

ORAL ADMINISTRATION OF GELATIN-GLYCINE FOR AGED SKIN

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Synopsis

A major part of the visible alterations associated with skin ageing reflects functional modifications in the behavior of various time components within the skin. The reduction in the water-holding capacity and in surface lipids of stratum corneum and its subsequent dryness also influence the general aspect of the skin. Superimposed on the innate aging process are the effects of a lifetime of exposure to the elements, the most damaging being UV radiation. In face UV light is responsible for most of the characteristics associated with aging skin. The aim of this study, was to evaluate, on photoaged skin of 60 women, the combined use of topical cosmetics together with oral Gelatin-Glycine (QM® Dietetic) on their surface skin lipids, hydration and TEWL monitored for 90 days using the new 3C System® computerized equipment. In addition, the Gelatin-Glycine's protective action against UV-induced lipidic peroxidation was assessed by malonildialdehyde determination. Interesting improvements noted in these various parameters suggest that Gelatin-Glycine may be useful in the prevention of premature skin ageing.

Riassunto

La maggior parte delle alterazioni visibili, associate all'invecchiamento della pelle, riflettono modificazioni funzionali dei vari tessuti cutanei. La ridotta capacità di legare acqua dello strato corneo, associata con una diminuzione dei lipidi di superficie e con la conseguente secchezza cutanea, influenzano l'aspetto generale della pelle. Tutte queste carenze vengono ulteriormente accentuate dagli effetti provocati nel tempo dagli inquinanti ambientali e dagli agenti atmosferici, quali soprattutto le radiazioni solari. Infatti gli UV sono i maggiori responsabili dell'invecchiamento cutaneo estrinseco. Scopo di questo lavoro è di valutare l'attività svolta, sulla cute di 60 donne fotoesposte, dall'azione contemporanea di cosmetici e di un dietetico a base di Gelatina-Glicina (QM® Dietetico). Come parametri di controllo sono stati scelti l'idratazione cutanea, i lipidi di superficie e la TEWL, che sono stati controllati mediante l'uso di una apparecchiatura computerizzata, il 3C System®. Inoltre è stata valutata anche l'attività protettiva esplicata dalla Gelatina-Glicina contro i danni provocati dagli UV sui lipidi cutanei, determinando la quantità di radicali liberi (perossidi) con il metodo della Malonildialdeide. Gli interessanti miglioramenti notati su questi parametri di controllo, suggeriscono l'uso della Gelatina-Glicina nella prevenzione e nel trattamento dell'invecchiamento cutaneo.

Ageing causes the skin's fatty tissue to wear and connective tissue to alter, resulting in changes in skin color, thickness and elasticity. In addition, a steady decrease in sebum production reaches its peak at the age of 50 to 60, while even more significant changes in the skin's water content are taking place (1-3). Alterations in the connective tissue include decreases in the volume of its colloidal chemicals, and in the enzymatic reactivity in elastic and collagen fibers (4). Such phenomena increase in winter due to low relative humidity. In fact, the horny layer competes effortlessly with the environment in capturing water. If not properly treated, skin dehydrates, loses flexibility and ages prematurely. Therefore, a proper amount of surface lipids, and of the horny layer's water content has to be preserved. Simultaneously, collagen production should be stimulated and damage from free radicals should be reduced (5-7).

The objective of this study was to determine, on photoaged skin, the combined use of topical cosmetics together with oral Gelatin-Glycine (QM® Dietetic).

Material and methods

Materials

QM® Cleansing Lotion⁽¹⁾

Distilled water, Cetearth-6, Isopropyl myristate, Octyl stearate, Sorbitol, Glycerin, Propylene glycol, Tocopheril acetate, Rethynil palmitate, Imidazolidinyl urea, Linoleic acid, Linolenic acid, Methylparaben, Hydrolyzed collagen, Gelatin-Glycine, Disodium EDTA.

QM® Antiage Drops⁽²⁾

Soluble collagen, Propylene Glycol, Glycerin, Sodium PCA, Lactic Acid, Glycine, PCA-Arginine, Panthenol, Glycolic Acid, Peg-40-Hydrogenated Castor oil, Fragrance.

QM®-H10 Cream⁽³⁾

Water, C12-18 acid PEG-8 ester, Cetearth-10,

Isopropyl Lanoleate, Stearyl heptanoate, Sorbitol, Beeswax, Cetearyl octanoate, Spermactin, Myristyl alcohol, Mineral oil, Desamido collagen, Glycerin, Witch hazel extract, Linoleic acid, Linolenic acid, cyclomethicone, Dimethicone copolyol, Sodium PCA, Tocopheryl acetate, Gelatin-Glycine, Allantoin, Lecithin, Glycolic acid, Imidazolidinyl urea, Methyl paraben, Propyl paraben, Disodium EDTA.

QM® Dietetic⁽⁴⁾ (Gelatin-Glycine pills) (active)

Gelatin-Glycine 225mg, Ascorbic acid 22.5mg, PP Vitamin 7.5mg, Fe++ 3.6mg, Zu 3mg, Mn 0.75mg, Cu 0.6mg, B1 vit. 0.45mg, B2 vit. 0.68mg, B6 vit. 0.52mg, Folic Acid 0.75mg, B12 vit. 0.75mg

Control Pill

Gelatin-Starch 255 mg

⁽¹⁾ Trade name QM LOZIONE DETERGENTE

⁽²⁾ Trade name QM ANTIAGE GOCCE

⁽³⁾ Trade name QM 10 IDRATANTE

⁽⁴⁾ Trade name QM DIETETICO

Methods

3C System® Dermotech

Surface sebum skin hydration and TEWL were measured on the forehead by the use of the 3C System® Dermotech. This computerized system permits a simple and quick determination of the quantity of lipids, hydration and TEWL at the surface of the skin, while environmental conditions are automatically standardized (RH=50% t=22 C). The 3C System® reports sebum data in $\mu\text{g}/\text{cm}^2$, TEWL in $\text{g}/\text{m}^2\cdot\text{h}$ and hydration data in 3C Values by direct readout.

Photoaged skin

Pre-exposure to UV-A-emitting lamp

During testing the 60 panelists were pre-exposed to UV-A radiations for one month two times a week. They received 50 joule/cm² of UVA

(340-400 nm) 15 min. on the entire face. For UV-A exposure (photoaged skin) it was used the apparatus UV-A sun with filtered metal halide lamps. UVA Cryl was the plastic filter system used.

Cosmetic treatment

Sixty women volunteers, between 35 and 45 years of age, all pre-exposed to UVA as previously described, were divided into 3 groups of 20 individuals. Each group was randomly given

Pills sufficient for three months of treatment (4 pills a day).

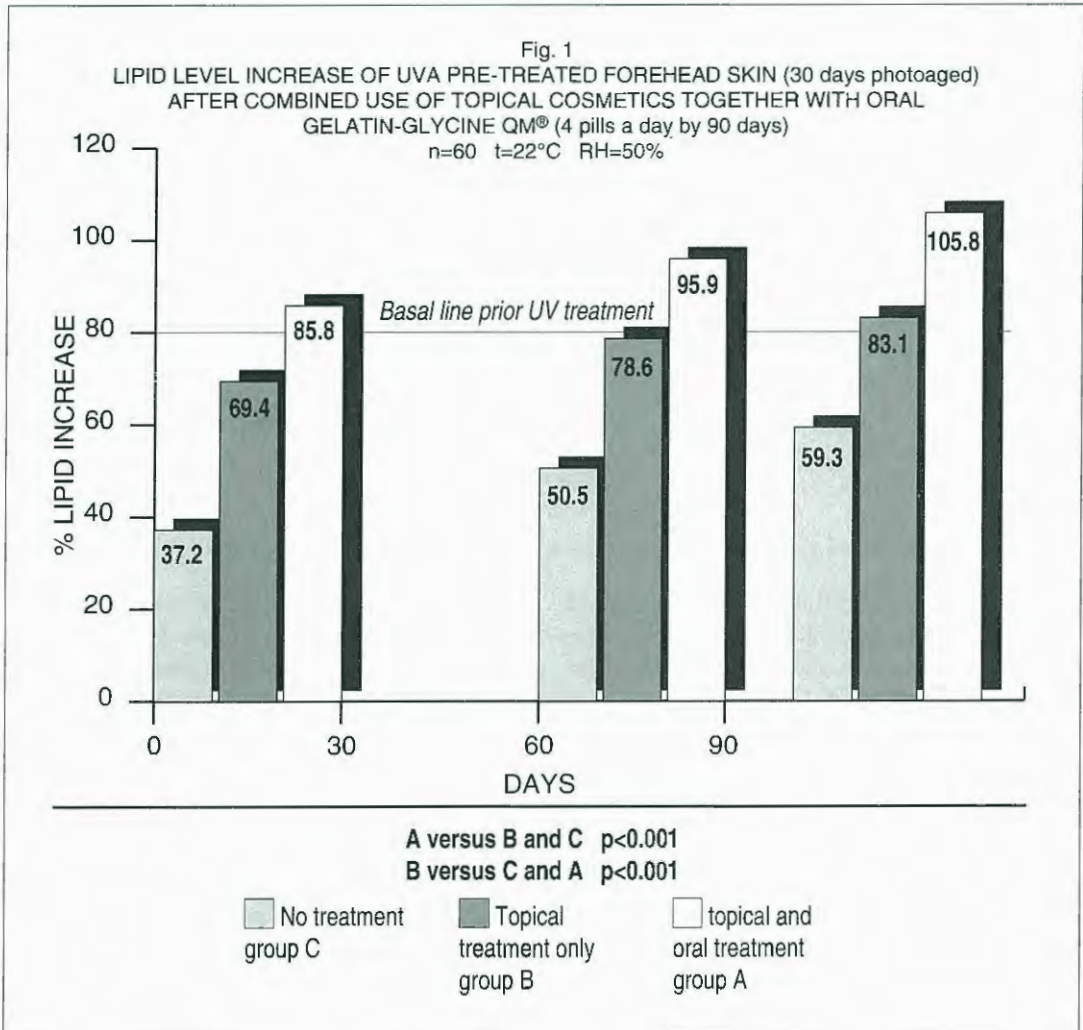
The three groups were:

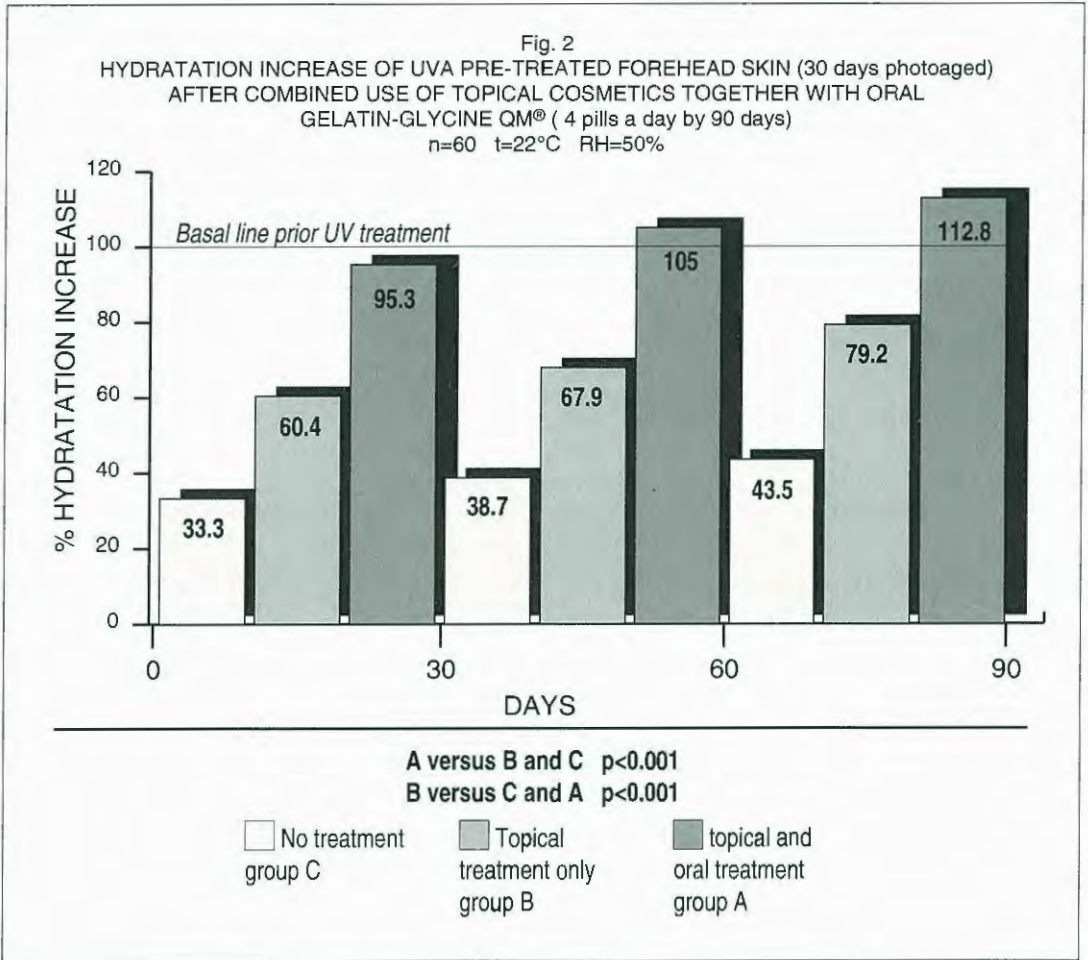
Group B: Topical cosmetic treatment only and control pills

Group A: Combined use of topical cosmetics together with oral products based upon gelatin-glycine (QM® Dietetic 4 a day)

Group C: No treatment (only control pills).

The pills were administered orally (4 a day) for 90 consecutive days from April to June 1991.



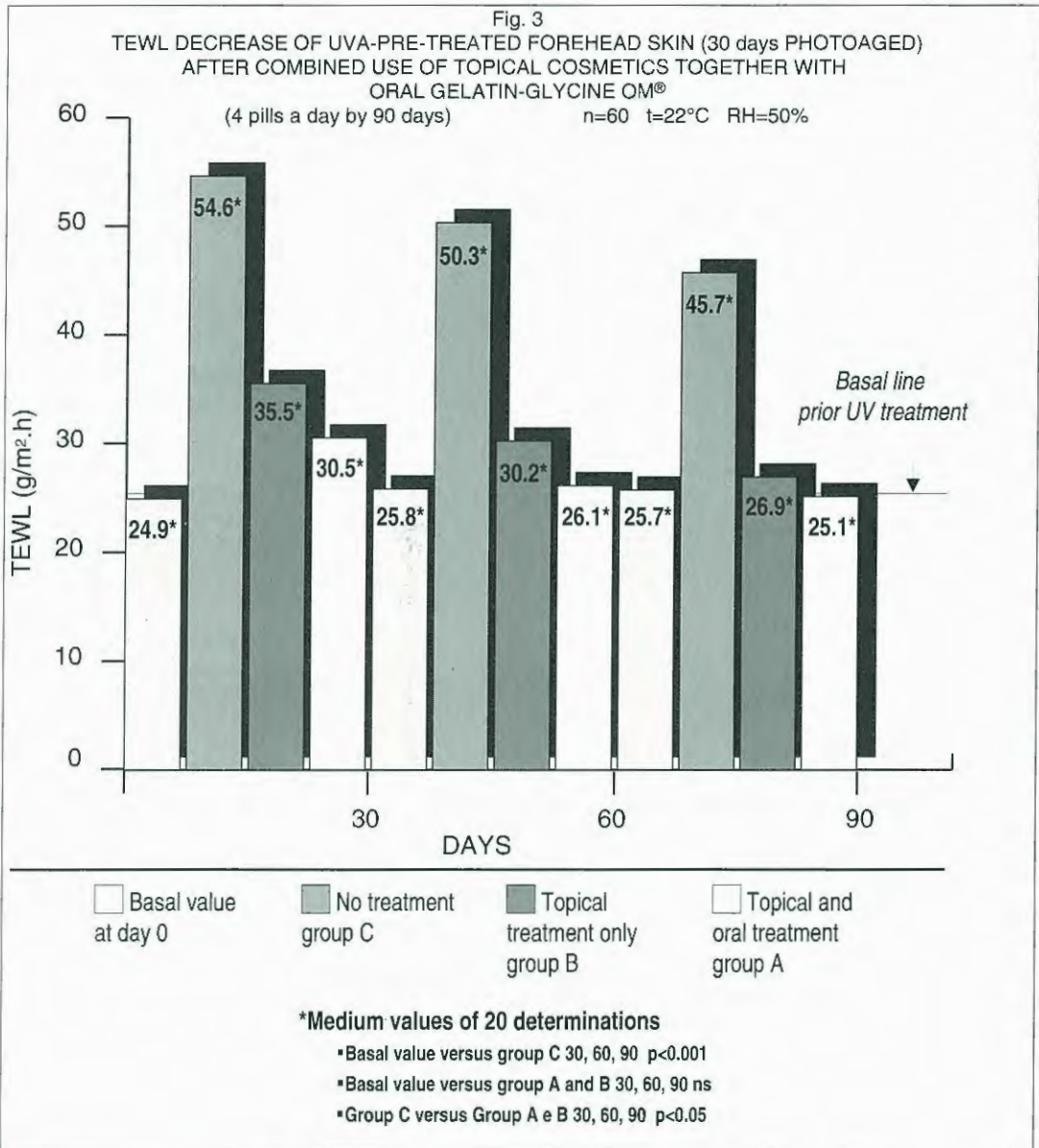


Four weeks before treatment period, drug and diet food were prohibited, and all the 60 subjects used no cosmetics, except the Cleansing lotion QM provided by us.

During the treatment period (90 days) 40 subjects (Group A + Group B) used two different cosmetic products (QM® drops and QM® H-10 cream) to be applied twice a day with *ad libitum* applications, after using the QM® cleansing lotion and abundant water rinsing. 20 subjects only (Group A) have taken, orally, the active pills (QM®) and all 60 were pre-exposed to UVA radiations for one month two time a week as previously described.

The mean values for surface sebum and skin hydration and TEWL were taken from each subject by carrying out four separate measurements, in adjacent areas on the forehead or/and on the cheeks, as previously described in our studies. (10) These measurements were taken, by 3C System® Dermotech, between 8:30 and 10:30 under standardized conditions. Results are listed in Figure 1-3.

Skin lipids peroxidation was assessed by Ohkido et al methodology (8) reading at 531 nm the final concentration of peroxides determined as malonydialdehyde (MDA) precursor (8). Results are listed in Figure 4



Measurement of skin hydroperoxides

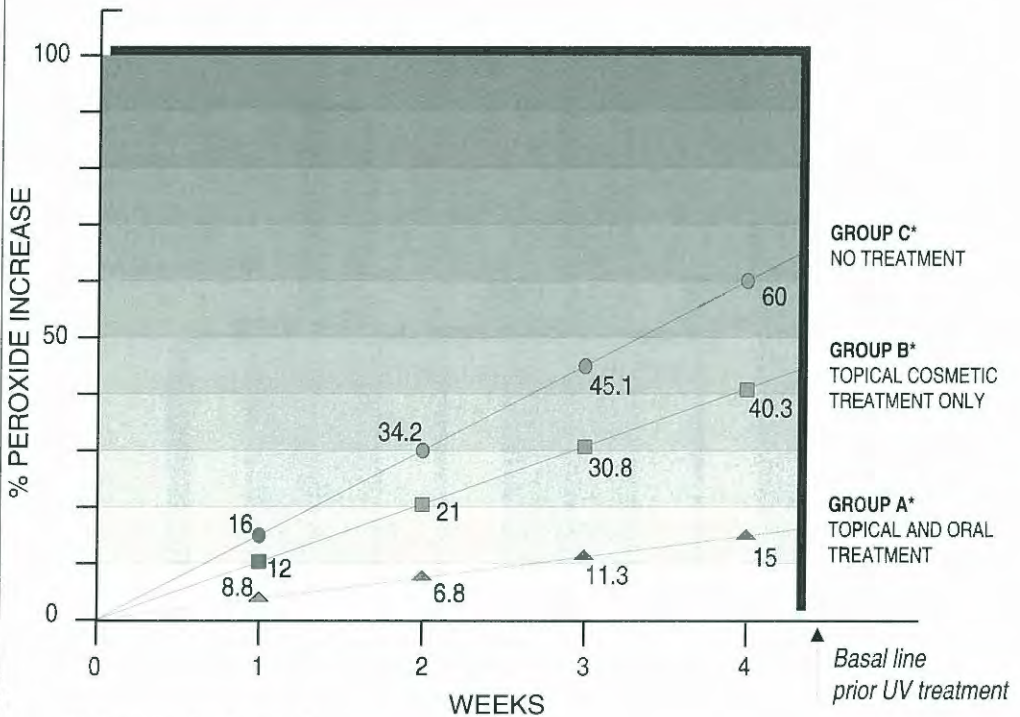
It seems to be a linear relationship between the quantity of peroxides recovered on the skin and the subject's ageing (8).

Since the production of lipid peroxides are markedly influenced by UV light it was control-

led the level of peroxidation of skin lipids before and after exposition to UV-A radiation. Each week and at the end of the first month of experimental period, skin lipids were extracted from cheek and/or forehead skin areas, using acetone as the solvent, according to Pugliese (9).

Fig. 4

LIPID PEROXIDES VARIATION OF UVA PRE-EXPOSED CHEEKS SKIN (30 days photoaged)
 AFTER COMBINED USE OF TOPICAL COSMETICS TOGETHER WITH
 ORAL GELATIN-GLYCINE QM
 (MDA METHODOLOGY 1990) 4 pills a day by 30 days n=60 t=22°C RH=50%



* Medium value of 20 determinations
 P < 0.05

Results and Discussion

These results support our previous obtained data (11,12). Gelatin-Glycine QM® seems to exert an interesting moisturizing and anti-wrinkle action (Fig. 1-4). It seems to be an interesting relationship between the quantity of peroxides recovered in photoexposed skin and the protective action exerted by topical application and oral administration of Gelatin-Glycine QM® (Fig. 4). The combined use of topical cosmetics together with oral gelatin-glycine (QM® Dietetic) is associated with a significant decrease (from 33 to 75%) of the quantity of skin hydroperoxides,

with an interesting increase of surface moisturizing (from 180 to 260%) and skin lipids (from 95 to 160%) and decrease of TEWL (50% about). It is also interesting to point out the altered values by UV treatment of superficial skin lipids, hydration, TEWL and lipid peroxides come back to basal values soon after 60/90 days of topical and oral Gelatin-Glycine QM® use. Improvement noted in these various parameters, confirms that Gelatin-Glycine may represent an effective cosmetic therapy for the treatment of photoaging or premature ageing of the skin.

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