technicians in charge of the visual scorings. This training includes difference and intensity tests which are very well described in the methodology manuals of standard sensory evaluation techniques.

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References