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Newspaper article – online	Pollack A. FDA approves new cystic fibrosis drug. *New York Times*. January 31, 2012. http://www.nytimes.com/2012/02/01/business/fda-approves-cystic-fibrosis-drug.html?ref=health. Accessed February 1, 2012.
Websites	Outbreak notice: Cholera in Haiti. Centers for Disease Control and Prevention Web site. http://wwwnc.cdc.gov/travel/notices/outbreak-notice/haiti-cholera.htm Published October 22, 2010. Updated January 9, 2012. Accessed February 1, 2012.
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Book chapter – in print	Solensky R. Drug allergy: desensitization and treatment of reactions to antibiotics and aspirin. In: Lockey P, ed. *Allergens and Allergen Immunotherapy*. 3rd ed. New York, NY: Marcel Dekker; 2004:585-606.

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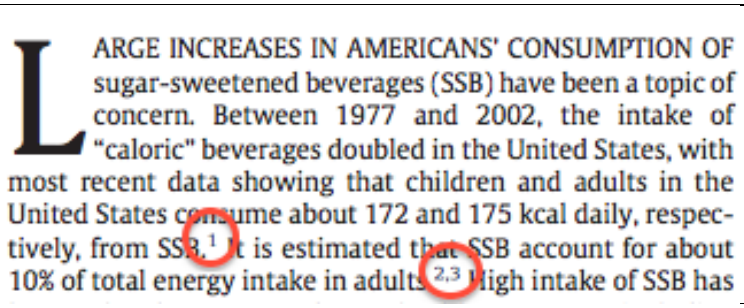
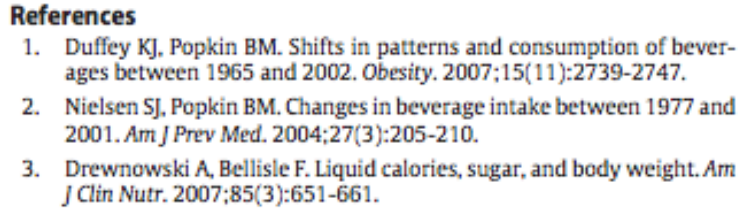


LARGE INCREASES IN AMERICANS' CONSUMPTION OF sugar-sweetened beverages (SSB) have been a topic of concern. Between 1977 and 2002, the intake of "caloric" beverages doubled in the United States, with most recent data showing that children and adults in the United States consume about 172 and 175 kcal daily, respectively, from SSB.[1] It is estimated that SSB account for about 10% of total energy intake in adults.[2,3] High intake of SSB has

References Section Example



References

1. Duffey KJ, Popkin BM. Shifts in patterns and consumption of beverages between 1965 and 2002. *Obesity*. 2007;15(11):2739-2747.
2. Nielsen SJ, Popkin BM. Changes in beverage intake between 1977 and 2001. *Am J Prev Med*. 2004;27(3):205-210.
3. Drewnowski A, Bellisle F. Liquid calories, sugar, and body weight. *Am J Clin Nutr*. 2007;85(3):651-661.

Use commas to separate multiple citation numbers in text, like you see between references 2 and 3. Unpublished works and personal communications should be cited in the text (and not on the reference list).[1] Superscript numbers are placed outside periods and commas, and inside colons and semicolons. When citing the same source more than once, give the number of the original reference, then include the page number (in parentheses) where the information was found. See pages 41-44 of the *AMA Manual of Style* for more information.

References

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EDITORIAL

In recent years, aesthetics has become quite important in every aspect of everyday life: following the hundreds of journals, magazines, blogs and websites drawing attention to this interesting and fascinating topic, the demand for aesthetic medicine has multiplied.

Aesthetic Medicine is a field of medicine, in which different specialists share the aim of constructing and reconstructing the physical equilibrium of the individual. Treatment of physical aesthetic alterations and the unaesthetic sequelae of illnesses or injuries, together with the prevention of aging, are perhaps two of the most iconic areas of intervention for Aesthetic Medicine. However, in order to prevent frailty in the elderly, an educational programme is also important. Furthermore, the line between health and beauty is extremely thin: psychosomatic disorders resulting from low self-esteem for aesthetic reasons are frequent, and cannot be ignored by a clinician.

It is therefore clear that there is no figure in the field of medicine who is not involved in Aesthetic Medicine: endocrinologists, gynaecologists, angiologists, psychologists and psychiatrists, plastic surgeons, dermatologists, dieticians, physiotherapists, orthopaedists, physical education instructors, massophysiotherapists, podiatrists, and rehabilitation therapists are just some of the specialists who are sooner or later going to have to answer their patients' needs for aesthetic interventions. The involvement of all these specialists fits the description of health as defined by the WHO: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" for which, undeniably, a team of different physicians is required.

The number of patients requiring medical consultation for aesthetic reasons is rapidly increasing: in order to be able to provide adequate feedback, medical and paramedical specialists should be trained and, more importantly, should be taught how to work together. Existing Societies of Aesthetic Medicine from different countries share the aim of creating such teams and provide constant updates to the literature: the creation of an international network of specialists from all around the world under the flag of Aesthetic Medicine represents a challenge, but at the same time it is proof of the widespread interest in this topic.

The first issue of this Journal represents the results of the efforts of the many national Societies and of the *Union Internationale de Médecine Esthétique,* now together as one; it is our hope that in years to come this Journal might improve our knowledge in this field, and provide adequate scientific advancement in the field of Aesthetic Medicine.

Francesco Romanelli, MD
Editor-in-chief
Associate Professor at "Sapienza"
University of Rome

EDITORS' NOTES

Aesthetic Medicine, the booming medical activity

Aesthetic Medicine was born in France 40 years ago. The French Society of Aesthetic Medicine was the first of its kind in the world, followed by Italy, Belgium and Spain. Its beginnings were rather difficult as aesthetic procedures in those early years were only surgical. At that time aesthetic doctors and cosmetic dermatologists had very few real medical procedures to offer to their patients for treating aesthetic problems on the face and body.

At the beginning of the 1980s, viable medical procedures started to emerge in Europe for aesthetic and cosmetic purposes. Mostly, at that time, they were imported from the United States: they included collagen injections for wrinkles (Zyderm by Dr. Stegman) and chemical peels (phenol by Dr. Baker, TCA by Dr. Obagi). But subsequently, European research on Aesthetic Medicine gained momentum. Hyaluronic acid appeared on the market, as it was discovered that it could be used as a dermal filler for wrinkles.

During the 1990s, the use of lasers offered aesthetic doctors and cosmetic dermatologists new possibilities. The "beam revolution" started with CO2 laser for facial resurfacing. Today, CO2 resurfacing is not used as much anymore, because of the long and difficult post-op. CO2 laser was replaced by the gentler Nd-YAG and Erbium lasers and more recently by non-invasive photonic devices for facial rejuvenation, including IPL, US and radiofrequency. These new technologies allow today's aesthetic doctors and cosmetic dermatologists to offer their patients procedures with a low risk of post-op complications.

Since then, Botulinum Toxin has "invaded" both sides of the Atlantic Ocean. Today, Botox injections are the most popular treatment for facial expressive wrinkles. Botox injections are now so common everywhere that many cosmetic surgeons have given up their bistouries for syringes.

Last but not least, development in Aesthetic Medicine is shown by mesotherapy and adipolipolysis. Regarding lipolysis, new data and recent publications have explained that radiofrequency, ultrasounds and cryolyse could have positive effects in dissolving fat and improving some unaesthetic disorders like cellulite. These non-invasive procedures aim to replace surgical liposculpture successfully.

Nowadays, Aesthetic Medicine has the necessary tools to address all major disorders within the aesthetic field.

After 40 years, Aesthetic Medicine is now active in 27 countries in the world (France, Italy, Spain, Belgium, Morocco, Poland, Russia, Switzerland, Romania, Kazakhstan, Algeria, Brazil, Argentina, Uruguay, Venezuela, Colombia, Chile, Mexico, U.S.A, Canada, South Korea, and recently Ecuador, China, South Africa, Turkey, Ukraine and Georgia). All 27 national Societies are members of the *Union Internationale de Médecine Esthétique* (U.I.M.E.).

Aesthetic Medicine is taught in 8 countries (France, Italy, Spain, Brazil, Argentina, Mexico, Venezuela, Kazakhstan) in universities that award UIME's diplomas after 3 to 4 years of studies.

What is the future of Aesthetic Medicine?

During the last few decades, patients' desire to look and feel younger has fueled Aesthetic Medicine and Cosmetic Dermatology: many different procedures have been developed to satisfy the demand.

As lifespans have increased, patients today are not only asking about aesthetic procedures, but also asking for a way to stay in good physical condition during the final decades of their lives.

As a direct result, Anti-Aging Medicine, which covers skin aging and general aging, has recently emerged and expanded very rapidly.

Anti-Aging Medicine can offer senior patients better nutrition, dietary supplementation with vitamins, minerals and antioxidants, and eventually hormone replacement therapy, but only when needed.

Today, and in the near future, both Aesthetic Medicine and Anti-Aging Medicine will offer to our patients, who now live longer, better health with aesthetic treatments for skin aging and anti-aging treatments for general aging.

Aesthetic Medicine is booming, but all medical practitioners should be correctly trained so that its future will be bright.

Jean-Jacques Legrand, MD
General Secretary of UIME

Aesthetic Medicine: a bioethical act

When in 1977 the Italian Society of Aesthetic Medicine published the first issue of the magazine "La Medicina Estetica" Carlo Alberto Bartoletti, the Founder, wrote an editorial which traced the history of the discipline and of the Scientific Society, still valid, and projected it into the future.

Today from that Editorial Board an International Journal has emerged, which wants to be indexed, in order to give doctors practising Aesthetic Medicine all around the world a solid basis of shared knowledge.

In the late 1960s, what was called in Italy Aesthetic Medicine, took its first steps thanks to "remise en forme and anti aging projects" imported from the experience of the "Institutul de geriatrie Bucuresti", directed by Dr. Ana Aslan.

For this reason,there is a bioethical imperative that the Discipline should first be prevention, then return to physiology and finally to correction.

The worldwide diffusion and efforts of industries borne on the wave of the phenomenon have often led them to choose the fastest route to achieve and maintain the physical aspect in the myth of beauty at all costs, without considering that aesthetic is not synonymous with beauty, but a balance between body and mind, and that the role of the doctor is to take care of the person *in toto* and not simply to focus on the correction of "a badly accepted blemish".

Faithful to the teaching of my master almost 50 years ago, this new journal will have the task of elevating human resources, aligning and validating methodologies, but above all affirming the *humanitas* of the medical art in its purest sense so as to pursue the good and the graceful for the person who relies on it.

Fulvio Tomaselli, MD
Honorary President of the Italian
Society of Aesthetic Medicine

Aesthetic Medicine needs science. All over the world.

All Aesthetic Doctors know that science is the basis for safety. Safety is the most important issue in our discipline.

Unfortunately, Aesthetic Medicine is more often surrounded by marketing than by science, despite the hard work done by Scientific Societies all over the World. And too often, doctors working in this field are dealing with sellers that promote products based on inadequate scientific studies. However, they sell them anyway. I think that doctors need to learn that the first thing to ask about a medical device is the scientific background of that product: patients treated, follow-up period, adverse reactions and, above all, publications.

With this new International Journal wholly dedicated to Aesthetic Medicine, proposed by the Italian Society of Aesthetic Medicine, endorsed by UIME and shared by all the National Societies of Aesthetic Medicine belonging to UIME, World Aesthetic Medicine wishes to stimulate scientific production in this discipline so as to increase the safety and quality of aesthetic medical procedures.

Another important goal of the Journal is to serve as a catalyst for the proposal to set new protocols and guidelines in Aesthetic Medicine, with the consensus of the entire Aesthetic Medicine Scientific Community.

What this Journal should achieve in the near future is to improve the number and quality of scientific productions in Aesthetic Medicine, in order to allow this discipline to grow in the field of evidence-based medicine, not only in the rationale field.

I hope this can be the start of a new era for Aesthetic Medicine, with the commitment of all Scientific Societies worldwide.

Emanuele Bartoletti, MD
Managing Editor
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Society of Aesthetic Medicine

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Modern concept of the correction of skin aging problems

Vladimir Tsepkolenko

MD, PhD, Professor of the Faculty of Dermal and Venereal Diseases at Maxim Gorky National Medical University, Donetsk. General Director of the VIRTUS Ukrainian Institute of Plastic Surgery and Cosmetology, Odessa, Ukraine

ABSTRACT

The following concept of the problem of correcting aging skin is essentially based on skin stimulation and normalisation of its regenerative capabilities. We described the mechanisms that develop in the process of ageing dysregulated skin conditions. The course of regenerative processes is associated with a number of interrelated factors, which necessitate complex multicomponent therapy implying application of diverse techniques in consecutive stages.

We developed an algorithm for carrying out pathogenically well-grounded treatment procedures aimed at obtaining stable and pronounced therapeutic effects. This includes intradermal administration of hyaluronic acid (HA) for skin rehydration, application of plasma-enriched platelets (PRP) two weeks after HA injection to stimulate revascularisation, followed by ablative fractional photothermolysis to increase skin regeneration.

So only after achieving skin rehydration, with an increased growth factor content, is it possible to implement the techniques that allow the administration of autologous dermal fibroblasts. At the next stage, we recommend the use of cosmetological procedures that support the achieved effects; occasionally they are combined with procedures aimed at stimulating collagen synthesis.

Keywords
Skin, aging, plasma-enriched platelets, photothermolyses, fibroblasts

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Introduction

Skin aging is one of the most challenging issues, which has been currently studied not only by dermatologists and cosmetologists but also by specialists in the area of molecular biology, pathophysiology, genetics and other fields of medicine.

The loss of physical attractiveness with aging often causes decreased self-esteem and quality of life, especially regarding women at the age of 40-60 years old. It is this group of patients which is most interested in improving their appearance.

In most cases, the reason for the loss of attractiveness is caused by skin aging which is a multi-factor process. Natural skin aging is genetically determined and reflects the general biological process of a human organism, affecting all organs and tissues.

It depends on endogenous and exogenous factors. The first ones include changes in hormonal and immune status, chronic diseases and psycho-emotional stress. The second primarily refer to ultraviolet irradiation, climatic influence, nutrition and skin care habits. Exo- and endogenous factors normally work together. Involutional skin changes may manifest themselves differently with such signs as skin thinning, dryness, decreased turgor and elasticity, as well as varying degrees of wrinkle depth formation. Gravitation ptosis, focal and diffusive pigmentation, telangiectasias, angiomas and keratomas are also referred to as signs of aging.

The state of aging skin can be compared to the state of heart muscle affected by cardiac angina: in both cases the problem results from perfusion and oxygen deficiency. Figuratively speaking, wrinkles are the “angina” of skin. Treatment of skin muscle is intended to reconstruct its normal state and function. The same way, the very purpose of skin treatment (correction) is its reconstruction, and therefore the normalisation of regenerative processes, primarily addressing and removing the cause of aging skin disorder. Therefore, the central idea of the modern concept of involution skin changes correction is represented by the regenerative component, which is normalisation of the existing dysregulated skin state by means of affecting the key elements of skin aging pathogenesis.

The purpose of this work is the development of the skin aging changes correction algorithm. It requires identification of major skin cellular and intercellular space changes which are responsible for its aging, and then accordingly targeting the tasks that need to be resolved by means of such a correction.

Mechanisms that originate the dysregulated state

Factors that lead to involution dystrophic changes are well demonstrated in Figure 1.

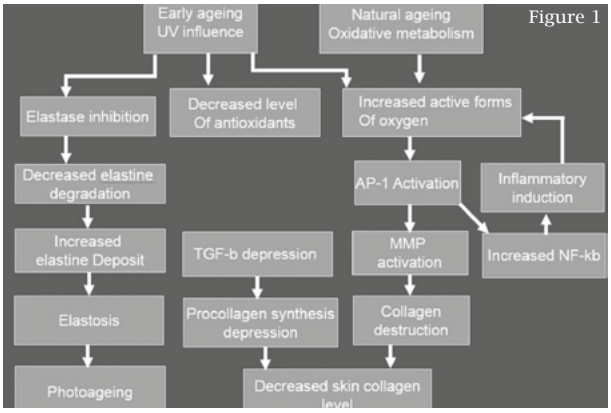


Figure 1

Figure 1 - Biochemical mechanisms of photoaging process (by Mekhta R., Fitzpatrick R., 2009[10]).

Imbalance between pro-oxidant and antioxidant systems

In practically all level 1 processes (Fig. 1) the major role is performed by means of the accumulation of free radicals-reactive oxygen species (ROS).

Free radicals provide support to oxidation-reduction homeostasis in an organism, produce responses to stress stimulation, stimulate immune reactivity, and participate in membrane permeability regulation, vascular tone, growth processes, differentiation, and the aging of cells and the overall organism. Positive role of free radicals. However, imbalance between pro-oxidant and anti-oxidant systems leads to oxidative stress.

If adaptive mechanisms fail, it will cause the development of a pathological state, which is determined by the interaction of pro-oxidant and antioxidant mechanisms. Under the influence of different stress-producing stimuli varying in quantity and quality, between cells, there is a considerable number of anti-oxidants united into functional antioxidant systems (FAS). FAS represents low molecular compounds that include vitamins such as A, C, E and K, bioflavonoids, thiols (glutathione and ergothioneine), aminoacids, peptides and proteins as well as anti peroxide enzymes (superoxide dismutase, glutathione peroxidase, glutathione reductase, catalase etc)[2].

Therefore, the balance between ROS and antioxidants is disrupted as a result of age-related decreased volumetric blood flow[3,4]. This leads to a decreased supply of antioxidants and dermal volume reduction.

Change of dermal volume

As is known, in contrast with skin, similar damage of well-hydrated mucosal tissues demonstrates a faster healing process while the inflammatory response is weaker along with a smaller number of scars.

The study managed to identify that constant support of high-level skin hydration improves post-traumatic regeneration, and its process resembles the healing process of damaged mucous layers[28].

The study examined gene expression depending on the state of skin hydration using microchip technologies. It showed different gene expressions responsible for production of IL-1β, IL-8,TNF-α (factor of tumour necrosis- α and COX-2 (cyclooxygenase 2), in cases of skin damage with various hydration levels. *In vitro* studies demonstrated increased expression of anti-inflammatory genes associated with recession of the level of human skin culture hydration. Hierarchical gene analysis by means of RNA interference shows that both TNF-α, and IL-1β regulate IL-8 expression via independent pathways in response to decreased hydration. Furthermore it was determined that inhibition of COX-2 mediates TNF-α/IL-8 pathways as a result of increased production of prostaglandin E2 (PGE2 whereas IL-8 controls production of matrix metalloproteinase-9 via keratinocytes.

The study brings us to the conclusion that the level of hydration directly influences the expression of inflammatory signals in the epidermis[28]. Therefore, the decrease of skin dermal volume and hydro reserve represents one of the most important links between pathogenesis and signs of aging changes.

Microcirculatory disorder

Microvasculature tone status is essentially influenced by hormonal and neurogenic factors. Estrogens affect the sympathetic nervous system, influencing 2- adrenoreceptors leading to vasospastic reactions. At a certain age, a woman's organism experiences decrease of estrogen and progesterone production. As a result volumetric blood flow falls. The vegetative nervous system influences microvasculature both directly and indirectly. Normally nonadrenalin is able to produce vasoconstrictor action able to affect β-1 adrenoreceptors; the vasodilation effect is intrinsic to adrenalin affecting 2- adrenoreceptors smooth muscle arteriola cells.

One of the causes of regional blood supply and microcirculation disturbance is endothelial dysfunction (reduction of nitrogen oxide release by vessel wall as well as its high degradation, active local endothelin-1 secretion or failure of its utilisation), which can lead to vasospasm, increased thrombus formation and a higher leucocyte adherence to endothelium. Vegetative dysfunctions promote dyscrasia and difficulties of organism adaptation to various environmental effects. Such processes result in skin texture disturbances, increased permeability of vascular walls and decreased epidermal barrier functions, and create conditions for skin inflammatory processes.

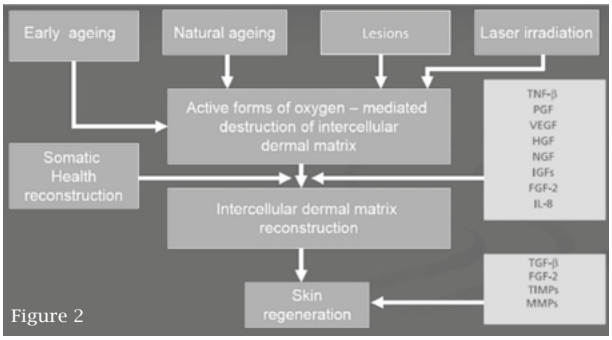


Figure 2 - Biochemical mechanisms of aging skin regeneration.

Therefore decreased blood flow not only represents the most essential link in developing imbalance between AOS and anti-oxidants but also leads to the limitation of nutrients' access to skin, thus causing structural dermal changes.

Imbalance between pro-inflammatory and anti-inflammatory cytokines

Wherever active oxygen species (AOS), superoxide-anion and hydrogen dioxide appear inside of skin, the number of free peroxy radicals leading to activation of several components that transmit signals to matrix metalloproteinases (MMP). Subsequently it stimulates protein_1 (AP_1) and nuclear transcription factor activation kB (NF-kB).[13,18,20–27] It is important to understand that activation NF-kB stimulates synthesis of such cytokines as TNF-α and interleukins IL-6,-8. Inflammation caused by them promotes increased formation of other cytokines and AOS. The effect of proteinases leads to elastin destruction because of inflammation along with accumulation of pathologic (damaged) elastin. Finally, this process results in degeneration of the surrounding collagen network.

Protein Acitvator-1 (PA-1) takes part in skin cells' metalloproteinases stimulation, thus promoting silencing of the procollagen gene-1 expression in fibroblasts. Therefore, it leads to destruction of fibrillar collagen type 1 and 3 by MMP-1 (collagenase). While stromelysins (MMP-3) and gelatinase (MMP-9) continue to destroy segmented pieces of tri-coil fibrillary collagen, FAS deactivates monoaminooxidase inhibitors. Therefore the process runs into a cycle, thus making natural skin reconstruction impossible. A fairly expected result of the described cascade of biochemical reactions was decreased procollagen synthesis, collagen synthesis failure, destruction of the extracellular skin matrix consisting of collagen fibres, and irregular deposition in skin of compromised incomplete elastin.

In the course of the placebo-controlled study of the issues of human skin collagen 1 PRP stimula-

tion, it was demonstrated that collagen 1 forms the basis for rebalancing between AFK and anti-oxidants by means of supplying skin with nutrients[11], which originate from PRP (platelet enriched plasma)[17].

Application of PRP technique attracted the attention of dermatologists and cosmetologists due to the fact that blood plasma enriched by platelets contains many different growth factors in granules such as PDGF, TGF, VEGF and IGF which are able to stimulate blood vessels, improving homeostasis and skin vascularisation[14].

Study of data on skin dysregulated conditions

The Virtus Institute undertook studies of data on skin dysregulated conditions in female patients between the ages of 45 and 55. The observational group was mostly made up of healthy women from 18 to 21 years old.

Injection site	Group of mostly healthy patients	Group of patients with skin Involution Dystrophic Changes
Epidermis thickness	67.9±2.1	93.7±1.8
Acoustic density	68.2±3.1	92.7±2.9
Dermis thickness	1809.6±33.2	1583.2±35.4
Cheek	0.0016	0.0014
	Blood flow rate (ml/c/cc)	
Forehead	0.0013	0.0011
Chin	0.0014	0.0012

Table 1 - Patients' skin morphological data and blood flow rate information in patients' groups.

It was discovered that in cases of dysregulated skin conditions, hydration was lower than in the observation group patients' skin. At the same time the maximal loss of 33.3% was observed in cheek skin. The forehead skin demonstrated a hydration decrease of 23.3%, temple skin 25.8%, and chin skin 23.6%. We also performed evaluation of morphometric skin data (table) by means of US exam. The study demonstrated that prior to the treatment, the epidermal thickness was 93.7±1.8 microns, acoustic density – 92.7 ±2.9 and n.u. dermal thickness - 1583.2 ± 35.4 microns.

Prior to treatment, volumetric blood flow (Qas) was equal to 0.0014 ml/cm/cc in cheek skin, and 0.0011 and 0.0012 ml/cm/cc in forehead and chin skin respectively.

Morphometric skin data in the group of women with an involution-dystrophic skin state was significantly different from those in the group of practically healthy young women (age from 18 to 21 y.o.):

- epidermis thickness — above 27.5%
- ($p< 0.05$); </284
- acoustic density — above 26.4%
- ($p< 0.05$); </288
- dermal thickness — less than 14.3% ($p< 0.05$) </291
- (table).

Therefore both literary data and the results of our own studies prove the conclusion that the key points of the skin aging process are related to:

- decreased skin hydro-resources;
- alterations in 3D skin organisation related to deceased levels of collagen, elastin and reticulin in derma;
- blood microcirculation disorders in skin;
- decreased number of fibroblasts and reduction of their biosynthetic activity as a result of low microcirculation and incoming volume of nutrients.

Algorithm for correction of disregulated skin conditions

In our view, the algorithm for correction of deregulated skin conditions should be constructed on the basis of the key moments of skin aging processes described above. They should determine the gradual course of correction and succession of cosmetological procedures.

Stage 1
Purpose – diagnostics of skin conditions, identification of patient's somatic problems.

1. Evaluation of skin state, its thickness and textural elements – sonography studies.
2. Estimation of blood velocity – Doppler scanning.
3. Patient's examination (general checkup, history taking) for the purpose of identification of somatic problems and primarily hormonal anomalies. If necessary, patients may be recommended to visit a competent specialist.

Stage 2
Purpose – restoration of dermal volume

1. Intradermal administration of hyaluronic acid

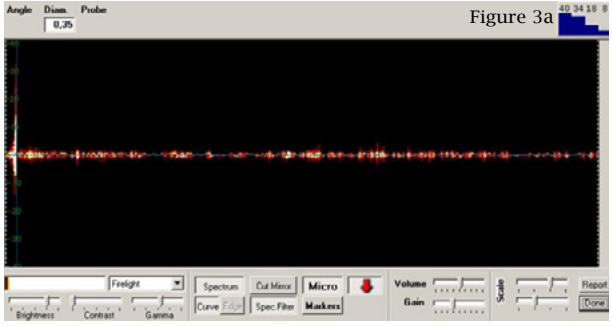
products aimed at normalisation of skin moisture content.
2. Skin tissue sampling from postaural area by means of punch biopsy for further extraction and culturing of autologous fibroblasts in biotechnological laboratory conditions.

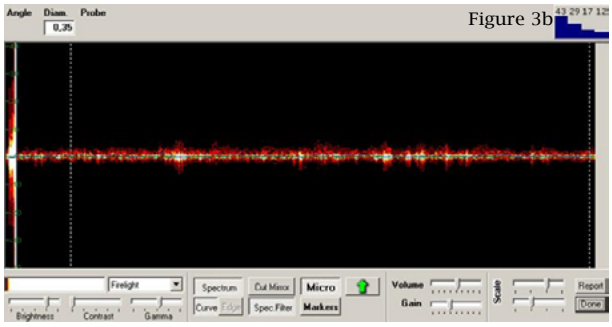
Stage 3
2 weeks following the 2nd stage.
The purpose is the recovery of microcirculation and balancing of pro- and anti-inflammatory systems.

1. Administration of growth factors enriched PRP in problem zones (Fig. 3).
2. Procedure of ablative fractional photothermolyses to stimulate skin regeneration as a result of controlled inflammation, that leads to renovation of skin microstructure[12,19].

Note. If the volumetric blood flow rate drops by 20-30% it is recommended to perform a combined procedure of PRP administration and ablative fractional photothermolysis. When volumetric blood flow decreases by up to 50%, we first inject PRP, which is followed by a combined procedure of PRP + ablative fractional photothermolysis two weeks later.

Figure 3 - Doppler skin image (view in progression) a – before, b – after platelet rich blood plasma infusion. Obvious increase of blood flow.





Stage 4
Performed two weeks after stage 3.
The purpose is the reconstruction of dermal microstructure.

1. Transplantation of autologous dermal fibroblasts by means of intradermal injections (from 30 to 60 mln. once depending on the degree of intensity of aging changes).

Note. Specifically at this stage, after all the necessary conditions for fibroblasts survival and functioning have been created, their administration promotes extracellular matrix formation. It is also reflected in the production of new collagen, leading to improved appearance of aging skin (Fig. 4).[15,16,5,6,9]

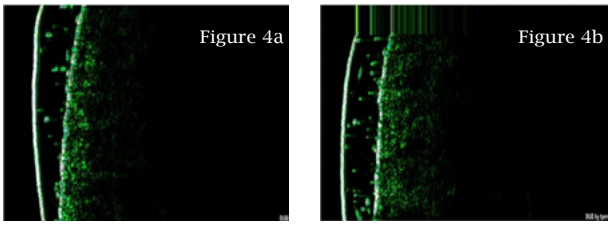


Figure 4 - Skin sonography in dynamics view: a – before, b – after regeneration procedures complex. There is increased density and echogenicity, increased dermal thickness as well as homogenous fibrous structure, which are more pronounced by the second month after treatment.

Stage 5
1 month after stage 4.
Purpose – to support the achieved results.

1. Demonstration of standard cosmetological procedures of skin care depending on its type (and phototype), aimed at retaining moisture, dermal volume and microcirculation.

Conclusion

The skin regeneration process represents complex and polycomponent therapy. Correction of skin health with involution-dystrophic changes is based on stimulation and normalisation of its regenerative capabilities.

The course of regenerative processes is determined by various interrelated factors that dictate complex and polycomponent therapy, implying gradual and successive application of competing methods. It includes intradermal injections of hyaluronic acid for skin rehydration, followed by administration of intradermal PRP two weeks afterwards to promote revascularisation along with fractional photothermolysis application to enhance skin regenerative processes.

Not until skin moisture saturation is reached, with an increase in the growth factor content, is it possible to use techniques that provide for the administration of autologous dermal fibroblasts. Afterwards it is recommended to perform cosmetological procedures to support the obtained results, sometimes combined with procedures aimed at stimulation of collagen synthesis. Such an approach allows reconstruction of normal skin functions and achieves a long-lasting clinical effect.

References

1. Akhtyamov SN, Butov US. Practical dermatocosmetology. Moscow: *Medicine*; 2003.
2. Gubsky UI. Biological Chemistry. Kyiv-Ternoryl: *Ukrmedbook*; 2000.
3. Yerofeyeva OV. Efficiency of laser-therapy application in complex correction of functional state of vascular endothelium in patients with hypoestrogenemic type of skin cover. *Photobiol. Photomed.* 2010; 1-2:54–60.
4. Yerofeyeva OV, Tsepkolenko VA, Bzita EF. Application of low intensity laser treatment in correcting microcirculatory anomalies in the course of involution-dystrophic skin changes. *Photobiol. Photomed.* 2009; 1:21–24.
5. Zorin VL, Zorina AI, Petrakova OS, et al. Dermal fibroblasts for skin defects treatment. Cell grafting and tissue engineering. 2008; 4:26–40.
6. Zorin VL, Zorina AI, Cherkasov VR. Qualitative and quantitative evaluation of facial skin conditions after autologous dermal fibroblasts application. *Aesthetic Medicine messenger*. 2011; V.10, 2: 16–28.
7. Zorin VL, Zorina AI, Cherkasov VR, et al. Method of correcting skin changes using autologous dermal fibroblasts. *Clinical dermatology and venereology*. 2013; 3:30–37.
8. Zorin VL, Zorina AI, Cherkasov VR. Autologous dermal fibroblasts in correction ageing and scarring skin defects. *Aesthetic medicine*. 2011; V. X, 2:173–179.
9. Zorina AI, Zorin VL, Cherkasov VR. Dermal fibroblasts: variety of phenotypes, physiological functions, possibilities of therapeutic application. *Cosmetics and medicine*. 2011; 2:12–24.
10. Mekhta P, Fitzpatrik R. Growth factors in cosmeceutics: role in skin regeneration. Consilium Medicum. 2009; 2:48–52.
11. Tsepklenko VA, Tsepkolenko AV, Karpenko ES. Photobiology and photomedicine. 2009; 2-3:68–74.
12. Brennan M, Bhatti H, Nerusu KC, et al. Matalloproteinase-1 is the major collagenolytic enzyme responsible for collagen damage in UV-irradiated human skin. *Photochem Photobiol*. 2003; 78(1):43-8.
13. Kim DH, Je YJ, Kim CD, et al. Can platelet-rich plasma be used for skin rejuvenation? Evaluation of effects of platelet-rich plasma on human dermal fibroblast. *Ann Dermatol*. 2011; 23(4):424-31.
14. Ellis CN, Weiss JS, Hamilton TA, Headington JT, Zelickson AS, Voorhees JJ. Sustained improvement with prolonged topical tretinoin (retinoic acid) for photoaged skin. *J Am Acad Dermatol*. 1990; 23(4 Pt 1):629-37.
15. Fisher GJ, Varani J, Voorhees JJ. Looking older: fibroblast collapse and therapeutic implications. *Arch Dermatol*. 2008; 144(5):666-72.
16. Franco D, Franco T, Schettino AM, Filho JM, Vendramin FS. Protocol for obtaining platelet-rich plasma (PRP), platelet-poor plasma (PPP), and thrombin for autologous use. *Aesthetic Plast Surg*. 2012; 36(5):1254-9.
17. Köhn-Luque A, de Back W, Yamaguchi Y, Yoshimura K, Herrero MA, Miura T. Dynamics of VEGF matrix-retention in vascular network patterning. *Phys Biol*. 2013; 10(6):066007.
18. Laubach H, Chan HH, Rius F, Anderson RR, Manstein D. Effects of skin temperature on lesion size in fractional photothermolysis. *Lasers Surg Med*. 2007; 39(1):14-8.
19. Millis AJT, Hoyle M, McCue HM, Martini H. Differential expression of metalloproteinase and tissue inhibitor of metalloproteinase genes in aged human fibroblasts. *Exp Cell Res*. 1992; 201(2):373-9.
20. Philips N. Counteraction of skin inflammation and aging or cancer by polyphenols. In Epifano F, editor. Anti-Inflammatory and Anti-Allergy Agents in Medicinal Chemistry. Bentham Science; 2010.
21. Philips N. Experimental physiology in anti-skin aging. In Skin Anatomy and Physiology Research Development, F. Columbus, Ed., Nova Science, 2009.
22. Philips N, Burchill D, O'Donoghue D, Keller T, Gonzalez S. Identification of benzene metabolites in dermal fibroblasts as nonphenolic: regulation of cell viability, apoptosis, lipid peroxidation and expression of matrix metalloproteinase 1 and elastin by benzene metabolites. *Skin Pharmacol Physiol*. 2004; 17(3):147-52.
23. Philips N, Conte J, Chen YJ, et al. Beneficial regulation of matrixmetalloproteinases and their inhibitors, fibrillarcollagens and transforming growth factor-β by Polypodium leucotomos, directly or in dermal fibroblasts, ultraviolet radiated fibroblasts, and melanoma cells. *Arch Dermatol Res*. 2009; 301(7):487-95.
24. Rijken F, Kiekens RC, Bruijnzeel PL. Skin-infiltrating neutrophils following exposure to solar-simulated radiation could play an important role

in photoageing of human skin. *Br J Dermatol*. 2005; 152(2):321-8.
25. Rijken F, Kiekens RC, van den Worm E, Lee PL, van Weelden H, Bruijnzeel PL. Pathophysiology of photoaging of human skin: focus on neutrophils. *Photochem Photobiol Sci*. 2006; 5(2):184-9.
26. Suzuki K, Nishi K, Takabuchi S, et al. Differential roles of prostaglandin E-type receptors in activation of hypoxia-inducible factor 1 by prostaglandin E1 in vascular-derived cells under non-hypoxic conditions. *PeerJ*. 2013; 1:e220.
27. Xu W, Jia S, Xie P, et al. The expression of proinflammatory genes in epidermal keratinocytes is regulated by hydration status. J *Invest Dermatol*. 2014; 134(4):1044-55.

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Enhancement of photodynamic therapy after peeling with glycolic acid: observational study

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ABSTRACT

Topical photodynamic therapy is a widely used non-invasive treatment for certain non-melanoma skin cancers, permitting treatment of large and multiple lesions with excellent cosmesis. The efficacy of this therapeutic strategy is demonstrated, using standardised protocols in non-hyperkeratotic actinic keratoses, Bowen's disease, superficial and certain thin nodular basal cell carcinomas, with superiority of cosmetic outcome over conventional therapies.

The aim of the study is to demonstrate how peeling with 70% glycolic acid before the treatment could lead to a higher penetration of aminolevulinic acid, increasing the therapeutic efficacy, in patients with signs of photoaging.

Keywords
Glycolic acid, photodynamic therapy

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Introduction

Topical photodynamic (PDT) has, to date, been approved for the treatment of certain non-melanoma skin cancers (NMSC)[1]. Currently, only three photosensitising agents are licensed for use in Europe.

Methyl aminolaevulinate (MAL) Metvix® (Galderma, Lausanne, Switzerland) is used along with red light to treat non-hyperkeratotic actinic keratoses (AK), Bowen's disease (BD), superficial and nodular basal cell carcinomas (BCC), although approvals vary between countries. A patch containing 5-ALA (Alacare®; Spirig AG, Egerkingen, Switzerland) is approved for the treatment of mild AK in a single treatment session in combination with red light, and BF-200 ALA (Ameluz®; Biofrontera AG, Leverkusen, Germany) is licensed for PDT in combination with red light. Another formulation of 5-ALA, Levulan® (DUSA Pharmaceuticals, Wilmington, MA, USA), is approved in North America and certain other countries for AK, using blue light[2].

PDT typically involves application of a topical photosensitiser, such as 5-aminolevulinic acid (5-ALA), which is activated by exposure to a visible light source. ALA is converted to protoporphyrin IX (PpIX) in the skin, which then preferentially accumulates in more rapidly proliferating cells. Free radicals are produced when PpIX is irradiated with visible light, causing injury to various cutaneous targets[3].

Protoporphyrin IX has its largest absorption peak in the blue region at 410 nm with smaller absorption peaks at 505, 540, 580 and 630 nm.

Most light sources for PDT seek to utilise the 630-nm red absorption peak, to improve tissue penetration. MAL-PDT is delivered using a standardised protocol of two treatments 1 week apart for BCC and BD, but with only one initial treatment for AK, repeated at 3 months only if required.

MAL is typically applied for 3 h, but Levulan® ALA, although licensed for an 18–24 h application, is widely used with shorter application intervals around 1 h.

A shorter 1-h incubation for MAL-PDT in AK is also an option with no significant difference in clearance rates when compared (1 h:76%, 3 h:85%)[1,2]. The response rates of PDT vary widely. A standardised protocol, with guidelines for the management of photoaging, does not yet exist. Hyperkeratosis is an important negative factor in ALA uptake.

Although in several studies various keratolytics have been used, to improve the effectiveness of PDT, to date there is not sufficient evidence to determine which is the best preparation for this treatment. This study wants to underline the importance of peeling with glycolic acid 70%, as preparation before PDT, to improve the results of this procedure.

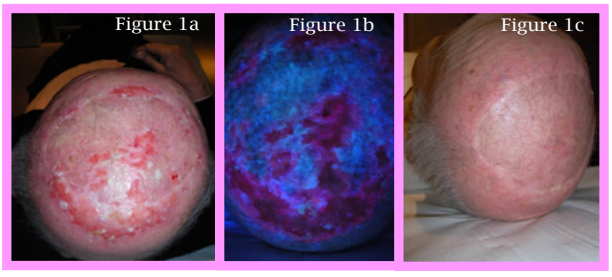
Material and Methods

Five patients (4F, 1M) with photoaging of the face, or the scalp or the décolleté (aged between 55 and 79 years old), were enrolled in this study. A 79-year-old male was treated on the scalp for severe photoaging, with many KA. Two women (72 and 73 years old respectively) were treated on the décolleté. Two women (55 and 58 years old respectively) were treated for mild photoaging of the face. In all patients dermographism was absent and Ramette's test was negative. Personal anamnesis was negative for porphyria or xeroderma pigmentosum. Patients were required to apply a 15% glycolic acid gel to the cutaneous area every evening for two weeks before PDT, to obtain a reduction of corneum stratum, leading to major ALA penetration. The day before treatment, obtained the patient consent form, a peeling with 70% glycolic acid was made. An anti-inflammatory non-steroid cream and a sun cream protection were applied.

The day after, to improve the ALA absorption, before applying cream, hyperkeratotic lesions were curettaged (Fig. 1a) and a layer (about 1 mm) of 160 mg/g ALA cream was applied on the cutaneous area, which was covered for three hours with a plastic mask. After 3 hours, the dressings were removed and field cancerisation was seen through Wood's lamp examination (Fig. 1b). This area was treated with red light at a wavelength of 630 nm (S.630 Alpha Strumenti), light dose of 37 J/cm² , light intensity 70 mW/cm² for ten minutes.

Patients were treated without intralesional anesthesia and they only reported mild localised pain and burning sensation during light exposure. Patients were subjected to three PDT every two weeks. After three months from the first treatment, patients saw improvement in the clinical situation. Especially the elderly male with severe photo damaged scalp saw notable improvement with remission of the clinical situation (Fig. 1c).

Figure 1a - Scalp photoaging with many KA.
Figure 1b - Three hours after ALA application (Wood's lamp).
Figure 1c - One month after the third treatment of PDT.



Discussion

Several treatment options exist for AK and BCC and photoaging, including peeling, cryotherapy, diathermocoagulation, surgical excision, argon or YAG lasers[4]. Intralesional therapy with methotrexate and 5-fluorouracil, topical treatment with imiquimod, and systemic therapy with retinoids and methotrexate have also proved effective; however, recurrences and scars often occur. When regular curettage or excision is performed, risk of recurrence is 4%-8%. PDT has, to date, been approved for the treatment of certain NMSC [1], but has also been examined as a treatment for conditions ranging from acne to superficial skin cancers to the signs of photoaging [5]. In studies on the treatment of extensive AK it was observed that after PDT, not only did AK regress, but signs of skin aging also appeared markedly improved. Numerous clinical studies in the meantime were able to confirm these observations[6]. The mode of action of PDT is not still completely understood. In literature an increase of cutaneous thickness[7] and changes of collagenous production[8] after PDT are reported. Skin biopsies made before and after PDT have revealed an increase of type I collagen in the dermis. Histological changes have been studied, making skin biopsies before and after 1 month from PDT with ALA with red light [9]. Issa et al. have demonstrated a reduction of elastic fibers and an increase of collagen fibers after 6 months of PDT with MAL[10]. Moreover a reduction of epidermis thickness, of dermal elastosis and of dermal inflammatory infiltrate, as an increase of type I and III collagen and procollagen in superficial dermis were observed. TGF-β, that stimulates fibroblastic proliferation and increases collagen synthesis, was increased after PDT, as receptor for TGF-β. To obtain these good clinical results, many treatments are required, because increase of mRNA of procollagen I and III happens after 30 days from PDT and decreases after 60 days. Bagazgoitia et al. have evidenced that p53 expression, an early marker of carcinogenesis, is not expressed in the normal skin, but is significantly reduced after PDT[11]. Therefore PDT can reconvert the carcinogenesis process in the photodamaged skin. In this work, patients were subjected to 3 PDT, and before and after the treatment, were subjected to a skin biopsy. In all patients, global score for photoaging was significantly improved. Histologically a significant reduction in grade and extension of cellular atypia, an increase in collagen and a reduction in solar elastosis were observed. This study has suggested that PDT, through a reduction of cellular atypia and P53 expression, led to a reduction of carcinogenetic potential in the photodamaged skin.

Molecular alteration after PDT with MAL® with red light has also been studied in the animal model[12]. Two days after PDT in murine skin, great production of proinflammatory cytokines, such as IL-1β, TNFα, TGF-β1, MMP-1 (the most important metalloproteinase, that degrade collagen type I), MMP-2, MMP-3 and MMP-9, was induced. Histologically necrotic alterations in the epidermis were present one day after PDT, epidermis regeneration and dermis inflammatory infiltrate 2 days after PDT and a complete restitutio ad integrum of epidermis after 4 days. After 8 days the epidermis was thicker and after 12 days collagen fibres were significantly thicker. Procollagen I and III mRNA was significantly increased after 12 days from PDT. In conclusion many studies have demonstrated that PDT induces a collagen increase and a solar elastosis reduction. ALA-PDT confers a significant preventive potential against the formation of new NMSCs[13,14].

A big limitation for PDT is the hyperkeratosis, that reduces MAL penetration, reducing the efficacy of the treatment. Some authors have tried to increase MAL penetration by adding glycolic acid on cellular lines in vitro, on animals and patients affected by spinocellular carcinomas, obtaining a faster regression. The use of glycolic acid before the treatment with PDT could be considered an agent that increases ALA penetration in the skin, increasing PDT efficacy[15]. Pretreatment of hyperkeratosis can be achieved with keratolytics, curettage, microdermabrasion or laser ablation. Penetration enhancers may alter the composition or organisation of the intercellular lipids of the stratum corneum. Several studies have been performed on the use of dimethyl sulphoxide, glycolic acid, oleic acid and iontophoresis to increase the penetration of ALA. Recently, the relevance of pretreating hyperkeratosis and the corneal layer of the skin before PDT was reported in the literature[16]. Ziolkowski P. et al. reported the enhancement of photodynamic therapy by use of an aminolevulinic acid/glycolic acid drug mixture[17].

Therefore using glycolic acid before PDT could be useful to enhance the penetration of ALA, to obtain the best possible result. In our study the aim was to increase the penetration of 5-ALA through the skin, by applying a gel composed of glycolic acid every night for two weeks and peeling with 70% glycolic acid the day before PDT. The treatment showed a rapid regression of skin lesions, improving grade of photoaging, without flare-up of the skin lesions after 10 months of follow-up. These results provide evidence that addition of glycolic acid enhances 5-ALA penetration in tissues, increasing PDT efficacy. Therefore PDT could be considered a safe treatment, without any side effects for the patients. Even though many therapeutic approaches are available, PDT has a therapeutic effect both on clinical visible KA and on subclinical KA, also improving the aesthetic aspect of skin.

Glycolic acid increases the penetration of ALA. The substance used to increase ALA penetration

must not alter the biochemical features of ALA. At present there are no guidelines for the management of photoaging. In conclusion, PDT could be considered a safe, non-invasive, easy-to-use treatment, without any inconvenience for the patient. Due to the small number of patients in our study and the absence of randomised clinical trials, more research is necessary to clarify how PDT could contribute to skin rejuvenation.

References

1. Morton CA, Szeimies RM, Sidoroff A, Braathen LR. European guidelines for topical photodynamic therapy part 1: treatment delivery and current indications – actinic keratoses, Bowen's disease, basal cell carcinoma. *J Eur Acad Dermatol Venereol*. 2013; 27(5):536-44.
2. Morton CA, McKenna KE, Rhodes LE; British Association of Dermatologists Therapy Guidelines and Audit Subcommittee and the British Photodermatology Group. Guidelines for topical photodynamic therapy: update. *Br J Dermatol*. 2008; 159(6):1245-66.
3. Allison RR. Photodynamic therapy: oncologic horizons. *Future Oncol*. 2014; 10(1):123-4.
4. Nashan D, Meiss F, Müller M. Therapeutic strategies for actinic keratoses - a systemic review. *Eur J Dermatol*. 2013; 23(1):14-32.
5. Orringer JS, Hammerberg C, Hamilton T, et al. Molecular effects of photodynamic therapy for photoaging. *Arch Dermatol*. 2008; 144(10):1296-302.
6. Karrer S, Kohl E, Feise K, et al. Photodynamic therapy for skin rejuvenation: review and summary of the literature - results of a consensus conference of an expert group for aesthetic photodynamic therapy. *J Dtsch Dermatol Ges*. 2013; 11(2):137-48.
7. Zane C, Capezzera R, Sala R, Venturini M, Calzavara-Pinton P. Clinical and echographic analysis of photodynamic therapy using methylaminolevulinate as sensitizer in the treatment of photodamaged facial skin. *Lasers Surg Med*. 2007; 39(3):203-9.
8. Marmur ES, Phelps R, Goldberg DJ. Ultrastructural changes seen after ALA-IPL photorejuvenation: a pilot study. *J Cosmet Laser Ther*. 2005; 7(1):21-4.
9. Park MY, Sohn S, Lee ES, Kim YC. Photorejuvenation induced by 5-aminolevulinic acid photodynamic therapy in patients with actinic keratosis: a histologic analysis. *J Am Acad Dermatol*. 2010; 62(1):85-95.
10. Issa MC, Piñeiro-Maceira J, Vieira MT, et al. Photorejuvenation with topical methyl aminolevulinate and red light: a randomized, prospective, clinical, histopathologic, and morphometric study. *Dermatol Surg*. 2010; 36(1):39-48.
11. Bagazgoitia L, Cuevas Santos J, Juarranz A, Jaén P. Photodynamic therapy reduces the histological features of actinic damage and the expression of early oncogenic markers. *Br J Dermatol*. 2011; 165(1):144-51.
12. Choi JY, Park GT, Na EY, Wi HS, Lee SC, Lee JB. Molecular changes following topical photodynamic therapy using methyl aminolevulinate in mouse skin. *J Dermatol Sci*. 2010 ;58(3):198-203.
13. Apalla Z, Sotiriou E, Chovarda E, Lefaki I, Devliotou-Panagiotidou D, Ioannides D. Skin cancer: preventive photodynamic therapy in patients with face and scalp cancerization. A randomized placebo-controlled study. *Br J Dermatol*. 2010; 162(1):171-5.
14. Wulf HC, Pavel S, Stender I, Bakker-Wensveen CA. Topical photodynamic therapy for prevention of new skin lesions in renal transplant recipients. *Acta Derm Venereol*. 2006; 86(1):25-8.
15. Ziolkowski P, Osiecka BJ, Oremek G, et al. Enhancement of photodynamic therapy by use of aminolevulinic acid/glycolic acid drug mixture. *J Exp Ther Oncol*. 2004; 4(2):121-9.
16. Gerritsen MJ, Smits T, Kleinpenning MM, van de Kerkhof PC, van Erp PE. Pretreatment to enhance protoporphyrin IX accumulation in photodynamic therapy. *Dermatology*. 2009; 218(3):193-202.

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Soft tissue augmentation with cross-linked carboxymethylcellulose filler: efficacy and safety profile

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ABSTRACT

Objective: To assess the efficacy and safety of CMC filler in the rejuvenation of the lower face.

Materials and methods: 154 procedures were performed in 73 patients: 63 nasolabial folds, 39 marionette lines, 16 bar codes, 9 cheek rhytides and 27 lip rejuvenations. All patients were evaluated immediately after the procedure (T1) and at 3 months (T2) with photographic evaluation, Global Aesthetic Improvement Scale (GAIS), Modified Fitzpatrick Wrinkle Scale (MFWS) for nasolabial folds and Medicis Lip Fullness Scale (LFS) for lips. Side effects were recorded.

Results: GAIS was significantly satisfactory in all patients in both T1 and T2, as it was ≥ 2 in 70%. Before treatment, MFWS was class 1.5 o 2 in 41/63 and significantly improved in both T1 and T2 (class ≤ 1 in 53/63 and 49/63 respectively, $p < 0.001$). Treatment of lips produced an improvement ≥ 1 grade of MLFS in all cases in T1 and in 25/27 cases in T2 ($p < 0.001$). 11 cases of ecchymosis were recorded after the procedures, no local oedema, erythema or nodules.

Conclusions: The use of CMC filler resulted in a significant and satisfactory amelioration of lower face aging signs with very low incidence of adverse events.

Keywords
Cross-linked carboxymethylcellulose, tissue augmentation, lip augmentation, efficacy, safety

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Introduction

In Europe and the United States, aesthetic medicine is on the rise, and injectable fillers are one of the cornerstones of the treatment of signs of aging.

The first heterologous human implant of paraffin was performed in 1889 and the use of liquid silicone started in the late 1960s[1,2].

Since then many dermal fillers have been employed to reduce facial wrinkles and to enhance lip volume. Hyaluronic acid (HA) is one of the most widely used[3,4].

In 2003 the first HA filler was approved in the US by the FDA for correction of soft tissue, and since then its use has grown by 70%.

Although HA fillers are non-toxic and non-immunogenic, hypersensitive reactions and foreign body granulomatous reactions have been reported[5].

Carboxymethylcellulose (CMC) is a biosynthetic substance used in food science as a viscosity modifier or thickener already present in some dermal fillers as carrier or filling[6,7].

The non-bacterial, non-animal origin of CMC and its anti-inflammatory activity confer unique properties on this product[8,9,10].

Since 2012 a transparent CMC hydrogel cross-linked by 1,4-butanediol diglycidyl ether (BDDE) has been approved for soft tissue augmentation and wrinkle correction[11].

The aim of the present study was to prospectically evaluate the efficacy and safety of cross-linked CMC filler for rejuvenation of the lower face.

Materials and Methods

All patients with moderate to severe nasolabial folds (zone 1), marionette lines (zone 2), bar code (zone 3), cheek rhytides (zone 4) or loss of lip volume (zone 5) were enrolled in this study for a 3-month period.

Exclusion criteria were pregnancy or breastfeeding, age under 18 years, ongoing anticoagulant or antiplatelet therapy, previous radiotherapy or burn scars in the region of treatment, ongoing local infections or inflammations, and use of injectable fillers during the previous 6 months or previous use of permanent fillers at any time. All patients gave their written informed consent and agree to avoid to undergo other aesthetic procedures in the treated area for the period of the study.

Procedures were preceded by asepsis with 70% alcoholic solution. A conservative approach was performed to avoid hypercorrection.

CMC filler was injected in the mid-deep dermis with the needle packed with the syringe.

CMC filler was injected in the mid-deep dermis through a sharp needle packaged with the syringe. Needles were sized relative to the crosslinking and concentration of the filler. As CMC can be cross-linked by varying pH, temperature, concentration and BDDE concentration, three formulations of CMC filler differing in degree of crosslinking and concentration of CMC were used. Lower cross-linked CMC filler was injected through a smaller bore needle (30 gauge) whereas higher cross-linked CMC fillers required a 27 gauge needle.

Nasolabial folds (zone 1) were treated with a linear threading technique. The needle was typically inserted at the inferior border of the fold and advanced superiorly toward the alar-facial junction. When the fold was very deep, two layering parallel lines were injected.

Marionette lines (zone 2) were treated by a linear or serial puncture technique with injection in the deep dermis. When loss of volume was found in the area surrounding labial commissures, a cross-hatching technique was performed to restore volume in this area.

Bar code (zone 3) was treated by a serial puncture technique followed by a massage to precisely distribute the filler. Some patients had a very superficial bar code, only visible during the contraction of orbicular muscle: in these cases injection was deep in the dermis.

Cheek rhytides were treated with a fan technique with a very tiny amount of filler.

Lip treatment (zone 5) in young patients is often related to volume enhancement of this region: a linear technique was performed, or serial puncture from medial parts to lateral.

In the older population lip rejuvenation was performed: contour redefinition with Paris lip technique and restoration of the normal anatomy of labial commissures. A minimal volume was used in order to maintain a natural appearance of the area.

Before and after pictures of all patients were taken in the same lighting conditions with a 14 megapixel photocamera.

Patients were evaluated for amelioration of every treated area, with a separate evaluation for upper and lower lip, with the Global Aesthetic Improvement Scale (GAIS) giving a score of very much improved (+3), much improved (+2), improved (+1), no change (0), worse (-1), much worse (-2) or very much worse (-3).

Validated scales were used to evaluate nasolabial folds and lips. The Medicis Lip Fullness Scale (MLFS) with photoguide was applied separately for upper and lower lip, with a 5-point score for lip volume: very thin (1), thin (2), medium (3), full (4) and very full (5)[12].

The Modified Fitzpatrick Wrinkle Scale (MFWS) was used to quantify depth of nasolabial folds: no wrinkle (class 0), very shallow wrinkle (class 0.5), shallow wrinkle (class 1), wrinkle less than 1 mm

deep (class 1.5), wrinkle 1-2 mm deep (class 2), wrinkle 2-3 mm deep (class 2.5), or wrinkle more than 3 mm deep (class 3)[13].

To avoid non-optimal concordance between photographic evaluation and *in vivo* evaluation, MFWS and MLFS were uniquely applied to the analysis of photographic documents.

Adverse events (oedema, erythema, ecchymosis and nodules) were recorded immediately after the procedure (T1) and at 3 months (T2).

Statistical Analysis

Qualitative data were described using frequencies and percentages. Quantitative data were described using median values and interquartile ranges (IQR). In the comparison among different subgroups, quantitative variables were handled by using Student's or Wilcoxon Rank Sums tests, and categorical variables using $\chi 2$ or Fisher's exact tests or Friedman's test for correlated non-parametric categorical variables as appropriate. Statistical significance was set at $p < 0.05$. The calculations were performed with the JMP package (1989–2003 SAS Institute Inc.).

Results

Between June and September 2013, 73 patients were prospectively enrolled and 154 procedures were performed. The study population comprised 70 females and 3 males, whose median age was 54 ± 11.

63 patients underwent correction of nasolabial folds (zone 1) (figure A). 39 patients had treatment of marionette lines (zone 2) (figure B), 16 bar code (zone 3) (figure C), 9 cheek rhytides (zone 4) (figure D) and 27 lips (zone 5) (figure E).

Three months after the treatment (T2) all patients self-reported a significant improvement, being GAIS ≥ 2 in 92% of the subjects in zone 1, 2, 3 and 4.

GAIS was ≥ 2 at T1 and T2 for upper lip in 91% of patients and GAIS was ≥ 2 in 93% of patients at T1 and 91% of patients at T2 for lower lip.

Before the procedure, the median MLFS was 3 ± 1 for upper and lower lip; after the procedure it was 3 ± 1 and 4 ± 1 at T1 and T2. 21 out of 27 patients (77.8%) were classified as class 2 and 3 for upper lip and 18 out of 27 (66.7%) were between class 1 and 3 for lower lip. Lip correction produced an amelioraton of ≥ 1 grade in all cases in T1 and in 25 out of 27 cases (92.6%) in T2 ($p < 0.001$).

Immediately after the procedure 11 cases of ecchymosis were recorded which lasted up to 24-36 hours. No local oedema or erythema after the procedure. No nodules, infections, migration or Tyndall effect were reported during the follow-up.

Figure 1a - Before treatment of nasolabial folds
Figure 1b - 3 months after treatment of nasolabial folds

Figure 2a - Marionette lines before treatment
Figure 2b - Marionette lines 3 months after treatment

Figure 3a - Before treatment of bar code
Figure 3b - 3 months after treatment of bar code

Figure 4a - Before treatment of cheek rhytides
Figure 4b - 3 months after treatment of cheek rhytides

Figure 5a - Before treatment of lip rejuvenation
Figure 5b - 3 months after treatment of lip rejuvenation

Discussion

The ideal filler should be efficacious in reducing wrinkles and plumping the tissues without making them look unnatural, be easy and safe to introduce into the tissues, have a long-lasting effect, be relatively inert and not incite a painful or bulky tissue response[4,14].

Non-permanent or degradable fillers are generally made up of naturally-occurring biological agents such as collagen or hyaluronic acid that undergo degradation at variable rates[4]. Collagen dermal fillers are available in the form of bovine collagen and human-based collagen[15]. HA is a non-sulphated glycosaminoglycan polysaccharide composed of repeating disaccharide units of glucuronic acid and N-acetylglucosamine. HA is a major and natural component of the extracellular matrix in all animal tissues produced by mesenchymal cells with no organ or species specificity; as such, there is no risk of immunogenicity and it is non-toxic and biocompatible. It is highly hydrophilic and this property helps it to retain water and occupy larger volumes relative to its mass[16].

HA fillers have been used to eliminate skin aging signs such as nasolabial fold and cheek wrinkles, as well as perioral rhytides and marionette lines. Such fillers may also be used for lip filling or contouring

and chin and cheek augmentation[17].

At the beginning of its aesthetic clinical use there were two main commercial forms of HA: Hyaloform (Biomatrix, USA), derived from cocks' combs and Restylane (Q Med, Uppsala, Sweden) which is produced by microbiologic engineering techniques (generated by Streptococcus equi)[18]. This latter product is more resistant to early degradation by hyaluronidase and rendered more water-insoluble because of cross-linkage. Since then, many other commercial forms of cross-linked bacteria-derived HA fillers have been developed.

As an innovation, since 2006, CMC has been used as the main component of filler to correct wrinkles. First, the CMC was used in the non-crosslinked free form combined with polyethylene oxide (Laresse, FzioMed Inc, USA) and showed good efficacy and safety with long-lasting results. From 2012 CMC has been marketed a single component as cross-linked filler. In this study, for the first time we prospectively evaluated the efficacy and safety of CMC filler for the correction of signs of aging of the lower third face in a cohort of patients.

All patients experienced a very high rate of satisfaction of treated regions at 3 months which persisted at a very high rate at 6 months with more than 80% having high and very high satisfaction with the procedure independently from the treated region. This rate of satisfaction was even higher in the lip enhancement group. These results were comparable with those of new HA and are much superior to Restylane in a Brazilian study of 1446 consecutive patients treated in up to four areas of the face [19].

By using objective assessment, cross-linked CMC filler showed 100% of at least 1 point of increase in MLFS at 3 months (T2). A less effective response of 70% was seen on the 5-point MLFS at week 24 with Restylane and of 80% with the Volbella™ study and of 40% with Juvéderm®[20].

Cross-linked CMC filler demonstrated a very good safety profile, with 0.7% of ecchymosis immediately after the procedure, in keeping with the previous study by Leonardis et al. This very low percentage of collateral effects is lower than usually reported with HA. Adverse reactions to HA consisting primarily of localised hypersensitivity reactions and injection site inflammation are uncommon and local, and transient side effects are injection site reactions such as pain, mild to moderate oedema, ecchymoses and haematoma; palpability, hypercorrection, and bluish discoloration may also occur secondary to superficial injection of the implant and inappropriate technique. The incidence of such reactions has been documented in approximately 2% of treatments for HA [21]. The most common early or immediate, non-allergic reaction to CMC compared to HA can be due to the non-bacterial non-animal nature of this filler, and this can be responsible for the very low total number of adverse events with this filler along with the absence of some peculiar effects of HA such as bluish discoloration. Post-marketing 5-year analysis with HA by the FDA up to 2008 described 930 adverse events, inflammation, allergy and infection being among the top 5 causes. Lack of inflammation and hypersensitivity occur in 0.05–0.15% of cases[22].

Delayed adverse reactions to HA include hypersensitivity and granulomatous foreign body reaction that occur in up to 0.6% of cases [23]. This may result from the reactivity of some patients to protein residues of bacterial or avian origin or impurities and residual 1,4-butanediol diglycidyl ether (BDDE) from the cross-linking process. Few cases of hypersensitivity and foreign body reaction have been documented, usually developing within 6–24 months[24,25]. To date, 3 cases of nodule formations after Restylane injection have been reported in the literature[26]. Such persistence may be related to the cross-linking process, which makes Restylane more resistant to breakdown.

Another advantage of CMC over HA may be the nature of the synthetic polymer, which is characterised by a very low concentration of residual BDDE which is used for crosslinking[27]. Residual concentration of BDDE in all the three forms of cross-linked CMC is lower than 0.5 PPM, compared to 1-2 PPM of hyaluronic acids.

In conclusion, CMC filler has been demonstrated to be very effective in the correction of signs of aging of the lower face with a very high rate of satisfaction compared to the cross-linked HA fillers and a long-lasting effect. Safety profile seems to be another advantage of this filler, with a lack of some side effects which are peculiar to cross-linked HA fillers, and a reduced dose of BDDE.

Therefore cross-linked CMC filler can be a perfect candidate for use by professionals in their everyday clinical practice.

References

1. Kontis T, Rivkin A. The history of injectable facial fillers. *Facial Plast Surg*. 2009; 25(2):67-72.
2. Webster RC, Fuleihan NS, Hamdan US. Injectable silicone: report of 17,000 facial treatments since 1962. *Am J Cosmet Surg*. 1986; 3:41-48.
3. Matton G, Anseeuw A, De Keyser F. The history of injectable biomaterials and the biology of collagen. *Aesthetic Plast Surg*. 1986; 60:898-905.
4. Fernandez EM, Mackley CL. Soft tissue augmentation: a review. *J Drugs Dermatol*. 2006; 5(7):630-41.
5. Beasley KL, Weiss MA, Weiss RA. Hyaluronic acid fillers: a comprehensive review. *Facial Plast Surg*. 2009; 25(2):86-94.
6. Courtois JE, Bui Khac Diep. Research on the de-

termination of cellulases and hemicellulases in pharmaceutical preparations. II. Preparation and analytical inspection of carboxymethylcellulose. *Ann Pharm Fr*. 1965; 23(11):649-62.
7. Johnson CL, Rich TD. Evaluation of carboxymethylcellulose as an injectable carrier for follicle-stimulating hormone. *J Anim Sci*. 1973; 36(2):375-9.
8. Kaputskiĭ VE, Sobeshchuk OP, Adarchenko AA, Krasil'nikov AP. Antimicrobial properties of fibrous cellulose and other polymeric materials modified with chlorhexidine. *Antibiot Khimioter*. 1991; 36(9):5-7.
9. Falcone SJ, Doerfler AM, Berg RA. Novel synthetic dermal fillers based on sodium carboxymethylcellulose: comparison with crosslinked hyaluronic acid-based dermal fillers. *Dermatol Surg*. 2007; 33 Suppl 2:S136-43; discussion S143.
10. Bravo V, Paez MP, El-Hadj MA, Reyes A, Garcia AL. Hydrolysis of carboxymethylcellulose with mixtures of cellulase and B-1,4-glucosidase. *J Chem Technol Biothechnol*. 2001; 77:15-20.
11. Leonardis M, Palange A, Dornelles RF, Hund F. Use of cross-linked carboxymethyl cellulose for soft-tissue augmentation: preliminary clinical studies. *Clin Interv Aging*. 2010; 5:317-22.
12. Kane MA, Lorenc ZP, Lin X, Smith SR. Validation of a lip fullness scale for assessment of lip augmentation. *Plast Reconstr Surg*. 2012; 129(5):822e-8e.
13. Shoshani D, Markovitz E, Monstrey SJ, Narins DJ. The Modified Fitzpatrick Wrinkle Scale: a clinical validated measurement tool for nasolabial wrinkle severity assessment. *Dermatol Surg*. 2008; 34 Suppl 1:S85-91; discussion S91.
14. Romagnoli M, Belmontesi M. Hyaluronic acid-based fillers: theory and practice. *Clin Dermatol*. 2008; 26(2):123-59.
15. Landau M. Lip augmentation and rejuvenation using a novel, porcine collagen-derived filler. *J Drugs Dermatol*. 2008; 7(3):236-40.
16. Duranti F, Salti G, Bovani B, Calandra M, Rosati ML. Injectable hyaluronic acid gel for soft tissue augmentation. A clinical and histological study. *Dermatol Surg*. 1998; 24(12):1317-25.
17. Sclafani AP. Soft tissue fillers for management of the aging perioral complex. *Facial Plast Surg*. 2005; 21(1):74-8.
18. Nast A, Reytan N, Hartmann V, et al. Efficacy and durability of two hyaluronic acid-based fillers in the correction of nasolabial folds: results of a prospective, randomized, double-bind, actively controlled clinical pilot study. *Dermatol Surg*. 2011; 37(6):768-75.
19. Bosniak S, Cantisano-Zilkha M, Glavas IP. Nonanimal stabilized hyaluronic acid for lip augmentation and facial rhytid ablation. *Arch Facial Plast Surg*. 2004; 6(6):379-83.
20. Eccleston D, Murphy DK. Juvederm Volbella in the perioral area: a 12-month prospective, multicenter, open-label study. *Clin Cosmet Investig Dermatol*. 2012; 5:167-72.
21. Duffy DM. Complications of fillers: overview. *Dermatol Surg*. 2005; 31(11 Pt 2):1626-33.
22. Mamelak AJ, Katz TM, Goldberg LH, Graves JJ Kaye VN, Friedman PM. Foreign body reaction to hyaluronic acid filler injection: in search of an etiology. *Dermatol Surg*. 2009; 35 Suppl 2:1701-3.
23. Rongioletti F, Cattarini G, Sottofattori E, Rebora A. Granulomatous reaction after intradermal injections of hyaluronic acid gel. *Arch Dermatol*. 2003; 139(6):815-6.
24. Requena L, Requena C, Christensen L, Zimmermann US, Kutzner H, Cerroni L. Adverse reactions to injectable soft tissue fillers. J *Am Acad Dermatol*. 2011; 64(1):1-34.
25. Andre P, Lowe NJ, Parc A, Clerici TH, Zimmermann U. Adverse reactions to dermal fillers: a review of European experiences. *J Cosmet Laser Ther*. 2005; 7(3-4):171-6.
26. Shahrabi Farahani SS, Sexton J, Stone JD, Quinn K, Woo SB. Lip nodules caused by hyaluronic acid filler injection: report of three cases. *Head Neck Pathol*. 2012; 6(1):16-20.
27. Jolanki R, Estlander T, Kanerva L. Contact allergy to an epoxy reactive diluent: 1,4-butanediol diglycidyl ether. *Contact Dermatitis*. 1987; 16(2):87-92.

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Nutrition in women between prevention and wellness

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ABSTRACT

Women have always shown great interest in food and health problems, which is why they have great knowledge of nutrition. Usually they tend to choose healthier and lighter foods and to maintain dietetic habits in order to achieve a better physical appearance. However, women have particular nutritional necessities, and these needs change in the different phases of their lives. Paying attention to adequate iron assumption is a key to woman's health, together with a correct folic acid intake above all during childbearing age and pregnancy, to reduce the risk of congenital malformations in newborn babies. Calcium intake is basic in the first decades of women's lives (20-30 years) in order to reach peak bone mass, and later during the menopause to prevent fractures and osteoporosis. Therefore nutrition in women should guarantee the intake of all the micro and macro nutrients, adapted to her specific needs and accompanied by regular physical activity. A balanced and healthy diet helps to prevent cardiovascular, cutaneous and neurological disease (like Alzheimer's disease) and to maintain a beautiful appearance. Finally it appears that healthy and balanced nutrition helps, in particular during menopause, to improve optimism and positivity in the fairer sex.

Keywords
Nutrition, women, wellness

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Introduction

Women have always shown great interest in food and health problems, which is why they have great knowledge of nutrition, as confirmed by the majority of the studies done to test nutritional skills. Activities related to food purchase, preparation and consumption have always been considered female-centred.

The European Nutrition and Health Report 2009 examined the dietary intake of 22 European countries and it showed that women usually have a greater consumption of carbohydrates compared to men, who instead consume larger amounts of alcohol and often choose more high-calorie foods.

Women in general usually tend to choose healthier and lighter foods and to maintain dietetic habits in order to achieve a better physical appearance. They also tend to consume greater amounts of fruit, vegetables, foods rich in fibre, phytochemicals and micronutrients which prevent weight gain, cancer and cardiovascular diseases.

In support of the previous data we report a survey conducted on the web by ADI (Italian Association of Dietetic and Clinical Nutrition) (Tab 1) and Nestlé (Tab 2). 5000 Italians responded, and in this random sample overweight or obese women were only 34% with a higher percentage in the 19 -25 age group, compared to 57% of men. Women, however, seemed to show greater dissatisfaction with their physical appearance compared to men, and they tried to fix this problem by dieting with perseverance; by contrast men preferred physical exercise to control their body weight.

In addition to what was reported in the aforementioned study, women had high consumption of fruit and vegetables (more than twice a day) compared to men, and they preferred nourishing but light snacks (yogurt, crackers, cornflakes instead of filled sandwiches).

Data from international literature confirmed that a balanced diet is a hallmark of health. Both women and men need a correct calorific intake, by choosing a large variety of foods such as whole grains, fruit, vegetables low in saturated fats; dairy products and animal proteins. Regular physical exercise, adapted to age and general conditions, is also fundamental.

The model of the Mediterranean Diet represents one of the most balanced nutritional regimens, because it guarantees the assumption of all the essential micro and macro nutrients. It also makes a significant contribution to preventing chronic diseases, influencing the condition of cellular inflammation due to incorrect diet and increasing the life expectancy in good health.

Adherence to the Mediterranean diet is associated with a significant health improvement, linked to a significant reduction in mortality in general (9%), mortality for cardiovascular diseases (9%), for cancer (6%) and for neurological diseases (13%)[3].

	Men	Women
Overweight/obesity	57%	34%
Dissatisfaction towards weight	61%	69%
Diet	72%	87%
Sport	78%	58%
Fruit and vegetables assumption	47%	60%

Table 1 - Web survey ADI - Nestlé 2013

Nutrition in pregnancy

However, women have particular nutritional necessities, and these needs change in the different phases of their lives[4]. Adequate iron assumption is key for women's health, together with folic acid in particular during childbearing age and during pregnancy in order to reduce risks of congenital malformations in newborn babies. Under normal conditions, during pregnancy, blood levels of folic acid in the umbilical cord are 3 times higher than the concentrations in the mother's blood, because it is basic for the fetus's metabolic needs, such as amino acids, purine and phyrimidine metabolism. Folic acid levels become very low if the mother has a folate deficiency, which is why it is very important to supplement it.

Many studies demonstrate that folic acid supplementation in pregnancy reduces the risk of neural tube defects in newborn babies; however this association is weaker if the mother is overweight or obese. Wang in 2013 examined the existing links between folic acid supplementation, maternal BMI and risk of developing neural tube defects. This study included 459 pregnant women, in the period between 2006 and 2008. All of them were treated with folic acid supplement, and the researchers evaluated the prevalence of this disease in the offspring. Women were divided into 2 groups: one with subjects with BMI before pregnancy >24 (overweight or obese) and one with BMI <24: the statistical analysis showed that he incidence was higher in the group of overweight or obese women despite pharmacological supplementation[5].

Prevention of osteoporosis and cardiovascular diseases

In some phases of a woman's life it is important to control calcium intake because the need for it increases: during adolescence to form bone mass,

which reaches its peak at about the age of 30 and then it slowly falls; and during pregnancy and breastfeeding to prevent a negative balance, because of the increased need. In addition to this, many studies demonstrate that a higher calcium intake prevents gestosis. During menopause the need for calcium increases because the absorption physiologically decreases and the hormonal changes typical of this phase of life raise the risk of osteoporosis.

In these physiological situations, or worse in pathological conditions when there is a reduction in calcium absorption, the main organ of supply is the bone, with a consequent loss of bone mass in order to maintain normal calcium blood levels. The only way to introduce calcium is through the assumption of calcium-rich foods, calcium waters or pharmacological supplementation. An unbalanced diet influences the absorption of this mineral. A diet with a low intake of fat and greater consumption of fruit, vegetables and grains in menopausal women tends to reduce the risk of hip fractures.

A study called Women's Health Initiative Dietary Modification, conducted on 48,000 postmenopausal women aged between 50 and 79 years, evaluated the effect of a hypo lipid diet rich in fibre (at least 5 servings of fruit and vegetables and at least 6 servings of grains daily). Women were divided into two groups; one group which followed the above-mentioned dietetic therapy, and a control group who didn't receive any nutritional advice, and they evaluated the effects on incidence of hip fracture or fractures of other bones, on self-reported falls and on Bone Mineral Density (BMD). After 8 years of follow-up they demonstrated that a low-fat diet with increased fruit, vegetable, and grain consumption modestly reduced the risk of multiple falls and slightly lowered hip BMD but did not change the risk of osteoporotic fractures. Women who had menopausal hormone therapy had a lower risk of fractures [6].

Coronary heart disease (CHD) is the leading cause of death in women. A nested case-control study tested whether dietary patterns predicted CHD events among 1220 participants in the Women's Health Initiative-Observational Study (WHI-OS) with centrally confirmed CHD, fatal or nonfatal myocardial infarction compared to 1224 WHI-OS controls matched for age, enrolment date, race/ethnicity, and absence of CHD.

In this group there were three diet clusters: diet cluster 1 was rich in carbohydrates, vegetable protein, fibre, dietary vitamin K, folate, carotenoids, α-linolenic acid, linoleic acid, and supplemental calcium and vitamin D; diet cluster 2 was rich in total and animal protein, arachidonic acid, DHA, vitamin D, and calcium; and diet cluster 3 was rich in energy, total fat, and trans fatty acids.

The results demonstrated that diet cluster 1 was associated with a lower CHD risk than diet cluster 2 adjusted for smoking, education, and physical activity. Diet cluster 3 was associated with a higher CHD risk than diet cluster 2 and was the one with the greatest association with coronary disease[7].

Dietetic Guidelines for the prevention of Alzheimer's Disease

And after worrying about our heart, what do we have to do for our brain? The same foods which are healthy for our heart, can also bring benefits to our brain because they have a potential role in the prevention of neurological degenerative diseases, in particular of Alzheimer's Disease (AD).

The Dietetic Guidelines for the prevention of Alzheimer's Disease, drafted during the International Conference on Nutrition and the Brain, held in Washington in 2013, stated some basic points:

- Reduce consumption of saturated and trans fats, limiting dairy products, meat, palm and coconut oil. Avoid consumption of industrial sweets, cakes and fried food and check the nutrition label - in fact the trans fats content is indicated under "partially hydrogenated fats".
- Fruit, whole grains, vegetables and legumes must be consumed daily, they are the main protagonists of our diet.
- A small handful (about 30 g) of nuts, almonds, hazelnuts and other kinds of oil seeds daily represents a great source of vitamin E.
- Consume everyday foods and supplements containing Vitamin B12, in amounts sufficient to cover the everyday needs of an adult (2.4 mcg).
- In case it is necessary to take a multivitamin product, preferably choose formulations with low iron and copper content and take iron supplements only after medical prescription.
- The role of aluminium in the development of AD is still controversial, however it is better to avoid use of pots, antacid, yeasts or other products containing aluminium.
- Practise aerobic physical activity regularly (at least 40 minutes, 3 times a week)[8].

While a good diet helps to keep our brain young, it seems that healthy and balanced nutrition helps, in particular during menopause, to improve optimism and positivity in the fairer sex.

Optimism and diet quality

The Women's Health Initiative Observational Study investigated the relationship between opti-

mism and diet quality in postmenopausal women to determine whether optimism was associated with diet change after a 1-year dietary intervention. Diet quality was scored with the Alternate Healthy Eating Index (AHEI) and optimism assessed with the Life Orientation Test - Revised.

Women reporting high AHEI were non-Hispanic white, educated, physically active, past or never smokers, hormone therapy users, had lower body mass index and waist circumference, and were less likely to have chronic conditions. Higher optimism was associated with higher AHEI at baseline and with greater change over 1 year (P = 0.001). Effect modification by intervention status was observed, whereas control participants with highest optimism achieved a threefold greater AHEI increase compared with those with the lowest optimism. These data support a relationship between optimism and dietary quality score in postmenopausal women at baseline and over 1 year.

Nutritional status is related to health and appearance of skin, malnutrition in fact can lead to many skin diseases and nutritional supplementation instead can have beneficial effects on skin health and beauty.

Nutrition and skin health

The impact of malnutrition on skin health is also illustrated by skin changes (xerosis, hair effluvium, nail modifications) observed in anorexia nervosa; however even obesity can impair skin physiology: obese people exhibit significant increase in trans-epidermal water loss, suggesting an alteration of skin barrier function.

Furthermore, obesity may affect sebum production, contribute to micro and macro circulation changes, and modify collagen metabolism. Finally, obesity is associated with a number of dermatoses such as acanthosis nigricans, acrochordons and keratosis pilari.

Still controversial, the link between diet and acne has been recently highlighted by a study of male volunteers with acne showing a greater improvement in total lesion count in the low glycemic diet group compared to the control group.

Foods hypersensitivity seems to play a pathogenic role in the development of Atopic dermatitis (AD) lesions, and dietary exclusion of specific food or vegetarian diet has been reported to improve the disease. Diet has also been described to play a key role in the etiology and pathogenesis of psoriasis; a diet low in energy or at any rate poor in arachidonic acid could be an important adjuvant factor in its prevention and treatment.

Furthermore some evidence exists about the influence of a hyper lipid diet on the development of UV-induced skin lesions and on both basal and squamous cell carcinoma. Some antioxidant factors present in the Mediterranean diet might protect against skin melanoma.

In case of a particular disease there are specific nutritional interventions. Probiotics are described in some studies as having beneficial effects on the treatment and/or prevention of Atopic dermatitis, or docohexaenoic acid and fish oil supplementation in atopic eczema and psoriasis.

β-carotene (from 15 to 180 mg/day) and lycopene (up to 10 mg/day) have been used for nutritional supplementation in photo-immunosuppression and sunburns prevention[10].

It is well known from the international literature that a diet rich in carotenoids prevents cellular damage, premature skin aging and skin cancer.

Meinke in 2013 investigated whether orally administered carotenoids increase radical-scavenging activity and its effect on radical protection of the skin and the skin lipid profile (carotenoids and ceramide concentrations). A double-blind placebo controlled clinical study was performed with 24 healthy volunteers, who have shown a slow but significant and effective increase in cutaneous carotenoids in the verum group. The enhancement in carotenoids increases the radical scavenging activity of the skin and provides significant protection against stress-induced radical formation. Furthermore, the skin lipids in the verum group increased compared to the placebo group, but only significantly for ceramide. These results indicate that supplementation with dietary products containing carotenoids in physiological concentrations can protect the skin against reactive oxygen species and could prevent premature skin aging and other radical-associated skin diseases[11].

Conclusion

In general there are specific recommendations for women's nutrition which vary according to the different phases of life.

Between the ages of 20 and 30 it is essential to maintain an adequate calcium intake (1000 mg/day) in order to reach peak bone mass, choosing foods such as dairy products, milk, calcium-rich water and legumes.

Between the ages of 30 and 40 we suggest the consumption of foods rich in omega-3 and polyunsatured fatty acids so as to prevent cardiovascular disease, and in case of pregnancy it is necessary to start folic acid supplements.

Between the ages of 40 and 50 we recommend a diet rich in antioxidants and fibre against aging.

Between the ages of 50 and 60 years, reduce calorie intake to prevent weight gain, typical of meno-

pause, but increase vitamin D intake to prevent osteoporosis.

After the age of 60, maintain adequate consumption of protein foods to support muscle mass and food rich in vitamin B12 to make up for eventual deficiencies.

References

1. Elmadfa, I. European Nutrition and Health Report 2009. *Ann Nutr Metab*. 2009; 55(2): 1-5.
2. Atti del Convegno ADI al femminile dall'infanzia in poi. Fatati G. La donna del terzo millennio tra alimentazione, salute e stili di vita. Aprile 2010.
3. Sofi F, Cesari F, Abbate R, Gensini GF, Casini A. Adherence to Mediterranean diet and health status: meta-analysis. *BMJ*. 2008; 337:a1344.
4. Kaiser LL, Campbell CG; Academy Positions Committee Workgroup. Practice paper of the Academy of Nutrition and Dietetics abstract: nutrition and lifestyle for a healthy pregnancy outcome. Academy Positions Committee Workgroup. *J Acad Nutr Diet*. 2014; 114(9):1447.
5. Wang M, Wang ZP, Gao LJ, Gong R, Sun XH, Zhao ZT. Maternal body mass index and the association between folic acid supplements and neural tube defects. *Acta Paediatr*. 2013; 102(9):908-13.
6. McTiernam A, Wactawski-Wende J, Wu L, et al.; Women's Health Initiative Investigators. Low-fat, increased fruit, vegetable, and grain dietary pattern, fractures, and bone mineral density: the Women's Health Initiative Dietary Modification Trial. *Am J Clin Nutr*. 2009; 89(6):1864-76.
7. Horn LV, Tian L, Neuhouser ML, et al. Dietary patterns are associated with disease risk among participants in the Women's Health Initiative Observational Study. *J Nutr*. 2012; 142(2):284-91.
8. Linee Guida Dietetiche per la prevenzione della demenza di Alzheimer Traduzione a cura della dottoressa Luciana Baroni, medico neurologo, geriatra e nutrizionista. (a cura di) Physicians Committee for Responsible Medicine - PCRM (Comitato dei Medici per una Medicina Responsabile).
9. Hingle MD, Wertheim BC, Tindle HA, et al. Optimism and diet quality in the Women's Health Initiative. *J Acad Nutr Diet*. 2014; 114(7):1036-45.
10. Piccardi N, Manissier P. Nutrition and nutritional supplementation: Impact on skin health and beauty. *Dermatoendocrinol*. 2009; 1(5): 271–274.
11. Meinke MC, Friedrich A, Tscherch K, et al. Influence of dietary carotenoids on radical scavenging capacity of the skin and skin lipids. *Eur J Pharm Biopharm*. 2013; 84(2):365-73.

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Endolaser soft lift: from theory to practice

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ABSTRACT

Patients' desire for beauty and their fear of undergoing surgery is something to deal with for all the specialists who work in this field. For this reason lasers, nowadays, seem to represent the future of cosmetic surgery in body contouring. Photothermal action on subdermal tissues, due to its effect on skin tightening and retraction, allows similar outcomes compared to classic procedures (e.g. thread lift), with greater comfort for the patient, less pain and fewer scars, fewer complications and shorter recovery time. In this study we used a 1470 nm diode laser, which is a nonablative laser that goes deep into the tissues due to its high affinity for fat and water.

Keywords
Endolaser, laserlift, diode laser

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Introduction

Despite the widespread use of cosmetic surgery and the increasing demand for lifting and body remodeling procedures, nowadays a considerable number of people are afraid to undergo classic surgery. For this reason new methods, less invasive and less traumatic, have been studied and proposed; in this regard, very encouraging results have been obtained with the use of lasers which seems to represent the future of cosmetic surgery in body contouring. Endolaser soft lift gives a photothermal injury on subdermal tissues; due to its effect on skin tightening and retraction, this new procedure allows similar outcomes compared to classic thread lift, with greater comfort for the patient, less pain and fewer scars, fewer complications and shorter recovery time. To perform this procedure we use a 1470 nm diode laser, which is a nonablative laser able to penetrate deeply into tissues due to its high affinity for fat and water.

Materials and Methods

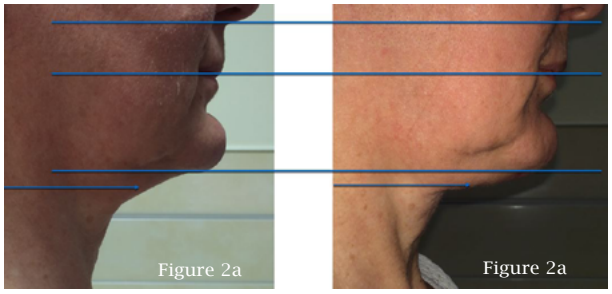
In our study Endolift procedures were performed with a Diode laser, emitting at 1470 nm (Eufoton Lasemar 1500, Via Flavia 23/1, 34148 Trieste, Italy). The light is delivered to the skin by an optic fibre of 100, 200, 300, 400, 600 and 1000 nm. The laser is equipped with a fractional scanner which can be used with both 200 and 400 micron power cables. Using a cannula, inserted trough a tab incision into the skin, reaching the junction between the deep dermis and superficial layer of subdermic fat, the surgeon can obtain several vectors of traction. A key point in this procedure is the right position of the cannula during the procedure. We checked it by ultrasonographic examination while performing the treatment, and 3 weeks later the same examination was performed to demonstrate the fibrosis obtained by laser and cannula[1]. The tightening continues, according to the wound healing process, for the next three months approximately, with better results month after month.

To obtain the right photothermal injury the cannula should go forward and backward 3 times in each tunnel, emitting laser light while moving back. The tunnels must be oriented according to antigravitational lines and their numbers could vary from a minimum of 3 to a maximum of 10 depending on the treated area. In small areas (periumbilical area or the medial aspect of thigh and knees) or were the skin is very thin (cheek and neck), the endolaser softlift can be performed using a free fibre. To obtain the best result the procedure must be repeated three times at 4 or 5 month intervals. (Figg. 1-2)

The treatment can be performed under local anesthesia; there is no pain after treatment despite a burning sensation for at least 4-5 hours, which can be controlled by oral painkillers. The patient will have a compressive dressing to keep in place 24 hours a day for the first 4 days post-op, and only during the night for 4 more days. Edema and ecchymosis can occur in treated areas; both will resolve spontaneously. Antibiotic therapy is suggested. Results are visible three or four months after the last treatment, but to reach the best result we need to wait at least 8 months, due to the time that subcutaneous scars need to reshape the treated area.

Results

Good results and great patient satisfaction were obtained at 6 months follow-up. Naturally endolift is not a substitute for a major surgical procedure like traditional lifting, but it is a good solution for those patients who refuse traditional surgery.



Figures 1a-2a - pre-operative picture, submental region
Figures 1b-2b - 6 months follow up after 2 pass endolift, fibre 400 micron 4 W pm

Discussion

Out of the many different kinds of lifting described in the literature (subcutaneous face lift, deep subcutaneous lift, subcutaneous face lift with suture, manipulation of superficial fat and SMAS, subcutaneous face lift with SMASectomy, the Skoog procedure, subperiosteal approach and so on[2]), thread lift surely represents a less invasive approach that consists

of lifting sagging skin using surgical sutures, with small skin incisions[2,3,4]. Side effects and complications in this procedure are ecchymosis, erythema, hematoma, swelling, discomfort, thread exposure and asymmetries[4]. The outcomes with an endolaser soft lift procedure using a diode laser are comparable in cosmetic outcomes to a standard thread lift (mini lifting) but imply considerable minor risk and discomfort for the patient[4,5,6,7,8]. The combination of the mechanical action of the cannula used to obtain several tunnels through the subdermal tissues[3] and the controlled photothermal injury obtained with the laser which gives us skin tightening, retraction and then lifting[4] is the key point of this procedure. The 1470 nm wavelength interacts mostly with fat and water; the richer a tissue is in water and fat, the better will be the laser transmission, and the lower its dispersion. Moreover laser action preserves vessels' interstice; this result in less ecchymosis and hematoma in comparison with surgical procedures. Within the subdermal adipose tissue, photothermal injury induces an increase in collagen production resulting in greater skin elasticity and tightening. The amount of thick septae in the superficial fat layer seems to predict the degree of skin retraction[4]. The best indication for this technique is a medium degree of skin excess in the same areas that could be treated with a standard thread lift (face and neck, arms, abdomen and legs). To obtain the best results in skin tightening we can also combine endo-laser soft lift with fractional non-ablative skin rejuvenation. Results are visible three or four months after the last treatment, reaching a peak in the next six months[5].

Conclusion

After this study we believe that with endo-laser soft lift we can achieve similar cosmetic outcomes compared to classic thread lift with minor discomfort, pain and scarring. However, more studies must be done, to be sure that this technique is really safe and effective.

References

1. Scrimali L, Lomeo G, Dell'Avanzato R, Crippa A. Endolaser soft-lift: a new approach on body contouring. Perspective and suggestions. *Eur. J. Aesth. Medicine and Dermatology*. 2013; 3(3):86-90.
2. Warren RJ, Aston SJ, Mendelson BC. Face Lift. *Plast Reconstr Surg*. 2011; 128(6):747e-64e.
3. Winkler E, Goldan O, Regev E, Mendes D, Orenstein A, Haik J. Stensen duct rupture (sialocele) and the complications of the Aptos thread technique. *Plast Reconstr Surg*. 2006; 118(6):1468-71.
4. Rasko YM, Beale E, Rohrich RJ. Secondary rhytidectomy: comprehensive review and current concepts. *Plast Reconstr Surg*. 2012; 130(6):1370-8.
5. Hamra ST. Composite rhytidectomy. *Plast Reconstr Surg*. 1992; 90(1):1-13.
6. Owsley JQ Jr. Platysma-fascial rhytidectomy: a preliminary report. *Plast Reconstr Surg*. 1977; 60(6):843-50.
7. Aston SJ. Platysma-SMAS cervicofacial rhytidoplasty. *Clin Plast Surg*. 1983; 10:507-520.
8. Marten TJ. High SMAS facelift: combined single flap lifting of the jawline, cheek, and midface. *Clin Plast Surg*. 2008; 35(4):569-603.

Courses and Congresses

2015

19-21 February - Malaga (Spain)
30th Spanish Congress of Aesthetic Medicine
Spanish Society of Aesthetic Medicine
Ronda General Mitre, 210, 08006 Barcelona (Spain)
President: Petra Vega
Web:
E-mail: secretaria@seme.org

14 March – Bucharest (Romania)
Course: Treatment of Vascular Lesions Romanian Society for Aesthetic Medicine and Dermatologic Surgery
Venue: Hotel Novotel
Calea Victoriei 37B - Sector 1
010061 BUCHAREST, ROMANIA
Organizer: Dr. Mihaela Leventer
mihaelaleventer@drleventercentre.com
www.drleventercentre.com

3-5 April – Marrakech (Morocco)
International Congress of Dermastic Moroccan Association of Surgical Dermatology – Cosmetic Aesthetic Medicine – Anti-Aging Medicine
Venue: Le Meridien Nfis
President: Ahmed Bourra
www.dermastic.asso.ma
dermastic.asso@hotmail.com

24-25 April – Brussels (Belgium)
25th Congress of the Belgian Society of Aesthetic Medicine
Venue: Radisson Blu Royal Hotel
Rue Fossé aux Loups, 47 – Brussel
Organisation
Jean Hebrant – Hugues Cartier
www.sbme-bveg.be
info@aesthetic-medicine.be

15-16-17 May – Rome (Italy)
36th National Congress of the Italian Society of Aesthetic Medicine
10th National Congress of the Italian Academy of Aesthetic Medicine
Venue: Congress Centre Rome Cavalieri
President of the Congress: Emanuele Bartoletti
sime@lamedicinaestetica.it
congresso@lamedicinaestetica.it
www.lamedicinaestetica.it

28-29 May – Odessa (Ukraine)
International conference
"Important issues of current plastic surgery, aesthetic medicine and dermatology"
Ukrainian Society of Aesthetic Medicine
President: Vladimir Tsepkolenko
office@virtus.ua

29-30 May – Pretoria (South Africa)
The 9th Aesthetic Medicine Congress of South Africa
Aesthetic & Anti-aging Medicine Society of South Africa
Venue: CSIR Convention Centre
President of the Congress: Riekie Smit
info@aesthmed.co.za
www.aesthmed.co.za

27-28 June – Tbilisi (Georgia)
III International Congress of Aesthetic Medicine
Georgian Society of Aesthetic Medicine
Venue: "Expo Georgia" Event Hall # 3
Co-organiser: Scientific-Professional Society of Dermatovenereologists of Georgia
Department of Dermatovenereology of TSMU
Tel. +995 (32) 2 250565 - +995 5 5 77545108
E-mail: info@gsoam.ge
www.gsoam.ge

16-17 July – Montevideo (Uruguay)
Congress of the Uruguayan Aesthetics Medical Society
President: Alberto Elbaum
www.sume.com.u

3- 14 August - Buenos Aires (Argentina)
Degree course in Aesthetic and Anti-Aging Medicine
Practical module
Argentinian Society of Aesthetic Medicine
SOARME
Director: Prof. Dr. Raúl Pinto

info@soarme.com
www.soarme.com

22-23 September – Odessa (Ukraine)
Seminar and master class
"Regenerative technologies in Aesthetic Medicine"
Ukrainian Society of Aesthetic Medicine
President: Vladimir Tsepkolenko
office@virtus.ua

25-26 September – Paris (France)
36th National Congress of Aesthetic Medicine and Dermatologic Surgery
French Society of Aesthetic Medicine
French Association of Morpho-Aesthetic and Anti-Aging Medicine
National Institute of education in aging prevention
Venue: Palais de Congres
www.sfme.info
congress@sfme.info

1-3 October – Quito (Ecuador)
VII Ecuadorian Congress of Aesthetic Medicine
Ecuadorian Society of Aesthetic Medicine
Venue: Swissotel Quito
President of the Congress: Dra Viveka Tinoco Kirby
seem2008cg@gmail.com
www.seem.com.ec

2-4 October – Warsaw (Poland)
XV International Congress of Aesthetic and Anti-Aging Medicine
X International Conference - Laser and other sources of energy in Aesthetic Medicine
Hilton Warsaw Poland
www.ptmeiaa.pl
sekretariat@ptmeiaa.pl

7 November – Lausanne (Switzerland)
XIV Congress of the Swiss Society of Aesthetic Medicine
Venue: Beau-Rivage Palace
President: Xavier Martin
www.ssme.ch
xmartin@worldcom.ch

6-7 November – Toronto (Ontario – Canada)
CAAM 12th Annual Conference
Canadian Association of Aesthetic Medicine
Venue: The Westin Prince Hotel
CAAM Office Executive Director:
Susan Roberts
s.roberts@caam.ca
www.caam.ca

12-15 November – Miami (Florida – USA)
20th World Congress of Aesthetic Medicine
"Discoveries in Aesthetic Medicine"
American Academy of Aesthetic Medicine
Union Internationale de Médicine Esthétique
Venue: JW Marriott Miami
President: Michel Delune
www.aaamed.org/20wcam
wcam@aaamed.org

14 November – Madrid (Spain)
VI Monographic days of SEME
Spanish Society of Aesthetic Medicine
www.seme.org

26-27 November – Algiers (Algeria)
14th National Congress of Aesthetic Medicine and Surgery
Algerian Society of Aesthetic Medicine
Venue: Hotel Hilton
President: Mohamed Oughanem
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www.same-dz.com

2016

January – Caracas (Venezuela)
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Degree Course in Facial Aesthetic
18 hours of University Credits
Degree Course in Metabolism, Nutrition and integral management of obesity
10 hours of University Credits
www.fuceme.org
fuceme@gmail.com
tel 00 58 416 6219974

18-20 February – Malaga (Spain)
31st National Congress of Aesthetic Medicine
Spanish Society of Aesthetic Medicine
Ronda General Mitre, 210, 08006 Barcelona (Spain)
President: Petra Vega
Web: www.seme.org

E-mail: secretaria@seme.org

4-5 March – Mexico City (Mexico)
XI Pan American Congress of Aesthetic Medicine
XIII Mexican Congress of Aesthetic and Anti-Aging Medicine
XIII Venezuelan Congress of Aesthetic Medicine
Mexican Scientific Society of Aesthetic Medicine
Aesthetic Medicine Society of Venezuela
Presidents: Blanca Miller Kobisher – Victor Garcia Guevara
25-27 March - Casablanca (Morocco)
International Congress of Dermastic
Moroccan Association of Surgical Dermatology – Cosmetic Aesthetic Medicine – Anti-Aging Medicine
President: Ahmed Bourra
www.dermastic.asso.ma
dermastic.asso@hotmail.com

31 March - 2 April - Buenos Aires (Argentina)
26th Argentinian Congress of Aesthetic Medicine
Argentinian Society of Aesthetic Medicine
SOARME
Presidente: Prof. Dr. Raúl Pinto
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www.soarme.com

13-15 May – Rome (Italy)
11th European Congress of Aesthetic Medicine
37th National Congress of the Italian Society of Aesthetic Medicine
11th National Congress of the Italian Academy of Aesthetic Medicine
Venue: Congress Centre Rome Cavalieri
President of the Congress: Emanuele Bartoletti
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www.lamedicinaestetica.it

16-17 September – Paris (France)
37th National Congress of Aesthetic Medicine and Dermatologic Surgery
French Society of Aesthetic Medicine
French Association of Morpho-Aesthetic and Anti-Aging Medicine
National Institute of education in aging prevention
Venue: Palais de Congres
www.sfme.info
congress@sfme.info

2017

November - Istanbul (Turkey)
21st World Congress of Aesthetic Medicine
Turkish Society of Aesthetic Medicine
President: Hasan Subasi
Rumeli Caddesi Durak Apt N° 2, D.7
Nisantasi, Istanbul - Turkey
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