

AN "USE TEST" TO EVALUATE THE EFFICACY OF ORAL FISH CARTILAGE POLYSACCHARIDES IN THE TREATMENT OF PHOTOAGING

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Summary

Topically applied cosmetic products can be helpful in improving aged skin condition. The study shows how oral fish cartilage food supplementation can be helpful in improving the treatment of aging skin. 30 healthy women with signs of skin ageing entered the study. 15 were treated with a food supplement based on polysaccharides derived from fish cartilage and a natural mix of antioxidants for 2 months and 15 with a placebo. Clinical evaluation as well as macrophotographic documentation was taken in order to monitor product effects. Parameters considered were: dryness, skin tone, age spots, fine lines. The results showed statistically significant improvement in the active treated group as compared to the placebo. In particular, fine lines ($p < 0.002$), skin dryness ($p < 0.003$), skin tone ($p < 0.02$), showed considerable improvement. No significant changes were detected for age spots. Most of these parameters are related to changes occurring within the dermal matrix, which is improved after treatment, while most of the topically applied cosmetic products have a short term effect on superficial structures. A combination treatment (oral and topical) can be more effective in reducing the signs of skin aging.

Riassunto

I prodotti topici cosmetici possono essere utili nel migliorare le caratteristiche della cute nel corso dell'invecchiamento cutaneo. Lo studio mostra come i polisaccaridi della cartilagine di pesce integrati oralmente nella dieta possono essere utili nel combattere i danni del photoaging. 30 soggetti di sesso femminile hanno partecipato allo studio. 15 sono stati trattati con placebo e 15 con un prodotto a base di antiossidanti, ginkgo biloba, e cartilagine di pesce (Reviface, Medestea Internazionale, Torino). E' stata effettuata una valutazione clinica mediante macrofotografia. I parametri considerati sono stati: secchezza cutanea, tono cutaneo, macchie senili e rughe sottili. I risultati mostrano un significativo miglioramento di alcuni dei parametri osservati rispetto al placebo. In modo particolare le rughe sottili ($p < 0,002$), la secchezza cutanea ($p < 0,003$) ed il tono cutaneo ($p < 0.02$) hanno mostrato un significativo miglioramento. Nessun cambiamento e' stato rilevato per le macchie cutanee senili. La maggior parte di questi risultati sono collegati ad un miglioramento della qualita' della matrice dermica ottenuta dai principi attivi del trattamento. Mentre i prodotti topici sono agiscono a

livello delle strutture cutanee superficiali, l'integrazione orale permette di creare sinergismi efficaci nello sviluppo di prodotti piu' efficaci nel ridurre i segni dell'invecchiamento cutaneo.

INTRODUCTION

The appearance of wrinkles is one of the most visible signs of skin ageing. This results from both intrinsic and extrinsic ageing which affect dermal properties. Cosmetic products based on different active principles are very active in treating and preventing skin ageing after topical application: therefore, they may affect mainly epidermal structures 1. Dermal effects of such treatments may be visible after several months. On the contrary, cosmetic treatments as food supplements or dietary products have been proved of little effect in the short term 2. The aim of this study is to evaluate the efficacy of oral fish cartilage in the prevention and treatment of the cutaneous changes associated with skin aging such as wrinkles.

MATERIALS AND METHODS

STUDY DESIGN

A double-blind vs. placebo conducted on 30 healthy female volunteers for 8 weeks. During this period, subjects were treated with 3 capsules (product or placebo) a day, each capsule containing 250 mg of marine fish cartilage associated with an antioxidant mix (gingko biloba, flavonoids, centella asiatica). The placebo contained only soybean oil.

SUBJECTS

30 healthy female volunteers (age range 35-60) participated to the study. They were visited at baseline (week 0) and week 8. They were selected according to the following inclusion criteria:

- caucasian race (II or III phototype according to the Fitzpatrick scale)
- signs of photoageing and skin wrinkling ranging from 3 to 5 according to Larnier's scale 3;
- discontinuation of treatments containing reti-

noids and derivatives at least 6 months before the beginning of the study

- discontinuation of treatments containing alphahydroxiacids and derivatives at least 45 days before,
- discontinuation of other antiageing treatments at least 2 months before;
- signing of an informed consent;
- avoidance of sun exposure
- avoidance of any oral medication (hormone replacement therapy, birth control pills, etc..) which could interfere with the results of the study.

At the baseline visit volunteers were instructed not to apply or get orally other anti-wrinkle products/food supplements, and not to apply, at each visit, any product on the face over the previous hours. Subjects rested for a 20 minutes acclimatation period before undergoing the visual assessment performed by a trained dermatologists.

CLINICAL ASSESSMENT

Clinical assessment was performed by a trained investigator evaluating the following parameters:

- skin dryness, with particular regard to the changes induced in microrelief
- age spots, or mottled discoloration consequent to photoageing of the face
- skin tone, i.e. the firmness of facial skin, with particular regard to the cheek and crow's feet area
- the presence of fine lines in the crow's feet area

The scoring system was based on a scale ranging from 0 to 9 according to the following ranks:

0 = no signs

1-3= smooth
4-6= moderate
7-9= severe

Statistical analysis of the data was performed by Wilcoxon test using Statistica (Statsoft, Inc, USA) software package.

MACROPHOTOGRAPHY

Pictures of the crow's feet area were taken before and after the study in standardized conditions using a macrocamera (Asahi Pentax Co, Japan) with a macrolens (macro 50, Asahi Pentax Co, Japan).

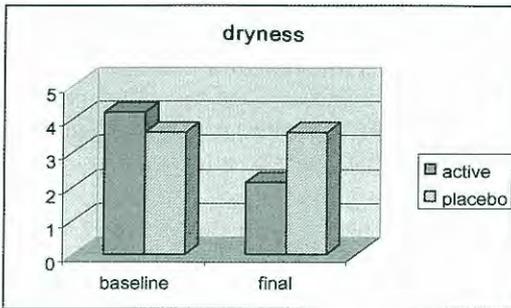


Figure 1. Significant improvement of skin dryness ($p<0.003$) in the group treated with the active product. No changes in the placebo treated group.

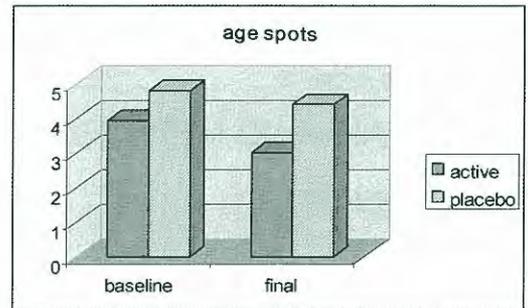


Figure 2. Mottled hyperpigmentation before and after treatment. No significant changes.

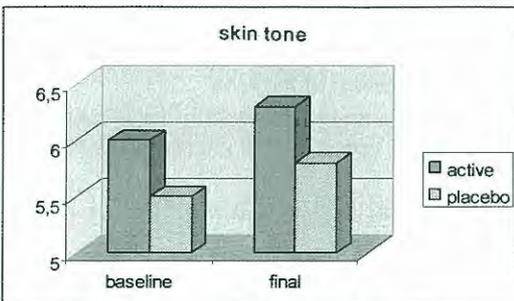


Figure 3. Statistically significant improvement in skin tone ($p<0.02$) in the group treated with the active product consistent with increased firmness of facial skin. No significant changes in the placebo group.

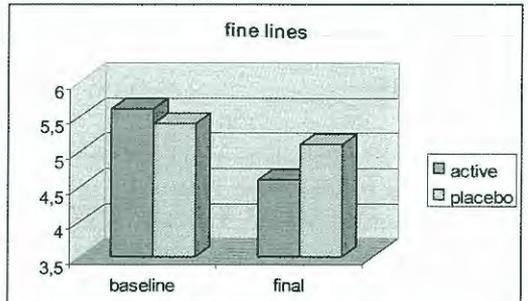


Figure 4. Significant reduction of fine lines in crow's feet area ($p<0.002$) in the group treated with the active product. No significant changes in the placebo group.

RESULTS

Results are shown in Figures 1,2,3,4,5,6,7,8. Improvements of all clinical parameters considered have been recorded in active product treated group. In particular s significant improvement in fine lines ($p<0.002$), skin tone ($p<0.02$) and dryness ($p<0.003$). An improvement, even though not significant has been detected for the intensity of skin discoloration. No significant changes have been monitored in the placebo treated group.



Figure 5. Baseline before the study



Figure 6. Same subject of Fig. 5 after 8 weeks of the active product.



Figure 7. Baseline before the study.



Figure 8. Same subject as in Fig. 7 after 8 weeks of treatment with the active product

DISCUSSION

Solar exposure and intrinsic ageing lead to a deterioration of dermal and epidermal properties causing several changes on skin surface such as wrinkling, changes in skin colour, and loss of skin mechanical properties⁴. From a structural viewpoint the major damage is located at the dermal level with the formation of the so called solar elastosis, i.e. the accumulation of degenerated collagen and elastic fibers in the upper dermis⁵. Cosmetic treatments or cosmeceutical products, when topically applied, can be effective in improving epidermal components of skin ageing and after long term application help in removing solar elastosis by promoting new collagen synthesis.

Fish polysaccharides, when taken orally, are reported to be effective in treating photoageing (with particular regard to elastosis, and wrinkles) and chronological ageing (especially as to the thinning of the skin) ^{2,6,7,8}.

Their mechanism of action is still basically unknown: previously reported data suggest a possible role in promoting collagen synthesis and in particular procollagen and Type III collagen which stimulate repair processes within the dermis ⁷. The high content of mucopolysaccharides can improve dermal ground substance thus improving skin tone and thickness ² thus reducing skin wrinkling. Indeed, the improved quality and amount of dermal structures results in a decreased depth and volume of wrinkles. Our "in use" study shows a significant improvement of some clinical cosmetic features related to skin ageing such as fine lines, skin tone and perceived skin hydration which can be explained with the functional and biochemical changes occurring in the dermis. The improvement of the perceived skin hydration can be related both to an increased level of glycosaminoglycans in the dermis, but also to a thicker stratum corneum as hypothesized by some authors after observing an increased thickness of the epidermal en-

try echo detected by C-scan ultrasound. Other groups reported improvement of the clinical signs of photoaging such as teleangectasias and hyperpigmentation ^{2, 9} these findings were reported on the basis of a randomized evaluation of clinical pictures; in our study, the mottled discoloration was improved but not significantly. This effect can be consequent to the light reflection changes occurring in the dermis after the replacing of elastotic material. No side effects, besides some sense of epigastric discomfort after the first days of treatment have been reported during the study. At the moment no data are available on the duration of the clinical and instrumental improvements recorded in the present work. Further studies to elucidate in deep the mode of action and the dynamics in relation to length of treatment are needed.

The study confirms the importance of fish polysaccharides in the cosmetic treatment of skin ageing when taken orally. This can be a new strategic approach in combination with topically applied active principles exerting a synergistic and simultaneous effect on epidermis and stratum corneum.

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