

Aesthetic Medicine / Volume 4 / N° 1 / January/March 2018



# aesthetic medicine

Official Journal of the  
International Union of Aesthetic Medicine UIME



## Official UIME English Language Journal of:

Aesthetic and Anti-Aging Medicine Society of South Africa  
 Aesthetics Medical Society of Uruguay  
 Aesthetic Medicine Society of Venezuela  
 Algerian Society of Aesthetic Medicine  
 American Academy of Aesthetic Medicine  
 Argentine Society of Aesthetic Medicine  
 Belgian Society of Aesthetic Medicine  
 Canadian Association of Aesthetic Medicine  
 Colombian Association of Aesthetic Medicine  
 Croatian Association of Aesthetic Medicine  
 Ecuadorian Society of Aesthetic Medicine  
 French Society of Aesthetic Medicine  
 Georgian Society of Aesthetic Medicine  
 Italian Society of Aesthetic Medicine  
 Kazakhstan Association of Aesthetic Medicine and Plastic Surgery  
 Korean Academy of Aesthetic Medicine  
 Mexican Scientific Society of Aesthetic Medicine  
 Moroccan Society of Aesthetic Medicine  
 Polish Society of Aesthetic and Anti-Aging Medicine of Polish Medical Society  
 Society of Aesthetic Medicine in Turkey  
 Spanish Society of Aesthetic Medicine  
 Swiss Society of Aesthetic Medicine  
 Ukrainian Society of Aesthetic Medicine

[www.aestheticmedicinejournal.org](http://www.aestheticmedicinejournal.org)



# aesthetic medicine

Official Journal of the  
International Union of Aesthetic Medicine UIIME

## Editor-in-chief

Francesco Romanelli  
Rome, Italy

## Editors

Emanuele Bartoletti, Italy  
Alfonso Carvajal Gomez, Colombia  
Annarosa Catizzone, Italy  
Loredana Cavalieri, Italy  
Nadia Fraone, Italy  
Fernando García Manforte, Spain  
Mohamed Oughanem, Algeria  
Raul Pinto, Argentina  
Sandra Ramirez Naranjo, Colombia  
Ferdinando Terranova, Italy  
Dorota Wydro, Poland  
Jan-Bong Yun, Korea

## Executive Editors

Emanuele Bartoletti, Italy  
Annarosa Catizzone, Italy  
Loredana Cavalieri, Italy  
Nadia Fraone, Italy  
Giovanni Messina, Italy  
Hernán Pinto, Spain  
Raffaele Rauso, Italy  
Ferdinando Terranova, Italy

## Managing Editor

Emanuele Bartoletti, Italy

## Main Handling Editor

Hernán Pinto, Spain

## Associate Editors

Patricia Frisari, Argentina - Tulegenova Gulnur, Kazakhstan - Andrzej Ignaciuk, Poland - John Kim, California (USA) - Alexander Kutubidze, Georgia - Omnia Latif, New Jersey (USA) - Leonor Lemmo, Venezuela - Mihaela Leventer, Romania - Alp Mamak, Turkey - Xavier Martin, Swiss - Gilda Marzullo, Chile - David Melamed, California (USA) - Farid-Salim Oughanem, Algeria - Olga Panova, Russia - Susan Roberts, Canada - Pilar Rodrigo Anoro, Spain - Ismael Terzano, Uruguay - Viveka Tinoco Kirby, Ecuador - Sonia Lamari, Algeria.

## Statistical Editor

Patrizio Pasqualetti, Italy

## Editorial Board

Gladys Arroyave Estrada, Colombia - Ahmed Bourra, Morocco - Elma Bunar, Croatia - José Cabo Soler, Spain - Alfonso Carvajal Gómez, Colombia - Andrés Eliú Castell Rodríguez, Mexico - Eduardo Civila, Uruguay - Michel Delune, California (USA) - Fernando Echeverria, Chile - Alberto Elbaum, Uruguay - Victor Garcia-Guevara, Venezuela - Jean Hebrant, Belgium - Andreij Ignaciuk, Poland - Alexander Katsitadze, Georgia - Serge Lê Huu, Switzerland - Jean-Jacques Legrand, France - Mihaela Leventer, Romania - Hongcheng Liu, China - Xavier Martin, Switzerland - Joao Pedro Macedo Vale, Portugal - Gilda Marzullo, Chile - Alena Mayorova, Russia - Irina Medvedeva, Ukraine - Blanca Miller Kobisher, Mexico - Mohamed Oughanem, Algeria - Olga Panova, Russia - Iván Pinto, Venezuela - Raul Pinto, Argentina - Catalin Mihai Popescu, Romania - Aicha Salhi, Algeria - Rikie Smit, South Africa - Hasan Subasi, Turkey - Vladimir Tsepko-lenko, Ukraine - Viveka Tinoco Kirby, Ecuador - Ekaterina Ugrehelidze, Georgia - Renier Van Aardt, Canada - Pedra Vega, Spain - Jerzy Woy-Wojciechowski, Poland - J. Yun, Korea - Gulnar Zhumatova, Kazakhstan.

*Aesthetic Medicine* (registered by the Court of Rome on 28/4/2015 under the number 63/2015) is published 4 times a year (March, June, September, December) by Salus Internazionale ECM Srl, via Monte Zebio, 28 - 00195 Roma, tel. +39 06 36003462 - fax +39 06 37519315,

E-mail: [salus@editricesalus.it](mailto:salus@editricesalus.it); [www.lamedicinaestetica.it](http://www.lamedicinaestetica.it).

**Subscription Information:** All subscriptions inquiries, orders, back issues, claims, and renewals should be addressed to Salus Internazionale ECM Srl. Free subscription (Four issues: March, June, September, December).

**Copyright Permission:** Permission requests to photocopy or otherwise reproduce material published in this journal should be submitted by sending and e-mail to [aemj@aestheticmedicinejournal.org](mailto:aemj@aestheticmedicinejournal.org).

**Advertising:** Current advertising rates and specifications may be obtained by sending and e-mail to [aemj@aestheticmedicinejournal.org](mailto:aemj@aestheticmedicinejournal.org). EPub [15/01/2018]



aesthetic medicine

Official Journal of the  
International Union of Aesthetic Medicine UIME

## Editorial

Francesco Romanelli

X

## Contents

Review

### Effects of an isocaloric low glycemic load diet in polycystic ovary syndrome: an update

Annalisa Panico, Roberto Marcantonio, Gelsy Arianna Lupoli, Giovanni Messina, Giovanni Lupoli

pag 14

Review

### Agarose gel – high patient satisfaction of a full-facial volume augmentation

Arna Shab, Catharina Shab

pag 21

Original Article

### Hyperdiluted PLLA for inner arm skin tightening. Personal experience

Emanuele Bartoletti, Loredana Cavalieri

pag 26

Original Article

### Palpebral Skin Bio-Restructuring

Luca Piovano, Alberto Liberti, Valentina Sorvillo

pag 33

Original Article

### The anatomical and physical principles, and proper strategy for implanting polylactic acid suspension wires into various parts of the body

Bruno Bovani, Saverio Bovani, Walter Bugiantella

pag 38

Narrative review

### Sexuality and beauty: intimate relations

Nicoletta Garisto, Annarosa Catizzone

pag 44

Courses and Congresses

pag 50

# Guidelines for Authors

Aesthetic Medicine is a multidisciplinary Journal with the aim of informing readers about the most important developments in the field of Aesthetic Medicine.

## Submission of manuscripts

All articles in their final version - completed with name, surname, affiliation, address, phone number and e-mail address of the author (s) - must be sent in word format to the Editorial Committee at the following e-mail address:

[aemj@aestheticmedicinejournal.org](mailto:aemj@aestheticmedicinejournal.org). Manuscripts must be written in English, and authors are urged to aim for clarity, brevity, and accuracy of information and language. All manuscripts must include a structured abstract. Authors whose first language is not English should have their manuscripts checked for grammar and stylistic accuracy by a native English speaker.

## Manuscript specifications

### Title page

The title page should include:

- The name(s) of the author(s)
- A concise and informative title
- The affiliation(s) and address(es) of the author(s)
- The e-mail address, telephone and fax numbers of the corresponding author
- Include a short title (not to exceed 30 characters in length, including spaces between words) for use as a running head
- The authors must disclose any commercial interest that they may have in the subject of study and the source of any financial or material support

### Abstract

The length of the abstract should be no more than 250 words and should include the following headings: Background, Aim, Methods, Results, Conclusions

### Keywords

Up to six keywords should be listed and separated by a comma (please, verify keywords on MeSH).

## Manuscript categories

- Original article
- The manuscript should be organised in the following sections:
  - Structured Abstract. The length of the abstract should be no more than 250 words and should include the following headings: Background, Aim, Methods, Results, Conclusions
  - Introduction
  - Materials and Methods
  - Results
  - Discussion and Conclusions
  - Acknowledgments
  - Conflict of interest
  - Reference list
  - Legends (max 10)

The manuscript must not exceed 4000 words and 50 references.

### Review

This type of article uses Unstructured Abstract. It must not exceed 4000 words and includes figures and tables (max 15), legends, and up to 200 references.

### Mini-review

This type of article uses Unstructured Abstract. It must not exceed 2000 words and includes figures and tables (max 12), legends, and up to 100 references.

### Case Report

This type of article uses Unstructured Abstract. It must not exceed 1500 words and includes figures and tables (max 6), legends, and up to 30 references.

### Style

- Use a normal, plain font (e.g., 12-point Times Roman) for text
- Double-space the text
- Use italics for emphasis
- Use the automatic page numbering function to number the pages
- Do not use field functions
- Use tab stops or other commands for indents, not the space bar
- Use the table function, not spreadsheets, to make tables

## Acknowledgments

The authors declare that they have no conflict of interest.

If potential conflicts of interest do exist, the authors should provide details (see below) for each affected author in a note in a separate DISCLOSURE section of the manuscript document text, before the list of references.

## Conflict of interest disclosure

Conflicts of Interest need to be explicitly defined before any manuscript can be considered for publication.

## References

References must be cited consecutively in the text as superscript numerals and listed on a separate sheet in numerical order at the end of the text. The references must be cited according to the AMERICAN MEDICAL ASSOCIATION (AMA) CITATION STYLE.

For this reason, they must contain author's surname and name initial, the original title of the article, the title of the journal (abbreviated and in italic), the year of publication, the number of the volume, the number of the first and last page.

# AMERICAN MEDICAL ASSOCIATION (AMA) CITATION STYLE

Rev. 11/1/2012

## General rules from the 10th edition

- Items are listed numerically in the order they are cited in the text
- Include up to 6 authors
- For more than six, provide the names of the first three authors and then add et al
- If there is no author, start with the title
- Periodicals (journals, magazines, and newspapers) should have abbreviated titles; to check for the proper abbreviation, search for the Journal Title through [LocatorPlus](#) at the National Library of Medicine website

Citation Type	Example
<b>Journal article - in print - one author</b>	Spencer J. Physician, heal thyself - but not on your own please. <i>Med Educ.</i> 2005; 89: 548-549.
<b>Journal article - in print - 2-6 authors</b>	<b>Salwachter AR, Freischlag JA, Sawyer RG, Sanfey HA.</b> The training needs and priorities of male and female surgeons and their trainees. <i>J Am Coll Surg.</i> 2005; 201: 199-205.
<b>Journal article - in print - more than 6 authors</b>	<b>Fukushima H, Cureoglu S, Schachern P, et al.</b> Cochlear changes in patients with type 1 diabetes mellitus. <i>Otolaryngol Head Neck Surg.</i> 2005; 133: 100-6.
<b>Journal article - online*</b> *if there is no DOI, provide the URL for the specific article	Coppinger T, Jeanes YM, Hardwick J, Reeves S. Body mass, frequency of eating and breakfast consumption in 9-13- year-olds. <i>J Hum Nutr Diet.</i> 2012; 25(1): 43-49. doi: 10.1111/j.1365-277X.2011.01184.x
<b>Journal article - online from a library database*</b> *there is no specific way to cite articles found in library databases according to the AMA so double check with your professor	Calhoun D, Trimarco T, Meek R, Locasto D. Distinguishing diabetes: Differentiate between type 1 & type 2 DM. <i>JEMS [serial online]</i> . November 2011; 36(11):32-48. Available from: CINAHL Plus with Full Text, Ipswich, MA. Accessed February 2, 2012.
<b>Newspaper article - in print*</b> *if the city name is not part of the newspaper name, it may be added to the official name for clarity * if an article jumps from one page to a later page write the page numbers like D1, D5	Wolf W. State's mail-order drug plan launched. <i>Minneapolis Star Tribune.</i> May 14, 2004:1B.
<b>Newspaper article - online</b>	Pollack A. FDA approves new cystic fibrosis drug. <i>New York Times.</i> January 31, 2012. <a href="http://www.nytimes.com/2012/02/01/business/fda-approves-cystic-fibrosis-drug.html?ref=health">http://www.nytimes.com/2012/02/01/business/fda-approves-cystic-fibrosis-drug.html?ref=health</a> Accessed February 1, 2012.
<b>Websites</b>	Outbreak notice: Cholera in Haiti. Centers for Disease Control and Prevention Web site. <a href="https://www.cdc.gov">https://www.cdc.gov</a> Published October 22, 2010. Updated January 9, 2012. Accessed February 1, 2012.
<b>Entire book - in print</b>	Modlin J, Jenkins P. <i>Decision Analysis in Planning for a Polio Outbreak in the United States.</i> San Francisco, CA: Pediatric Academic Societies; 2004.
<b>Book chapter - in print</b>	Solensky R. Drug allergy: desensitization and treatment of reactions to antibiotics and aspirin. In: Lockey P, ed. <i>Allergens and Allergen Immunotherapy.</i> 3 <sup>rd</sup> ed. New York, NY: Marcel Dekker; 2004:585-606.

To find more AMA style citations, go checkout the [AMA Manual of Style: A Guide for Authors and Editors.](#) 10th ed. Oxford: Oxford UP.

# AMERICAN MEDICAL ASSOCIATION (AMA) CITATION STYLE

Rev. 11/1/2012

## Citing sources within your paper

Unlike APA or MLA, you will not use the author's last name for the in-text citations. Instead, you will number each instance when you are referencing an article. The order of numbering will be contingent on the order in which you use that reference within your paper. In the example below, the first article referenced is given the number one in superscript. In the References section, you will find the matching article listed as number 1.

<b>Example Article</b>  1. Zoellner J, Krzeski E, Harden S, Cook E, Allen K, Estabrooks PA. Qualitative application of the theory of planned behavior to understand beverage consumption behaviors among adults. <i>J Acad Nutr Diet.</i> 2012;112(11):1774-1784. doi: 10.1016/j.jand.2012.06.368.	
<b>In-Text Citation Example</b>	<p><b>L</b>ARGE 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<sup>1</sup>. It is estimated that SSB<sup>2,3</sup> account for about 10% of total energy intake in adults. High intake of SSB has....</p>
<b>References Section Example</b>	<p><b>References</b></p> <ol style="list-style-type: none"><li>1. Duffey KJ, Popkin BM. Shifts in patterns and consumptions of beverages between 1965 and 2002. <i>Obesity.</i> 2007;15(11):2739-2747.</li><li>2. Nielsen SJ, Popkin BM. Changes in beverage intake between 1977 and 2001. <i>Am J Prev Med.</i> 2004;27(3):205-210.</li><li>3. Drewnowski A, Bellisle F. Liquid calories, sugar, and body weight. <i>Am J Clin Nutr.</i> 2007;85(3):651-661.</li></ol>

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).<sup>1</sup> 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

Citing AMA guide website <http://libguides.stkate.edu/c.php?g=101857&p>. Updated April 2011. Accessed October 24, 2012.

To find more AMA style citations, go checkout the [AMA Manual of Style: A Guide for Authors and Editors](#). 10th ed. Oxford: Oxford UP.

### **Images and Tables**

All images within the word file must be numbered progressively and accompanied by the corresponding captions, with precise references in the text. Moreover, the images should be sent separately and in HD (at least 300 Dpi, in TIFF or JPEG format).

Graphs and charts are progressively numbered and accompanied by the corresponding captions, with precise references in the text. They must be sent separately, preferably in Excel format.

It is necessary to give the authorization to reproduce already published materials or to use people portraits, in case they are recognizable. The Authors has full, exclusive and personal responsibility and respect for the rules protecting privacy, originality and content (text, images) of the articles.

### **Artwork instructions**

#### **Permission**

Photographs in which a person is identifiable must either have the face masked out, or be accompanied by written permission for publication from the individual in the photograph. Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and the online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors. Please be informed that we will not be able to refund any costs that may have occurred in order to receive these permissions from other publishers. Please be aware that some publishers do not grant electronic rights for free (an example is Thieme Publishers). In these cases we kindly ask you to use figures from other sources.

**Editorial Office**

# **Salus**

## **Internazionale ECM**

Via Monte Zebio, 28 - 00195 Roma  
Tel. + 39 06 37353333 - Fax +39 06 37519315  
[www.aestheticmedicinejournal.org](http://www.aestheticmedicinejournal.org)

Submit your manuscripts at  
[aemj@aestheticmedicinejournal.org](mailto:aemj@aestheticmedicinejournal.org)

# Publication Ethics and Publication Malpractice Statement

Aesthetic Medicine undertakes to defend the rules of ethical behavior in every stage of the process by adopting and promoting the standards set by Code of Conduct and Best Practice Guidelines for Journal Editors.

## Duties of Editors

### Publication decisions

The editor of a peer-reviewed journal is responsible for deciding which of the articles submitted to the journal should be published. The editor will evaluate manuscripts without regard to the authors' race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy. The editor may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism.

### Confidentiality

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers or the publisher, as appropriate.

### Disclosure and conflicts of interest

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the express written consent of the author. Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. When the editorial board is notified or discovers a significant problem regarding errors/ inaccuracy, undisclosed conflict of interest, plagiarism, in a published article, the editorial board will promptly notify the corresponding author and the publisher and will undertake the necessary actions to clarify the issue and in case of need to retract the paper or publish an Erratum, following the COPE Guidelines.

### Involvement and cooperation in investigations

An editor should take reasonably responsive measures when ethical complaints have been presented concerning a submitted manuscript or published paper, in conjunction with the publisher (or society). Such measures will generally include contacting the author of the manuscript or paper and giving due consideration of the respective complaint or claims made, but may also include further communications to the relevant institutions and research bodies, and if the complaint is upheld, the publication of a correction, retraction, expression of concern, or other note, as may be relevant. Every reported act of unethical publishing behaviour must be looked into, even if it is discovered years after publication.

## Duties of Reviewers

### Contribution to editorial decisions

Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper. Peer review is an essential component of formal scholarly communication, and lies at the heart of the scientific endeavour. Aesthetic Medicine shares the view of many that all scholars who wish to contribute to publications have an obligation to do a fair share of reviewing.

### Promptness

Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse him/herself from the review process.

### Confidentiality

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorised by the editor.

### Standards of objectivity

Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

### Acknowledgement of sources

Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

### Disclosure and conflict of interest

Unpublished materials disclosed in a submitted manuscript must not be used in a reviewer's own research without the express written consent of the author. Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies or institutions connected to the papers.

## Duties of Authors

### Reporting standards

Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behaviour and are unacceptable. Review and professional publication articles should also be accurate and objective, and editorial 'opinion' works should be clearly identified as such.

### Data access and retention

Authors may be asked to provide the raw data in connection with a paper for editorial review, and should in any event be prepared to retain such data for a reasonable time after publication.



### **Originality and plagiarism**

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others, that these have been appropriately cited or quoted. Plagiarism takes many forms, from “passing off” another’s paper as the author’s own paper, to copying or paraphrasing substantial parts of another’s paper (without attribution), to claiming results from research conducted by others. Plagiarism in all its forms constitutes unethical publishing behaviour and is unacceptable.

### **Multiple, redundant or concurrent publication**

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behaviour and is unacceptable. In general, an author should not submit a previously published paper for consideration in another journal.

### **Acknowledgement of sources**

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work. Information obtained privately, for example in conversation, correspondence, or discussion with third parties, must not be used or reported without explicit, written permission from the source. Information obtained in the course of confidential services, such as refereeing manuscripts or grant applications, must not be used without the explicit written permission of the author of the work involved in these services.

### **Authorship of the paper**

Authorship should be limited to those who have made a significant contribution to the conception, design, execution or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

### **Hazards and human or animal subjects**

If the work involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, the author must clearly identify these in the manuscript. If the work involves the use of animal or human subjects, the author should ensure that the manuscript contains a statement that all procedures were performed in compliance with relevant laws and institutional guidelines and that they have been approved by the appropriate institutional committee(s). Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

### **Disclosure and conflicts of interest**

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed. Examples of potential conflicts of interest which should be disclosed include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/ registrations, and grants or other funding. Potential conflicts of interest should be disclosed at the earliest stage possible.

### **Fundamental errors in published works**

When an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper. If the editor or the publisher learns from a third party that a published work contains a significant error, it is the obligation of the author to promptly retract or correct the paper or provide evidence to the editor of the correctness of the original paper.

## Editorial

In modern years, aesthetics has become quite important in every aspect of everyday life: following the hundreds of journals, magazines, blogs and websites pointing their attention towards this interesting and fascinating topic, the request for aesthetic medicine has increased manifolds.

Aesthetic Medicine is a new 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 unaesthetic sequel 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, a program of education is similarly important.

Furthermore, the line between health and beauty is extremely thin: psychosomatic disorders resulting from low self-esteem due to 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 which is not involved in Aesthetic Medicine: endocrinologists, gynecologists, angiologists, psychologists and psychiatrists, plastic surgeons, dermatologists, dieticians, physiotherapists, orthopedists, physical education instructors, massophysiotherapists, podologists, 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 esthetic 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 the 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 Medecine Esthetique, 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. Starts 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 face and body.

At the beginning of the '80s, viable medical procedures started to emerge in Europe for aesthetic and cosmetic purposes. Mostly, at that time, they were imported from the United States: those included collagen injections for wrinkles (Zyderm by Dr. Stegman), and chemical peels (phenol by Dr. Baker, TCA by Dr. Oba- gi). 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 '90s, 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 postop. CO2 laser was replaced with the gentler Nd-YAG and Erbium lasers and more recently with 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 low risk of post- op complications. 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.

About lipolysis, new data and recent publications have explained that radiofrequency, ultrasounds and cryolyse could have positive action to dissolve fat and to improve some unaesthetic disorders like cellulite.

These non invasive procedures intend to replace the surgical liposculpture with success.

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 M decine Esth tique (U.I.M.E.). Aesthetic Medicine is taught in 8 countries (France, Italy, Spain, Brazil, Argentina, Mexico, Venezuela, Kazakhstan) in universities that deliver UIME's diplomas after 3 to 4 years of studies.

## What is the future of Aesthetic Medicine?

In the last few decades, patients' desires to look and feel younge, have fueled Aesthetic Medicine and Cosmetic Dermatology: many different procedures have been developed to satisfy the demands.

As life-span have increased, patients today are not only asking about aesthetic procedures, they are also asking for a way to stay in good physical conditions in the last decades of their lives. As a direct result, Anti-Aging Medicine, which covers skin aging and general aging, has recently emerged and expanded very quickly. Anti-Aging Medicine can offer senior patients better nutrition, dietary supplementation with vitamins, minerals, 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 wellness 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 its future will be bright.

**Jean-Jacques Legrand**  
MD General Secretary of UIME

## **Aesthetic Medicine: a bioethic 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 in which traced the pathway of the discipline and of the Scientific Society, still valid and projected into the future.

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

In the late ‘60s, what was called in Italy Aesthetic Medicine, moved its first steps thanks to “remise en forme and anti aging projects” imported from the experience the “Institutul de geriatrie Bucuresti”, directed by Dr. Ana Aslan.

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

The worldwide diffusion and the efforts of Industries born on the wave of the phenomenon have often led 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 of beauty, but it is a balance between body and mind, and the role of the doctor is to take care of the Person globally and not only focusing on the correction of “a badly accepted blemish”.

Faithful to the teaching of my Master had almost 50 years ago, this new journal will have the task of elevating the human resources, aligning and validating methodologies, but above all affirming the humanitas of the medical art in its purest sense 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 with insufficient scientific studies.

However, they sell it anyway. I think that doctors must learn that the first thing to ask about a medical device is the scientific background regarding that product: patients treated, follow up period, adverse events and, most of all, publications.

With this new International Journal completely 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 wants to stimulate scientific production in this discipline to increase safety and quality in aesthetic medical procedures.

Another important goal of the Journal is to catalyze the proposal of 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 production 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 all over the world.

**Emanuele Bartoletti, MD**

*Managing Editor*

*President of the Italian Society of Aesthetic Medicine*

# INTERNATIONAL SOCIETIES and NATIONAL SOCIETIES OF AESTHETIC MEDICINE

## INTERNATIONAL SOCIETY OF AESTHETIC MEDICINE

154, rue Armand Silvestre - 92400 Courbevoie  
France Honorary Presidents: C.A. BARTOLETTI † (Italy), A. BOURRA (Morocco), M. DELUNE (USA), A. FARIA DE SOUZA (Brazil), J. FONT-RIERA † (Spain), G. MARZULLO (Chile), R. PINTO (Argentina), J. HEBRANT (Belgium), A. ELBAUM (Uruguay), J.J. LEGRAND (France), M. OUGHANEM (Algeria)

President: V. GARCIA GUEVARA (Venezuela)  
Vicepresident: A. IGNACIUK (Poland)  
General Secretary: E. BARTOLETTI (Italy)  
General Secretary in charge of the American Continent: R. PINTO (Argentina)  
of Africa and Middle East: A. BOURRA (Morocco)

## ALGERIAN SOCIETY OF AESTHETIC MEDICINE

Bt.T1, N°2, Diar Es Saada, El Madania, Algiers - Algeria  
[oughanem\\_m@hotmail.com](mailto:oughanem_m@hotmail.com) - [www.same-dz.com](http://www.same-dz.com)  
President: M. OUGHANEM

## ARGENTINE SOCIETY OF AESTHETIC MEDICINE

Avenida Santa Fe 3288, 4°A - 1425 Buenos Aires - Argentina  
[pinto@soarme.com](mailto:pinto@soarme.com) - [www.soarme.com](http://www.soarme.com)  
President: R. PINTO

## BELGIAN SOCIETY OF AESTHETIC MEDICINE

Chaussée de Marche 390 - 5100 Jambes - Belgium  
[jean.hebrant@skynet.be](mailto:jean.hebrant@skynet.be) - [www.aesthetic-medicine.be](http://www.aesthetic-medicine.be)  
President: J. HEBRANT

## BRASILIAN ASSOCIATION OF AESTHETIC MEDICINE SCIENCES

Avenida Vereador José Diniz - 2480 - Brooklin - Sao Paulo CEP 04604-004  
[clara\\_santos@terra.com.br](mailto:clara_santos@terra.com.br)  
President: C. SANTOS

## CANADIAN ASSOCIATION OF AESTHETIC MEDICINE

c/o CongressWorld Conferences Inc  
220-445 Mountain Highway - North Vancouver, BC, Canada V7J 2L1  
[drvanaardt@nslaser.com](mailto:drvanaardt@nslaser.com) - [www.caam.ca](http://www.caam.ca)  
President: R. VAN AARDT

## CHILEAN ASSOCIATION OF AESTHETIC MEDICINE

Avda President Riesco 2955, apto 1102, Las Condes Santiago - Chile  
[info@sochme.cl](mailto:info@sochme.cl) - [www.achme.cl](http://www.achme.cl)  
President: G. MARZULLO

## CHINA ACADEMY OF AESTHETIC MEDICINE

Department of Stomatology, General Hospital of PLA 28 Fuxing road, BEIJING  
100853 - China  
[zhengxing@vip.163.com](mailto:zhengxing@vip.163.com)  
President: LI SHIRONG

## COLOMBIAN ASSOCIATION OF AESTHETIC MEDICINE

Calle 4 Sur, n. 43 a 195 - Oficina 141 - Bloque B - Medellin - Colombia  
[acicme@gmail.com](mailto:acicme@gmail.com) - [www.acicme.com.co](http://www.acicme.com.co)  
President: G. ARROYAVE ESTRADA

## CROATIAN ASSOCIATION OF AESTHETIC MEDICINE

Joakima Rakovca 10, HR-51410 Opatlia  
[dr.bunar@gmail.com](mailto:dr.bunar@gmail.com) - [www.huem.hr](http://www.huem.hr)  
President: E. BUNAR

## ECUADORIAN SOCIETY OF AESTHETIC MEDICINE

Ave de los Shyris 344 y Eloy Alfaro, Edificio Parque Central, Oficina 609 - Quito - Ecuador  
[seem2008cg@gmail.com](mailto:seem2008cg@gmail.com) - [www.seem.com.ec](http://www.seem.com.ec)  
President: V. TINOCO KIRBY

## FRENCH SOCIETY OF AESTHETIC MEDICINE

154, rue Armand Silvestre - 92400 Courbevoie - France  
[jjlegrand-md@sfme.info](mailto:jjlegrand-md@sfme.info) - [www.sfme.info](http://www.sfme.info)  
President: J.J. LEGRAND

## GEORGIAN SOCIETY OF AESTHETIC MEDICINE

Irakli Abashidze str. 77, Tbilisi 0162 - Georgia  
[info@gsoam.ge](mailto:info@gsoam.ge) - [www.gsoam.ge](http://www.gsoam.ge)  
President: E. UGREKHELIDZE

## ITALIAN SOCIETY OF AESTHETIC MEDICINE

Via Monte Zebio 28 - 00195 Rome - Italy  
[sime@lamedicinaestetica.it](mailto:sime@lamedicinaestetica.it) - [www.lamedicinaestetica.it](http://www.lamedicinaestetica.it)  
President: E. BARTOLETTI

## KAZAKHSTAN ASSOCIATION OF AESTHETIC MEDICINE AND PLASTIC SURGERY

139, Tulebaeva Str. - 480091 Almati, Medeouski  
[arugulnar@hotmail.com](mailto:arugulnar@hotmail.com) - [www.estetic.kz](http://www.estetic.kz)  
President: G. ZHUMATOVA

## KOREAN ACADEMY OF AESTHETIC MEDICINE

Han-Song B.D. 801, Myeong-dong, Jung-gu, Seoul - Korea  
[hanwooha@nate.com](mailto:hanwooha@nate.com)  
President: Wooha Han

## MEXICAN SCIENTIFIC SOCIETY OF AESTHETIC MEDICINE

Cincinnati 81-307 - Col. Noche Buena - Mexico D.F. 03720  
[bmillerkobisher@yahoo.com](mailto:bmillerkobisher@yahoo.com) - [www.facebook.com/Sociedad.Mexicana.Cientifica.Medicina.Estetica](http://www.facebook.com/Sociedad.Mexicana.Cientifica.Medicina.Estetica)  
President: J-B. MILLER KOBISHER

## MOROCCAN SOCIETY OF AESTHETIC MEDICINE

19, place du 16 Novembre - 20250 Casablanca - Morocco  
[drbourra@hotmail.com](mailto:drbourra@hotmail.com) - [www.dermastic.asso.ma](http://www.dermastic.asso.ma)  
President: A. BOURRA

## POLISH SOCIETY OF AESTHETIC AND ANTI-AGING MEDICINE OF POLISH MEDICAL SOCIETY

Ujazdowskie 22, 00-478 Warszawa - Poland  
[psme@psme.waw.pl](mailto:psme@psme.waw.pl) - [www.ptmeiaa.pl](http://www.ptmeiaa.pl)  
President: A. IGNACIUK

## RUSSIAN NATIONAL AESTHETIC MEDICINE SOCIETY

12/3 Fotievoi Street, Pol. n.3 - of.512 - 119333 Mosca - Russia  
[o.panova@rs-am.ru](mailto:o.panova@rs-am.ru)  
President: O. PANOVA

## AESTHETIC AND ANTI AGING MEDICINE SOCIETY OF SOUTH AFRICA

PO Box 1190, Montana Park 0159, Prêtoría  
[cobus@drcobus.co.za](mailto:cobus@drcobus.co.za)  
President: J. VAN NIEKERK

## SPANISH SOCIETY OF AESTHETIC MEDICINE

Ronda General Mitre, 210  
08006 Barcelona - Spain  
[secretaria@seme.org](mailto:secretaria@seme.org) - [www.seme.org](http://www.seme.org)  
President: P. VEGA

## SWISS SOCIETY OF AESTHETIC MEDICINE

La Clinique - avenue de Collonge, 43 - CH - 1820 Territet - Montreux  
[s.lehuu@laclinique.ch](mailto:s.lehuu@laclinique.ch) - [www.ssme.ch](http://www.ssme.ch)  
President: S. LEHUU

## SOCIETY OF AESTHETIC MEDICINE IN TURKEY

Rumeli Caddesi Durak Apt N° 2, D.7 - Nisantasi, Istanbul  
[subasihasanm@superonline.com](mailto:subasihasanm@superonline.com) - [www.estetiktipdernegi.org.tr](http://www.estetiktipdernegi.org.tr)  
President: H. SUBASI

## UKRAINIAN SOCIETY OF AESTHETIC MEDICINE

Bunina Street, 10 Odessa 65026 - Ukraine  
[office@virtus.ua](mailto:office@virtus.ua) - [usam.org.ua](http://usam.org.ua)  
President: V. TSEPKOLENKO

## AESTHETIC MEDICINE SOCIETY OF URUGUAY

Ave. Sarmiento, 2470 - 11300 Montevideo - Uruguay  
[alberto@drelbaum.com](mailto:alberto@drelbaum.com) - [www.sume.com.uy](http://www.sume.com.uy)  
President: A. ELBAUM

## AMERICAN ACADEMY OF AESTHETIC MEDICINE

24671 La Vida Drive - Laguna Niguel, Ca 92677 - USA  
[mdelune@aol.com](mailto:mdelune@aol.com) - [www.aamed.org](http://www.aamed.org)  
President: M. DELUNE

## AESTHETIC MEDICINE SOCIETY OF VENEZUELA

Av. Sucre de Los Dos Caminos, entre 4ta y 5ta transversal,  
Res. Centro Parque Boyacá, Edificio Centro, Piso 20, Off. 201 1070 Caracas - Venezuela  
[fuceme@gmail.com](mailto:fuceme@gmail.com) - [www.fuceme.org](http://www.fuceme.org) - [www.sociveme.org](http://www.sociveme.org)  
President: V. GARCIA GUEVARA

## PORTUGUESE SOCIETY OF AESTHETIC AND ANTI-AGING MEDICINE

Rua Maria Vitoria Bourbon Bobone, Lote 21, N°41, Apto. 201 P-3030-502 Coimbra  
[joao.vale@spme.pt](mailto:joao.vale@spme.pt) - [www.spme.pt](http://www.spme.pt)  
President: J.P. VALE

# Effects of an isocaloric low glycemic load diet in polycystic ovary syndrome: an update

Annalisa Panico<sup>1</sup>, Roberto Marcantonio<sup>2</sup>, Gelsy Arianna Lupoli<sup>1</sup>, Giovanni Messina<sup>3</sup>, Giovanni Lupoli<sup>1</sup>

<sup>1</sup>Department of Clinical Medicine and Surgery, University of Naples "Federico II"

<sup>2</sup>Department of Public Health, University of Naples "Federico II"

<sup>3</sup>Department of Clinical and Experimental Medicine, University of Foggia

Short title: PCOS and Diet

## Abstract

**Background:** Polycystic ovary syndrome (PCOS) is characterized by phenotypic heterogeneity and a wide variety of consequences. About half of PCOS women are overweight or obese and their obesity may be a contributing factor to PCOS pathogenesis through different mechanisms. Furthermore, lean women with PCOS are also considered to be at an increased risk of metabolic disturbances.

**Aim:** The aim of the study was to evaluate the effects of isocaloric and isoenergetic moderately low glycemic load diets (diet A, GL=79-105) versus moderately high glycemic load diets (diet B, GL=123-134) on metabolic patterns of polycystic ovary syndrome.

**Methods:** 15 women with this syndrome (age:  $24.2 \pm 3.1$  y; BMI:  $28.9 \pm 5.1$  kg/m<sup>2</sup>), were randomly assigned, according to a cross-over protocol, for 3 months to diet A and for the subsequent 3 months to diet B. Clinical and metabolic parameters were evaluated at baseline and after 3 and 6 months of observation.

**Results:** In conditions of stable body weight, statistically significant reductions of 2h-after breakfast serum glucose ( $p < 0.011$ ) and 2h-after breakfast-insulin ( $p = < 0.001$ ), and a significant improvement in menstrual cycle, was observed only after the low glycemic load diet. **Conclusions:** An isocaloric and isoenergetic moderately low glycemic load diet, independent of weight loss and physical activity, ameliorates hyperinsulinemia and improves menstrual regularity.

## Keywords

Low glycemic load diet, polycystic ovary syndrome

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

**Annalisa Panico, MD**

Department of Clinical Medicine and Surgery, Federico II University, - Via Pansini 5, 80131 Naples

Email: [annalisa.panico76@gmail.com](mailto:annalisa.panico76@gmail.com)

Phone: 3332086794

Phone/Fax: +39 081/7462429

## Introduction

Polycystic ovary syndrome (PCOS) is a heterogeneous endocrine disorder with prevalence rates ranging from 5% to 13.9% in women of reproductive age. PCOS is mainly characterized by chronic anovulation, polycystic ovary morphology, and hyperandrogenism<sup>1,2,3</sup>.

PCOS is frequently associated with obesity, insulin resistance (IR), diabetes, hypertension and dyslipidemia, conditions conducive to increased cardiovascular disease (CVD) risk<sup>4,5,6</sup>. The percentage of insulin resistance in PCOS has been reported at between 44 to 70%<sup>7,8</sup> using surrogate markers. There is a general agreement that obese women with PCOS are insulin resistant, but IR should be assessed in all PCOS women, both lean and overweight subjects<sup>9</sup>.

Weight reduction in PCOS improves metabolic health<sup>10</sup>, although, the optimal diet composition is unclear. High-protein diets cause<sup>11</sup> greater satiety and have a greater thermogenic effect<sup>12</sup>. They are recommended for the reduction of the loss of lean tissue mass<sup>13</sup> during weight loss<sup>14</sup>, for the decrease of serum lipid profile, and for postprandial insulin sensitivity<sup>15</sup>. Data from several recent studies has promoted also high-fat<sup>16</sup>, low carbohydrate diets, up to ketogenic diets for their beneficial effects on glucose homeostasis and reduction of body weight and hyperinsulinemia<sup>17</sup>.

Dietary omega-3 polyunsaturated fatty acids (PUFAs) are known to reduce triglyceride and cholesterol levels, and to ameliorate hyperinsulinemia in PCOS patients<sup>18</sup>. However, their impact on reduction in androgens is controversial<sup>19</sup>.

The concept of reducing dietary glycemic index (GI) or glycemic load (GL) in the treatment of PCOS has also received considerable interest. In the general population, this approach can optimally improve the metabolic profile. At present, data on the effect of modulation of GI or GL on insulin sensitivity, acute satiety, and long-term weight loss and weight-loss maintenance<sup>19</sup> are conflicting. A low glycemic load diet contains carbohydrates that minimize changes in post prandial glucose levels and leads to a sustained reduction in hyperinsulinemia, in fasting glucose levels and in serum lipids in PCOS<sup>20,21</sup>. However, the realization of any long term benefits requires compliance to the low glycemic load diet. Currently, few studies evidence the beneficial effects of a low glycemic load diet on metabolic profiles of PCOS, regardless of weight reduction.

The aim of this study was to evaluate the effects of two isocaloric and isoenergetic diets differing in glycemic load (GL) on metabolic patterns PCOS syndrome: diet A, with a moderately low glycemic load (GL=79-105) versus diet B, with a moderately high glycemic load (GL=123-134) in order to broaden the results of our previous preliminary study<sup>22</sup>.

## Materials and Methods

PCOS patients were selected at the Department of Clinical Medicine and Surgery, University "Federico II", Naples (Italy) and they all met the Rotterdam criteria of ESHRE/ASRM PCOS Consensus Workshop Group (presence of two out of the following three features: menstrual irregularity; clinical or biochemical hyperandrogenism; positive ultrasound presentation of polycystic ovaries by scan)<sup>3</sup>. Only 15 patients, age-matched, with a similar socio-economic background (age: 24.2±3.1 y; BMI: 28.9±5.1 kg/m<sup>2</sup>) duly completed the protocol.

Exclusion criteria were the following: pregnancy, endocrine disorders, and the use of oral contraceptive or insulin-sensitizing agents. Patients participating to regular physical activity were also excluded. Patients were randomly provided with, according to a cross-over design, an isocaloric and isoenergetic diet with either a moderately low glycemic load or a moderately high glycemic load for 3 months, respectively. The Glycemic Index (GI) is a quantitative assessment of foods based on postprandial blood glucose response, which is often expressed as a percentage of the response to an equivalent carbohydrate portion of a reference food (white bread or glucose)<sup>23</sup>. The glycemic load, which assesses the total glycemic effect of the diet and has proved very useful in epidemiologic studies, is the product of the dietary GI and total dietary carbohydrate:  $GL = [GI \times CHO(g)] / 100$ . The GI was determined by using the Brand-Miller tables<sup>23,24</sup>; such tables adopt glucose as a parameter for carbohydrate. Average daily GI was calculated as [(grams of carbohydrate from food item/total daily grams of carbohydrate) × GI value of the food item]. Low GI foods are defined as having a value < 56; medium GI foods a value of 56-69, and high GI foods a value ≥ 70. Dietary GL was calculated by multiplying the daily GI of each food by the amount of carbohydrate consumed and dividing the product into 100<sup>25</sup>. To determine energy requirement and consequentially the prescription of the relative diet, the Harris Benedict equation was used so to predict basal metabolic rate adjusted for physical activity level; Table 1 reports composition of 1500-1800 kcal diets with low or moderately high Glycemic Load. The nutrition education protocol was developed by dietitians. A dietitian initially instructed the subjects on quantification and recording of their daily food intakes. Follow-up counseling occurred every 6 days until the end of the study. At this visit, diet prescription and nutrition goals were reviewed. The calculation of the Homa index was performed on the parameters of fasting plasma glucose and insulin concentrations, using the following formula:  $HOMA\ index = \text{fasting glucose (mmol/L)} \times \text{fasting insulin (mU/L)} / 22.5$ . The cut-off point was set to more than 2.5. A complete physical examination was performed on each patient, at baseline and after 3 and 6 months, including a hirsutism exam using the Ferriman and Gallwey score. Each body area was visually scored on a scale of zero to four; a score of zero indicated no terminal hair growth, while a score of four indicated full male pattern terminal hair growth. The evaluation of acne included clinical examination, grading and lesion counting. Additionally, height, weight, and age, were noted, and body mass index (BMI) was calculated for each patient. At baseline

and after 3 and 6 months, all subjects underwent pelvic ultrasonography and venous blood sampling to evaluate metabolic parameters (total cholesterol, HDL cholesterol, triglycerides, fibrinogen, serum glucose, C peptide, and insulin levels, fasting and two hours after breakfast). All participants provided data with written health questionnaires and menstrual cycle calendars. Patients were advised not to perform additional physical exercise compared to the standard physical activity recommendations (150-minute per week of moderate exercise regimen), to avoid interference or bias with the prescribed dietary program.

### Statistical analysis

Data is expressed as mean ± SD and was log transformed before analysis when skewed. Two-tailed analysis was performed by using SPSS13 for Windows (SPSS, Inc., Chicago, IL, USA).

Statistical significance was set at  $p < 0.05$ .

Baseline parametric data was assessed by using a one-way ANOVA. For comparison between time points, a repeated measure of ANOVA was used for parametric data. Bonferroni adjustments were performed on multiple comparisons.

### Results

Both diets were well tolerated. There was an improvement in menstrual cycle in 9 out of the 15 subjects (60%) during the low glycemic load diet (diet A) and in 3 patients (20%) during the high glycemic load diet (diet B) ( $p = 0.032$ ).

Examination findings reveal no improvement of hirsutism and acne after both diets. Change of metabolic variables after Diet A and B in the 15 PCOS patients are shown in Table 2. The mean body weight and BMI changes from baseline to 3 months after both diets were not statistically significant ( $p = 0.784$  after diet A vs  $p = 0.914$  after diet B) (Table 2).

Mean fasting HOMA-R changes from baseline to 3 months after both diets were not statistically significant ( $p = 0.204$  after diet A vs  $p = 0.089$  after diet B). As compared with baseline values, three months after diet A, there were statistically significant reductions of 2h-after breakfast serum glucose (from  $89.4 \pm 8.4$  to  $78.1 \pm 4.2$ ,  $p < 0.011$ ) and 2h-after breakfast-insulin (from  $47.2 \pm 25.3$  to  $21.3 \pm 7.9$ ,  $p < 0.001$ ) (Figures 1 and 2). Hyperinsulinemia contributes to the hyperandrogenism of PCOS by stimulating ovarian androgen production and decreasing serum sex hormone-binding globulin (SHBG) concentrations. Following three months of diet B, a trend towards a reduction in circulating in serum glucose and 2h-after breakfast-insulin levels was observed, but in none of the cases had it reached statistical significance (Table 2).

	Low GL Diets				Moderately High GL Diets			
	1500/6280		1800/7536		1500/6280		1800/7536	
Energy Kcal /Kj	1500/6280		1800/7536		1500/6280		1800/7536	
GI	63		69		66		68	
GL	79		105		123		134	
	g	%	g	%	g	%	g	%
Protein	67	18	84	18	78	20	85	19
Carbohydrate	172	44	219	45	207	50	244	52
Starch	69		97		62		82	
Oligosaccharide	64		77		68		74	
Lipids	62	38	76	37	51	30	57	29
SFA	13	8	20	10	11	6.6	12	5
MUFA	34	21	38	19	25	15	28	14
PUFA	7	4	7	3.5	6	3.6	6	3
Ω 3	1.9	1	2.26	1	2.01	1.2	1.7	0.8
Cholesterol (mg)	165		218		186		187	
Fiber (g)	25		35		34		44	
Calcium (mg)	681		1191		1003		1027	
Phosphorus (mg)	1.055		1513		1422		1490	
Sodium (mg)	1039		1446		956		1024	
Potassium (mg)	3478		3582		2947		3937	
Iron (mg)	15		13		14		17	

Table 1 - Characteristics of low and moderately high GL diets.

	Baseline	3 months DIET A		3 months DIET B	
			p value		p value
Weight (kg)	72.1±12.1	70.3±10.9	0.671	70.6±10.8	0.722
BMI (kg/m <sup>2</sup> )	28.9±5.1	28.4±4.8	0.784	28.7±5.0	0.914
Fasting glucose (mg/dl)	79.1±3.4	77.2±7.1	0.358	76.6±6.2	0.182
Fasting insulin (μU/ml)	13.4±12.9	9.3±7.2	0.292	7.8±5.6	0.134
HOMA-IR	2.7±2.4	1.8±1.2	0.204	1.5±1.1	0.089
2h-after breakfast glucose (mg/dl)	89.4±8.4	78.1±4.2	<0.001	95.9±10.1	0.066
2h-after breakfast insulin (μU/ml)	47.2±25.3	21.3±7.9	<0.001	43.2±15.7	0.607

Table 2 - Change of metabolic variables after Diet A and B in 15 PCOS patients.

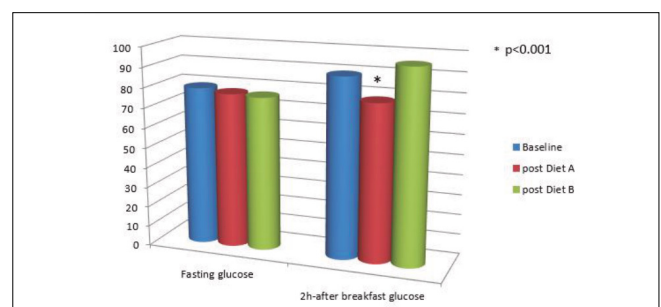


Figure 1 - Change of fasting and 2h after breakfast glucose after Diet A and B.

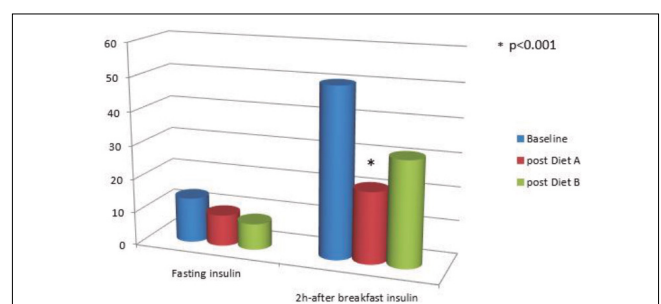


Figure 2 - Change of fasting and 2h after breakfast insulin after Diet A and B.



## Discussion and Conclusions

It is thought that patients affected by PCOS have a genetic predisposition to insulin resistance of skeletal muscle leading to an elevation in insulin secretion that stimulates testosterone production from the ovaries, which remain sensitive to insulin action. Infertility, hirsutism, and obesity are characteristics of the disorder. In addition, women with PCOS are at an elevated risk of developing both T2D and cardiovascular disease, presumably due to their insulin resistance and hyperinsulinism. Although treatment with oral contraceptives and other drugs that alter the reproductive-endocrine axis can alleviate symptoms, there is a need for nonpharmacological treatment options. That diet modification through carbohydrate restriction could alleviate symptoms by lowering insulin secretion is a possibility worth pursuing<sup>26</sup>. Weight reduction through energy restriction has been shown to exert positive influences on both metabolic and hormonal aspects of this condition. To date, nutritional studies in PCOS patients have focused on the effects of energy restriction and weight loss.

The effects of dietary composition, alterations in carbohydrate amount and type have also been investigated, and more recently, dietary fatty acids, with a particular emphasis on PUFA, have been shown to decrease insulin resistance, prevent excess insulin secretion, and, consequently, decrease the androgen excess and improve gonadal function in PCOS<sup>11-15</sup>.

Previous studies have reported that women on high protein diets experienced a significant weight loss and a decrease in their serum glucose level<sup>26,27</sup>.

Some studies have shown that protein-enriched diets can lead to greater weight loss and improvements in biomarkers of metabolic syndrome than standard protein diets. On the contrary, some high protein diets do not produce significant weight loss, causing a high percentage of adults to stop the diet after a short period of time and return to their original weight<sup>28,29,30</sup>.

Other findings have reported that a low-GI hypocaloric diet enhanced insulin sensitivity in a range of subjects, including individuals with type 2 diabetes and PCOS patients<sup>31</sup>. Interestingly, some authors have reported a significant interaction between diet and metformin use such that the combination of a low-GI diet + metformin use was associated with the greatest improvements in insulin sensitivity<sup>32</sup>. In diabetic patients, evidence from studies has suggested that a low-GI hypocaloric diet improved glycemic control reduced waist circumference and reduced weight by increasing satiety and by promoting fat oxidation at the expense of carbohydrate oxidation<sup>33,34</sup>. The metabolic profile well known in women with PCOS is equivalent to the insulin resistance syndrome, a clustering within an individual with hyperinsulinemia, mild glucose intolerance, dyslipidemia, and hypertension. The insulin resistance syndrome has been recognized as a risk factor for developing type 2 diabetes and CVD not only in obese and overweight patients, but also in normal weight women with PCOS where weight loss is not a choice for their management. Moreover, recent studies have suggested that compared with either aerobic or resistance training alone, combined aerobic-resistance training is more efficacious for improving insulin

sensitivity and reducing abdominal fat in a range of obese patient groups<sup>35,36</sup>. The improvement of insulin resistance and the decrease of insulin concentration and action can be achieved in different ways: if overweight or if obesity is present, by reducing body weight with lifestyle modifications; by using insulin-sensitizing agents, or by using antiandrogens. In fact, it has been demonstrated that long-term treatment with antiandrogens may improve insulin sensitivity in both normal weight and obese PCOS women presenting an insulin-resistant state, even without changes in body weight<sup>37</sup>.

This updated study<sup>22</sup> confirms the potential benefits of an isocaloric and isoenergetic diet with a low GI, also related to a relatively high content of unsaturated lipids (see table 1), for the treatment of PCOS, regardless of weight loss and physical activity. Our sample is low due to the high difficulties in carrying out all the steps contemplated by the protocol.

In summary, our study has shown that an isocaloric and isoenergetic diet with a low GI and a moderately high content of unsaturated lipids leads to a significant reduction in serum glucose and insulin levels two hours after breakfast and improved menstrual regularity in PCOS women over a three-month period, compared with a conventional, relatively high GI, isocaloric diet.

In our hypothesis improved insulin resistance per se, independent of weight loss, may positively affect menstrual cycle in PCOS, as suggested by the higher prevalence of improved menstrual cycles after diet A versus diet B.

In recent years, there has been an increased focus on the potential beneficial effects of specific dietary fatty acids for chronic diseases including insulin resistance and cardiovascular disease. It has been shown that replacement of dietary carbohydrate with PUFA in a reduced energy diet may offer additional health benefits in the management of PCOS. The adoption of healthy dietary patterns should be encouraged among women with PCOS, as they are rich in dietary fiber, antioxidants and anti-inflammatory nutrients, leading to greater satiety, and anti-hyperlipidemic, antihypertensive and antidiabetic properties<sup>16</sup>. Some authors have proposed that n-3 PUFAs may improve insulin sensitivity by decreasing the production of inflammatory cytokines including tumor necrosis factor alpha (TNF- $\alpha$ ), interleukin 6 (IL-6) and increasing secretion of the anti-inflammatory hormone adiponectin<sup>38</sup>. Fatty acids and their derivatives also have a role to play in various aspects of reproduction, and are involved in oocyte fertilization, as well as fetal and infant development<sup>39,40</sup>.

Ongoing work within our research group has suggested that supplementing the diet of women with PCOS with LC n-3 PUFA may have an anti-androgenic effect, mediated by a decrease in the plasma n-6:n-3 ratio rather than a direct functional effect of n-3 PUFA<sup>41</sup>.

In addition to the antiandrogen effect of PUFAs, lifestyle modification, such as diet re-calibration and increased physical activity, is considered as the first-line treatment for PCOS women: a modest weight loss in obese PCOS women of only 5% of initial body weight can result in pregnancy, while a weight loss of 5-10% can reduce hyperandrogenism and insulin levels, mostly in obese PCOS women<sup>17</sup>.

To date, the composition of the optimal diet for women with PCOS is not yet known, but such a diet must not only assist short term with weight management, symptoms and fertility, but also specifically target the long-term risks of type 2 diabetes and CVD. With insulin resistance and compensatory hyperinsulinemia now recognized as a key factor in the pathogenesis of PCOS, it has become clear that reducing insulin levels and improving insulin sensitivity are an essential part of management. Diet plays a significant role in the regulation of blood glucose and insulin levels, yet research into the dietary management of PCOS is lacking and most studies have focused on energy restriction rather than dietary composition per se. Our data has shown that a moderately low glycemic load is recommended for managing PCOS. This diet is sufficient to significantly improve hyperinsulinemia, restore ovulation and improve menstrual regularity. The metabolic effects of this dietary program resulted independent of pharmacological therapy, weight loss and exercise and this represents an important tool, considering the chronic nature of PCOS and its high prevalence in young age.

Realization of any long term benefits such as metabolic syndrome and CVD prevention in PCOS would require compliance to the dietary program. This study suggests that compliance to a moderately low glycemic load diet is possible over a three month period.

The benefits of lifestyle intervention in people with PCOS show that it is possible for dietary modification to ameliorate metabolic parameters and the risk of long term health problems linked with insulin resistance and it is important that this data has been confirmed on a larger number of patients with PCOS in this updated study.

#### **Disclosure Statement**

All authors have not actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three (3) years of beginning the work submitted that could inappropriately influence (bias) their work. This research did not receive any specific grant from any funding agency in the public, commercial or not-for-profit sector.

REFERENCES

- Norman RJ, Dewailly D, Legro RS, Hickey TE. Polycystic ovary syndrome. *Lancet*. 2007; 370(9588):685-697.
- Melo AS, Vieira CS, Barbieri MA, et al. High prevalence of polycystic ovary syndrome in women born small for gestational age. *Hum Reprod*. 2010; 25(8):2124-2131.
- Rotterdam ESHRE/ASRM-Sponsored PCOS consensus workshop group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome (PCOS). *Hum Reprod*. 2004; 19(1):41-7.
- Dunaif A, Segal KR, Futterweit W, Dobrjansky A. Profound peripheral insulin resistance, independent of obesity, in polycystic ovary syndrome. *Diabetes*. 1989; 38(9):1165-1174.
- Dunaif A. Insulin resistance and the polycystic ovary syndrome: mechanism and implications for pathogenesis. *Endocr Rev*. 1997; 18(6):774-800.
- Ehrmann DA. Polycystic ovary syndrome. *N Engl J Med*. 2005; 352(12):1223-1236.
- de Paula Martins W, Santana LF, Nastri CO, Ferriani FA, de Sa MF, Dos Reis RM. Agreement among insulin sensitivity indexes on the diagnosis of insulin resistance in polycystic ovary syndrome and ovulatory women. *Eur J Obstet Gynecol Reprod Biol*. 2007; 133(2):203-207.
- Ciampelli M, Leoni F, Cucinelli F, et al. Assessment of insulin sensitivity from measurements in the fasting state and during an oral glucose tolerance test in polycystic ovary syndrome and menopausal patients. *J Clin Endocrinol Metab*. 2005; 90(3):1398-1406.
- Morciano A, Romani F, Sagnella F, et al. Assessment of insulin resistance in lean women with polycystic ovary syndrome. *Fertil Steril*. 2014; 102(1):250-256.
- Hoeger KM. Obesity and life style management in polycystic ovary syndrome. *Clin Obstet Gynecol*. 2007; 50(1):277-94.
- Toscani MK, Mario FM, Radavelli-Bagatini S, Wiltgen D, Matos MC, Spritzer PM. Effect of high-protein or normal-protein diet on weight loss, body composition, hormone, and metabolic profile in southern Brazilian women with polycystic ovary syndrome: a randomized study. *Gynecol Endocrinol*. 2011; 27(11):925-30.
- Moran LJ, Noake SM, Clifton PM, Tomalinson L, Normann RJ. Dietary Composition in restoring reproductive and metabolic philosophy in overweight women with polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2003; 88(2):812-9.
- Douglas CC, Gower BA, Darnell BE, Ovalle F, Oster RA, Azziz R. Role of diet in the treatment of polycystic ovary syndrome. *Fertil Steril*. 2006; 85(3):679-88.
- Mavropoulos JC, Yancy WS, Hepburn J, Westman EC. The effects of a low-carbohydrate, ketogenic diet on the polycystic ovary syndrome: a pilot study. *Nutr Metab (Lond)*. 2005; 2:35.
- Kasim-Karakas SE, Herrmann R, Almario R. Effects of omega-3 fatty acids on intravascular lipolysis of very-low-density lipoproteins in humans. *Metabolism*. 1995; 44(9):1223-30.
- de la Iglesia R, Loria-Kohen V, Zulet MA, Martinez JA, Reglero G, Ramirez de Molina A. Dietary strategies implicated in the prevention and treatment of metabolic syndrome. *Int J Mol Sci*. 2016; 17(11):E1877.
- Baptiste CG, Battista MC, Trottier A, Baillargeon JP. Insulin and hyperandrogenism in women with polycystic ovary syndrome. *J Steroid Biochem Mol Biol*. 2010; 122(1-3):42-52.
- Stamets K, Taylor DS, Kunselman A, Demers LM, Pelkman CL, Legro RS. Randomized trial of the effects of two types of short term hypocaloric diets on weight loss in women with polycystic ovary syndrome. *Fertil Steril*. 2004; 81(3):630-637.
- Sloth B, Krog-Mikkelsen I, Flint A, et al. No differences in body weight decreased between a low-glycemic index and high-glycemic index diet but reduced LDL cholesterol after 10-wk and libitum intake of the low-glycemic-index diet. *Am J Clin Nutr*. 2004; 80(2):337-247.
- Moran LJ, Noakes M, Clifton PM, Wittert GA, Williams G, Norman RJ. Short-term meal replacements followed by dietary macronutrient restriction enhance weight loss in polycystic ovary syndrome. *Am J Clin Nutr*. 2006; 84(1):77-87.
- Gower BA, Goss AM. A lower-carbohydrate, higher-fat diet reduces abdominal and intermuscular fat and increases insulin sensitivity in adults at risk of type 2 diabetes. *J Nutr*. 2015; 145(1):177S-183S.
- Panico A, Lupoli GA, Cioffi I, et al. Effects of an isocaloric low-glycemic-load diet in polycystic ovary syndrome. *Nutritional Therapy and Metabolism*. 2014; 32(2):85-92.
- Omaga K, Omaga SO. Evaluation of the glycemic indices of three commonly eaten mixed meals in Okada, Edo State. *Food Sci Nutr*. 2017; 6(1):220-228.
- Atkinson FS, Foster-Powell K, Brand-Miller JC. International tables of glycemic index and glycemic load values: 2008. *Diabetes Care*. 2008; 31(12):2281-3.
- Bulló M, Casas R, Portillo MP, et al. Dietary glycemic index/load and peripheral adipokines and inflammatory markers in elderly subjects at high cardiovascular risk. *Nutr Metab Cardiovasc Dis*. 2013; 23(5):443-50.
- Thomson RL, Buckley JD, Noakes M, Clifton PM, Norman RJ, Brinkworth GD. The effect of a hypocaloric diet with and without exercise training on body composition, cardiometabolic risk profile, and reproductive function in overweight and obese women with polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2008; 93(9):3373-80.
- Mehrabani HH, Salehpour S, Amiri Z, Farahani SJ, Meyer BJ, Tahbaz F. Beneficial effects of a high-protein, low-glycemic-load hypocaloric diet in overweight and obese women with polycystic ovary syndrome: a randomized controlled intervention study. *J Am Coll Nutr*. 2012; 31(2):117-25.
- Moran LJ, Noakes M, Clifton PM, Tomlinson L, Galletly C, Norman RJ. Dietary composition in restoring reproductive and metabolic physiology in overweight women with polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2003; 88(2):812-9.
- Stern L, Iqbal N, Seshadri P, et al. The effects of low-carbohydrate versus conventional weight loss diets in severely obese adults: one-year follow-up of a randomized trial. *Ann Int Med*. 2004; 140:778-785.
- Slabber M, Barnard HC, Kuyi JM, Dannhauser A, Schall R. Effects of a low-insulin response, energy-restricted diet on weight loss and plasma insulin concentrations in hyperinsulinemic obese females. *Am J Clin Nutr*. 1994; 60(1):48-53.
- Marsh KA, Steinbeck KS, Atkinson FS, Petocz P, Brand-Miller JC. Effect of a low glycemic index compared with a conventional healthy diet on polycystic ovary syndrome. *Am J Clin Nutr*. 2010; 92(1):83-92.
- Herriot AM, Whitcroft S, Jeanes Y. A retrospective audit of patients with polycystic ovary syndrome: the effects of a reduced glycaemic load diet. *J Hum Nutr Diet*. 2008; 21(4):337-345.
- Heillbron LK, Noakes M, Clifton PM. The effect of high- and low-glycemic index energy restricted diets on plasma lipid and glucose profiles in type 2 diabetic subjects with varying glycemic control. *J Am Coll Nutr*. 2002; 21(2):120-7.
- Diana Thomas, Elizabeth J Elliott. *Low glycaemic index, or low glycaemic load, diets for diabetes mellitus*. 2009; The Cochrane Library 1.
- Fencki V, Fencki S, Yilmazer M, Serteser M. Decreased total antioxidant status and increased oxidative stress in women with polycystic ovary syndrome may contribute to the risk of cardiovascular disease. *Fertil Steril*. 2003; 80(1):123-7.
- Douglas CC, Norris LE, Oster RA, Darnell BE, Azziz R, Gower BA. Difference in dietary intake between women with polycystic ovary syndrome and healthy controls. *Fertil Steril*. 2006; 86(2):411-7.
- Carroll S, Dudfield M. What is the relationship between exercise and metabolic abnormalities? A review of the metabolic syndrome. *Sports Med*. 2004; 34(6):371-418.
- Sadeghi A, Djafarian K, Mohammadi H, Shab-Bidar S. Effect of omega-3 fatty acids supplementation on insulin resistance in women with polycystic ovary syndrome: meta-analysis of randomized controlled trials. *Diabetes Metab Syndr*. 2016; 11(2):157-162.

39. Chang RJ, Nakamura RM, Judd HL, Kaplan SA. Insulin resistance in non obese patients with polycystic ovarian disease. *J Clin Endocrinol Metab.* 1983; 57(2):356-9.
40. Diamanti-Kandarakis E, Piperi C, Spina J, et al. Polycystic ovary syndrome: the influence of environmental and genetic factors. *Hormones (Athens).* 2006; 5(1):17-34.
41. O'Connor A, Gibney J, Roche HM. Metabolic and hormonal aspects of polycystic ovary syndrome: the impact of diet. *Proc Nutr Soc.* 2010; 69(4):628-35.
42. Pasquali R, Antenucci D, Casimirri F, et al. Clinical and hormonal characteristics of obese amenorrheic hyperandrogenic women before and after weight loss. *J Clin Endocrinol Metab.* 1989; 68(1):173-9.

# Agarose gel - high patient satisfaction of a full-facial volume augmentation

Arna Shab<sup>1</sup>, Catharina Shab<sup>2</sup>

<sup>1</sup>MD, Private Practice for Dermatology and Aesthetic Medicine, Frankfurt/Main, Germany

<sup>2</sup>MD, Private Practice for Dermatology and Aesthetic Medicine, Frankfurt/Main, Germany

---

## Abstract

Agarose gel is a new generation of dermal filler. It is a sterile, biodegradable, viscoelastic, isotonic, transparent injectable gel implant, which was already approved and used for more than a decade. It can be used for face reconstruction and face modelling. Facial aging consistently produces increasing prominence of the midface, nasolabial folds, cheeks, jowls, chin and nose.

The aim of this article is to show agarose gel as at least equivalent to those products for full-facial treatment and non-surgical rhinoplasty.

This material provides a non-surgical method for volume augmentation and restoration of the face and structures like the aging nose. Injecting agarose gel is like to inject a liquid implant. Attention must be paid to the injection technique and the post injection treatment. Visible improvements are noted immediately.

Only mild bruising or hematoma are recorded as adverse events. The patients are highly pleased with the results and report that an excellent cosmetic result was obtained. The agarose gel was very well tolerated.

Agarose gel is at least equivalent to other dermal fillers for full-facial treatments and non-surgical rhinoplasty. The utilization of these fillers by trained professionals provides an effective and safe therapy for the management of the aging face.

## Keywords

Agarose gel, dermal filler, full-facial, augmentation, restoration, aging face, wrinkles

---

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

**Arna Shab, MD**

Address: Hanauer Landstrasse 151 - 153, Germany - 60314 Frankfurt/Main

Phone: + 49 (0) 69 48 00 94 40

E-mail: arna.shab@med-aesthet.de

## Introduction

In recent years there has been a growing interest in non-surgical procedures for facial rejuvenation. Hyaluronic acid (HA) and calciumhydroxyapatite (CHA) are currently the most widely used dermal filler for full facial treatments<sup>1</sup>. These provide a high level of comfort in the treatment (both for the practitioner and for the patient) and a long-lasting effect. In addition, these are safe substances with regard to their compatibility and local resistance<sup>2,3,4</sup>.

In addition, the proven safety of Agarose gel has also been a factor in their increased use. Although only rarely complications are reported<sup>5</sup>. Agarose is in principle not a completely new material in medicine. It has been used in the dental field for more than a decade<sup>6</sup>. The substance class is a neutral polysaccharide, it is completely biocompatible and thus degradable<sup>6</sup>.

The aim of this article is to show agarose gel as at least equivalent to those for full-facial treatment.

The following overview describes the possibilities of this treatment method.

## General approach

Detailed knowledge of the facial anatomy with the knowledge of changes in the age are necessary to achieve balanced and natural results after the injection. It is also essential to be familiar with the character of the dermal filler to be used. Each face region has its own perfect dermal filler for its purpose. Complete biodegradability, local resistance and good tolerability as well as perfect biocompatibility are indispensable properties of a suitable dermal filler.

The results of the filler injection are extremely technically and material dependent. It is necessary to place a 3-dimensional lattice of injected material below the surface of the skin to add volume, alter surface area and thicken skin or subcutaneous tissue. The degree of correction and the result depends heavily on the injection technique used and the material used hence the required volume<sup>7</sup>.

In the past, surgical techniques dominated the field of facial rejuvenation. However, the importance of a three-dimensional volume restoration using dermal fillers has become increasingly recognized in recent years and has increasingly gained precedence over a two-dimensional lift by the scalpel<sup>8</sup>.

## HA dermal fillers

Hyaluronic acid is very hydrophilic, therefore a change in the treated region after injection is expected. That makes the substance perfect for a more superficial correction. It also hydrates the skin, so that wrinkled skin is better glazed<sup>9</sup>. However, to correct for bone resorption at depth, a substance with less hydrophilic property is needed.

## Anatomical changes of the face in old age

No part of the human organism reflects aging like the facial area. The face consists of skin, subcutaneous fat, muscle and bone structure. These individual components age independently, they have their own laws of aging.

In old age, not only changes in the surface of the skin are noted. Aging processes also occur in various deep

structures of the human face especially in the area of the maxillary and mandibular; most notably fat loss and bone resorption. Striking is the sinking of soft tissue such as eyebrows and cheeks. Nasal manifestations of the nose result from degradation of the bony and cartilaginous framework. Therefore, the sinking of the tip of the nose and a shortening of the columella arise. Through this downward movement, the nose appears longer and larger. The nose is now larger and the nasolabial angle can be sharpened. In addition, the elderly patient usually has excessively inelastic skin, which makes an injection more difficult.

However, there are differences, especially depending on race, genetic factors and individual aspects (some earlier, later)<sup>10</sup>.

## Upper third of the face

The upper third of the face consists mainly of the forehead. Here, dominates the glabella and horizontal folds. These are usually dynamic wrinkles. Here, a treatment with botulinum toxin is recommended.

## Middle face third

Therapeutically significant is the midface, especially with respect to the following changes e.g. slackening, sinking of the cheek fat, reduction of hypodermic fat, strengthening nasolabial folds, slackening of the lower eyelids with optical extension.

In addition, there is an aging of the nose (extension of the nose, rarification of the nasal skeleton, loss of hypodermic fat in the nasal area, broadening of the nose and convex nose bridge).

Overall, the midface in old age tends to change to hollow-cheeked, flat, empty, and narrow<sup>10,11</sup>.

## The aging nose (as part of the middle face)

The nose as the central area in the middle face of the human being is one of the first visible structures for the opposite and the mirror image. It is a complex, three-dimensional, trapezoidal organ protruding from the face. Due to its three-dimensionality, however, the nose causes many people an increased aesthetic distress<sup>12</sup>.

While wrinkles are often only perceived as two-dimensional disturbing strokes, the cosmetic problems and desires of the patients with regard to the appearance of the nose are much more complex. Surgical rhinoplasty is therefore one of the most common aesthetic surgical procedures. As with all surgical interventions, there is a certain amount of rhinoplasty

risk of complications with corresponding convalescence time and downtime. In addition, the operation is associated with high costs. Increasingly, therefore, many patients develop the desire to avoid surgical intervention. Still, most have never heard of a nonsurgical nose job<sup>13-15</sup>.

## Lower third of the face

The lower third of the face extends from the subnasal area to the chin seat. Displacement of the cheek fat caudally. This also applies to the mimic muscles, the zygomatic muscle, major and minor, and the m. risorius. Bone atrophy of the maxilla in anterior-posterior direction and congenital low-grade retrognathia. Due to the sinking cheek fat, the impression of a deepened

nasolabial fold is intensified. By increasing the cheek fat above the nasolabial fold this impression is emphasized.

### Agarose gel as dermal filler

The cutaneous and subcutaneous shrinkage of fat or bone resorption can be temporarily compensated by appropriate injections of collagen, autologous fat, hyaluronic acid or even agarose gel<sup>6,16,17</sup>.

Agarose is in principle not a completely new material in medicine. It has been used in the dental field for more than ten years<sup>6</sup>. The substance class is a polysaccharide of D-galactose and 3,6-anhydro L-galactose, which are glycosidically linked. Thus it represents a main component of the agar<sup>7</sup>. 100% based on natural polysaccharides, it is completely biocompatible and thus degradable. Agarose gel is a sterile, biodegradable, viscoelastic, isotonic, transparent injectable gel implant<sup>16,18</sup>.

Agarose is broken down in the human organism. For this purpose, agarose is first transported by the action of macrophages from the site of application and then degraded enzymatically by means of galactosidase. Agarose is metabolized in the pentose cycle at macrophage, platelet and endothelial reticulum levels<sup>6,16</sup>.

Because of its biocompatibility, agarose is widely used in clinical trials. Therefore, the substrate is used in biocompatible tests, for example with regard to cytotoxicity, genotoxicity<sup>19</sup>, mutagenesis<sup>20</sup>, sensitivity<sup>21</sup>, and subcutaneous implants<sup>22</sup>.

In addition, the gel is used in biotechnology for three-dimensional tissue growth and as a controlled release substrate for pharmacological substances.

### Application of agarose gel

For the preparation of the treatment a superficial anesthesia with a topical anesthetic is recommended. In some cases, a local anesthetic injection should also be considered. Treatment should be as painless as possible. In addition to topical anesthesia, the use of very thin cannulas also serves this purpose. It can also be mixed local anesthetic with the gel. Agarose itself is because of its isotonic properties, as mentioned above, an almost painless injectable. The injection should be done very slowly. Only when stretching out of the tissue does it burn. It is essential to have an extended massage of the injected area to disperse the imported substance with the surrounding tissue. Agarose gel transforms into a hydrocolloid after injection into the tissue. This creates a natural and harmonious look. According to the principle "What you see is what you get", the result visible immediately after the injection is also the final result. An additional advantage is the use in patients who have demonstrated intolerances to hyaluronic acid or other ingredients in previous treatments.

### Material and Methods

In our practical everyday life we inject a variety of facial areas. The agarose gel used in this study contained 2.5% agarose and 97.5% saline solution for nasolabial fold (Figure. 1) and 3.5% agarose and 96.5% saline solution for rhinoplasty and jaw angle (Figure. 2 & 3). Patients with acute or chronic skin pathologies or direct

involvement in or around the area to be treated were excluded. Pregnancy, lactation and hyaluronic acid treatment less than 3 months earlier were also excluded criteria. After discussing patient in-depth information and written consent, discussing the risks and benefits of the procedure, the risks and benefits of alternatives, and answering all questions, the written consent form outlined possible complications such as bruising, swelling and hematoma or pain. To reduce bruising, patients were asked not to take salicylates in the last 2 weeks before treatment.

In total 27 patients were treated (14 non-surgical nose jobs, four augmentation of jaw angle and nine nasolabial folds). The patients were between 32 and 68 years old. All patients were female. Nobody had a treatment with permanent fillers before. 5 previously had an injection with hyaluronic acid in the area of the nasolabial fold.

For a better comfort, a superficial anesthetic cream was applied. The agarose was mixed with 0.1 mL of lidocaine 0.1% to be as painless as possible during the injection. For the injection of the nose and nasolabial fold 30 gauge needles should be used with a length of 13 mm, for the jaw angle 27 gauge needles. The esthetic evaluation was done after 14 days, and 1, 3 and 6 months after the injection. While a volume of 1.4 mL agarose gel 2.5% was sufficient for the nasolabial fold (Figure. 1), 2.8 mL were necessary for the jaw angle of agarose gel 3.5% (Figure. 2). However, for the rhinoplasty, only 0.3 mL of 3.5% agarose gel was sufficient (Figure. 3). Direct finger compression with cotton gauze and mild cooling were used to reduce bruising and swelling. Further, no special instructions were required and the patients immediately returned to work. The only adverse events described were hematoma, redness, bruising and swelling. All adverse events lasted for a maximum of 4 days.

Patients were asked to re-present 14 days and one month after injection for follow-up and possible reinjection to correct for asymmetry or lack of desired fullness. These repairs were usually made after 14 or 30 days, with 0.1 mL agarose in the area of the nose (by only three patients), 0.2-0.3 mL at the nasolabial folds (six patients), and a maximum of 0.4 mL at the jaw angle area (two patients). Such improvements were not necessary in these three patients (see below in Figures 1-3). Therefore, we asked for an additional follow-up after 3 and 6 months. All results remained after 6 months.



Figure 1 - Left before Injection. Right immediately after injection with 1.4 ml agarose gel 2,5% nasolabial fold and marionette-fold.



*Figure 2 - Left before Injection. Right after injection with 2.8 mL agarose gel 3,5% jaw angle.*



*Figure 3 - Left before Injection. Right immediately after injection with 0.3 mL agarose gel 3,5% non-surgical rhinoplasty.*

### Conclusion

The agarose-based filler is a great new option for modeling and aesthetic correction in nonsurgical rhinoplasty and complete face treatment.

Especially for patients who want to avoid surgery. But even for the practitioner, it offers a low-complication possibility of a nose correction with relatively little effort compared to an operative procedure. So far we have had several very good substances (such as hyaluron and calcium hydroxyapatite) available. Now, with agarose gel, another substance enriches the dermal filler range with an interesting option. This popularity of a substance such as agarose will continue to increase in the future as the aging population seeks viable options to correct the signs of aging without surgery. The utilization of these fillers by trained professionals provides an effective and safe therapy for the management of the aging face.

### Disclosure

The authors declare that they have no conflicts of interest and have not received any contributions for this publication.



## REFERENCES

1. Park KY, Kim HK, Kim BJ. Comparative study of hyaluronic acid fillers by in vitro and in vivo testing. *J Eur Acad Dermatol Venereol*. 2014; 28(5): 565-8.
2. Cohen JL. Understanding, avoiding, and managing dermal filler complications. *Dermatol Surg*. 2008; 34 Suppl 1:S92-9.
3. Coleman SR, Grover R. The anatomy of the aging face: volume loss and changes in 3-dimensional topography. *Aesthetic Surg J*. 2006; 26(1S):S4-9.
4. Small R, Dalano H (2012): A Practical Guide to Dermal Filler Procedures. Philadelphia. 2012.
5. Cohen JL. Understanding, avoiding, and managing dermal filler complications. *Dermatol Surg*. 2008; 34 Suppl 1:S92-9.
6. Scarano A. Ringiovanimento dei tessuti molli periorali con agarose gel. *Dent Clin*. 2009; 2:5-13.
7. Raspaldo H, Gassia V, Niforos FR, Michaud T. Global, 3-dimensional approach to natural rejuvenation: part 1 - recommendations for volume restoration and the periorcular area. *J Cosmet Dermatol*. 2012; 11(4):279-89.
8. de Maio M. The minimal approach: an innovation on facial cosmetic procedure. *Aesthetic Plast Surg*. 2004; 28(5):295-300.
9. Papakonstantinou E, Roth M, Karakiulakis G. Hyaluronic acid: A key molecule in skin aging. *Dermatoendocrinol*. 2012; 4(3):253-258.
10. Pessa JE. An algorithm of facial aging: verification of Lambros's theory by three-dimensional stereolithography, with reference to the pathogenesis of midfacial aging, scleral show, and the lateral suborbital trough deformity. *Plast Reconstruct Surg*. 2000; 106(2):479-88; discussion 489-90.
11. Funk W. Das alternde Gesicht III - von Heimburg, Lemperle - Ästhetische Chirurgie - 2. Erg. Lfg. 6:1999.
12. Cohen S. Minimally Invasive Approach for Rhinoplasty. Rhinoplasty, book edited by Michael J. Brenner, ISBN 978-953-307-849-6, Published: December 9, 2011 under CC BY 3.0 license. © The Author(s). DOI: 10.5772/29942.
13. Shab A. Die nichtchirurgische Nasenkorrektur. *Face*. 2016; 4:12-17.
14. Rivkin AZ. Non Surgical Rhinoplasty, Chapter 14; Minimally Invasive Techniques in Rhinoplasty, 2014.
15. Romo T 3rd, Solimanzadeh P, Litner JA, Sclafani AP. Rhinoplasty in the aging nose. *Facial Plast Surg*. 2003; 19(4):309-15.
16. Scarano A, Carinci F, Piattelli A. Lip augmentation with a new filler (agarose gel): a 3-year follow-up study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2009; 108(2):e11-5.
17. Shab A. Lippenaugmentation mit der neuen Füllergeneration Agarose-Gel. *Face*. 2016; 2:17-18.
18. Shab A. Algeness® - die neue Generation von Füllern aus Agarose: Kosmetische Medizin: 2016; 3:88-92.
19. Cho YS, Hong ST, Choi KH, Chang YH, Chung AS. Chemopreventive activity of porphyrin derivatives against 6-sulfoxym-ethylbenzo[a]pyrene mutagenicity. *Asian Pac J Cancer Prev*. 2000; 1:311-7.
20. Marczylo T, Arimoto-Kobayashi S, Hayatsu H. Protection against Trp-P-2 mutagenicity by purpurin: mechanism of in vitro antimutagenesis. *Mutagenesis*. 2000; 15(3):223-8.
21. Naziruddin B, Durriya S, Phelan D, et al. HLA antibodies present in the sera of sensitized patients awaiting renal transplant are also reactive to swine leukocyte antigens. *Transplantation*. 1998; 66(8):1074-80.
22. Gu Y, Tabata Y, Kawakami Y, et al. Development of a new method to induce angiogenesis at subcutaneous site of streptozotocin-induced diabetic rats for islet transplantation. *Cell Transplant*. 2001; 10(4-5):453-7.

# Hyperdiluted PLLA for inner arm skin tightening. Personal experience

Emanuele Bartoletti<sup>1</sup>, Loredana Cavalieri<sup>2</sup>

<sup>1</sup>MD, Plastic Surgeon, President of Italian Society of Aesthetic Medicine, Director of Aesthetic Medicine Service of FBF Hospital, Rome  
Medical Office, Via Monte Zebio, 28 00166 Rome - Italy

<sup>2</sup>MD, Plastic Surgeon, Plastic Surgery Unit San Camillo Forlanini Hospital, Rome

## Abstract

**Background:** Poly-lactic acid (PLLA) is used since long time to achieve the indirect volume augmentation of soft tissues. This substance was approved in Europe in 1999 and in 2004 FDA has also approved the use of this substance in the treatment of facial lipoatrophy in HIV-positive patients. In 2009 FDA has also approved the use of this substance in the treatment of facial wrinkles in Aesthetic Medicine. Poly-lactic acid has an indirect effect: the volume augmentation is not due to the space occupied by the substance. It is due to the local reaction caused by poly-lactic acid and subsequent collagen production by fibroblasts. It is a completely resorbable filler. It decomposes into H<sub>2</sub>O and CO<sub>2</sub> in a year. Some publications show that the stimulation in collagen production could help in the treatment of skin laxity in inner arm region, above all in post menopause women.

**Objective:** Authors will show their experience in the treatment of skin laxity in inner arm region with superficial infiltration of hyper-diluted poly-lactic acid.

**Methods & Materials:** 30 female patients were treated, aged between 37 and 64 years old. Dismorfism was classified according to Eric A. Appelt and staff new classification system. Poly-lactic acid was diluted with 9cc of sterile distilled water plus 1cc of lidocaine 20mg/10ml 12 hours before treatment. The area of the arms was infiltrated with 1 fl of poly-lactic acid for a total of 10 cc of solution per side. The PLLA was injected into the deep dermis, in retrograde direction, in opposite and intersecting fan micropunctures, using 2.5 cc for each injection and a vigorous massage was performed after each infiltration.

**Results:** The Result was defined by the patients through a visual assessment of the photographs based on criteria of skin colour, presence of wrinkles, shape and volume. In order to provide objective validation of the result, we performed patients' satisfaction test with the help of photographs as well as ultrasound examination. After the third application (from 12 to 24 weeks), one was able to observe an improvement in the treated area with good and very good results in groups IIa and IIb and unexpected results from very good to excellent in type IIIa patients at T120.

**Conclusion:** The skin of the medial region of the arms is extremely thin and delicate, which is why filler hyper-dilution has been employed, associated to vigorous massage which has led to brilliant results where the right therapeutic indication has been considered.

## Keywords

Poly-lactic acid (PLLA), skin laxity, arm contouring, hyper-dilution

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

Emanuele Bartoletti, MD

Phone: +39 3356893698

E-mail: [ebartoletti@lamedicinaestetica.it](mailto:ebartoletti@lamedicinaestetica.it)

Address: Medical Office, Via Monte Zebio, 28 00166 Rome - Italy

**Introduction**

The upper third region of the arms is the one most subject to the modifications arising from weight loss and skin ageing processes: particularly the skin of the medial arm region, which is described by Avelar as the thinnest and most delicate of the whole body<sup>3</sup>. Glanz and Gonzales-Ulloa have shown that, with age, the lower curvature of the arms' soft tissues increases and there is a loss of connective support structures with consequent onset of increasingly worsening ptosis up to the occurrence of what is referred to as the "bat wings" deformity<sup>8</sup>. From the histological point of view the skin of this region features skin about 0.1mm thick, whose appearance is always sinuous and, in some cases, with scarce papillae. The collagen of young skin is dense and even in the papillary dermis, arranged in parallel bands in the reticular dermis. In aged skin collagen decreases and its appearance is heterogeneous and disordered<sup>16</sup>. Although the corrective approach to arm imperfections is very often surgical and depends on the severity of the dysmorphic feature that mainly affects the skin and the subcutaneous adipose component, many patients reject the procedure and seek less invasive methods<sup>3,4</sup>.

A number of aesthetic medicine techniques have been employed in recent years, including fillers, in order to restore volume to the arm contour and improve the signs of skin ageing in this region. Among the contemplated fillers, the rationale for using poly lactic acid especially lies with its stimulating action for the production of dermal neocollagen<sup>5,6</sup>. The use of poly lactic acid has gained extensive recognition and commendations: in 1999 in Europe for the correction of scars and wrinkles, in 2004 the FDA approved for treatment of HIV-related lipoatrophy and in 2009 for filling nasolabial folds for aesthetic purposes<sup>20,21,23</sup>. Poly lactic acid (PLLA) belongs to the family of alpha hydroxy acids, is biodegradable and bio-compatible. The injection form consists of a biodegradable synthetic polymer consisting of PLLA micro-particles and associated to sodium carboxymethyl cellulose and apyrogenic mannitol, the latter having an emulsifying effect increasing the moisturising effect of

carboxymethyl cellulose. After injecting, poly lactic acid is hydrolysed into lactic acid monomers, which induce a local inflammatory response by drawing in monocytes, macrophages and fibroblasts. After fibroblasts appear, neocollagenesis occurs of type I and type III collagen fibres with thickening of the dermis<sup>12,15,18</sup>. For the aim of seeking the best corrective approach for this anatomical region, a number of classification systems regarding its aesthetic modifications have been described. The exact therapeutic indication is therefore related to the degree of dysmorphism of this anatomical region<sup>7</sup>.

Specifically, Eric A. Appelt and staff put forth a new classification system - modifying the one described by Rohrich and Kenkel - entailing seven clinical groups and taking into account the degree of cutaneous excess relating to ptosis, the amount of fat in the subcutaneous tissue and their anatomical distribution area (*Table 1*)<sup>2,17</sup>. Classification according to Rohrich R.J., Kenkel J.M.: "Back and arms". In "Ultrasound-assisted liposuction", 1st Ed. St. Louis, Mo: Quality Medical Publishing, 1998. Pp 231-252. Modified by Appelt et al. in "An algorithmic approach to upper arm contouring. *Plast Reconstr Surg.* 2006; 118(1):237-46. Taking into account this classification and some patients' wish not to undergo surgery, we have selected the cases to be treated with PLLA infiltration. The results obtained were assessed with photos and ultrasound examination with 22 MHZ transducer.

**Materials and Methods**

From January 2015 to December 2016, 30 patients were treated, aged between 37 and 64 years old (average age: 48.43). Treatment was carried out on: 12 type IIa, 10 type IIb and 8 type IIIa patients (*Table 2a*). The patients were all female, average age 48.4 but with high variability (9 years), due to the fact that, apart from a peak around the age of 40, patients are almost evenly distributed between 40 and 65 years of age. No significant age differences are observed among classes IIa, IIb and IIIc (p=0.598, NS) *Table 2b*. The following exclusion criteria

Type	Skin Excess	Fat Excess	Location of Skin Excess
I	Minimal	Moderate	n/a
II a	Moderate	Minimal	Proximal
II b	Moderate	Minimal	Entire arm
II c	Moderate	Minimal	Arm and chest
III a	Moderate	Moderate	Proximal
III b	Moderate	Moderate	Entire arm
III c	Moderate	Moderate	Arm and chest

*Table 1 - New classification System.*

n/a, not applicable

Class	Number	Mean	Std. Deviation
II a	12	47.75	8.379
II b	10	50.80	9.601
III a	8	46.50	10.365
Total	30	48.43	9.183

Table 2a - Patient distribution according to the new classification system of arm disfigurement.

were considered: pregnancy; breastfeeding; a history of allergy with episodes of anaphylactic reactions and/or hypersensitivity to local anaesthetics, latex and silicon; coagulation disorders; cardiological and metabolic diseases; keloid diathesis<sup>9</sup>. Polylactic acid was diluted with 9cc of sterile distilled water plus 1cc of lidocaine 20mg/10ml 12 hours before treatment<sup>12</sup>. The area of the arms to be treated was identified with the patients' arms hanging down naturally. The medial area of the arms was considered from the axillary column to the medial condyle of the humerus. Each area was infiltrated with 1 fl of polylactic acid for a total of 10 cc of solution per side. A 25G x 15 cm spinal needle was used for the infiltration. The PLLA was injected into the deep dermis, in retrograde direction, in opposite and intersecting fan micropunctures, using 2.5 cc for each injection (See video online). The patients signed an informed treatment consent form. Three treatments were performed, with thirty-day intervals: T30, T60, T905. Vigorous massage was performed after each infiltration. Patients were then prescribed to massage the treated areas five times a day for five minutes for the five days following infiltration<sup>6</sup>. Photos were taken of the patients, and ultrasound examination with 22 MHZ transducer was carried out at: T0, T30 (4 weeks), T60 (8 weeks), T90 (12 weeks) and T120 (16 weeks). The patients were asked to view the

photographs at T30, T60 and T120 and to assess the result according to the Global Aesthetic Improvement Scale (Gais), in an assessment scale taking into consideration five categories (poor; absent; good; very good; excellent) on the basis of some features such as: colour changes of the skin surface, the presence of wrinkles, the shape of the arm contour and the subcutaneous volume change (Table 3).

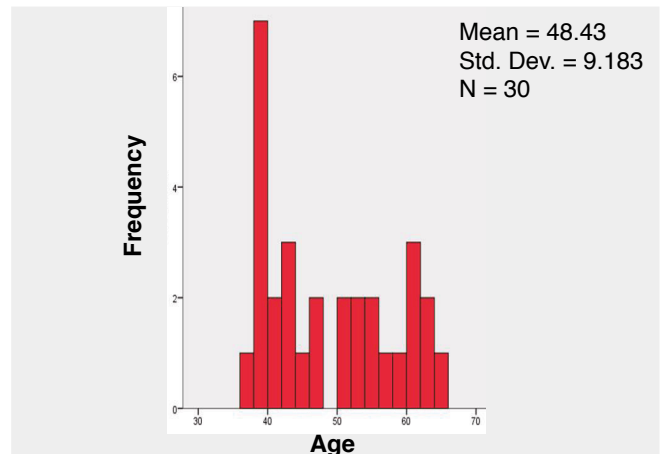


Table 2b - Diagram of patient distribution according to age, average age of patients and standard deviation.

Score	Result	Description
1	Poor	Worsening with respect to the starting conditions (presence of lumps)
2	Absent	No evident change with respect to the initial conditions
3	Good	There is an improvement with respect to the initial conditions but further treatment is required
4	Very good	Further improvement with satisfactory results
5	Excellent	Excellent result consistent with the patient's expectations

Table 3 - The Result was defined by the patients through a visual assessment of the photographs based on criteria of skin colour, presence of wrinkles, shape and volume.

**Results**

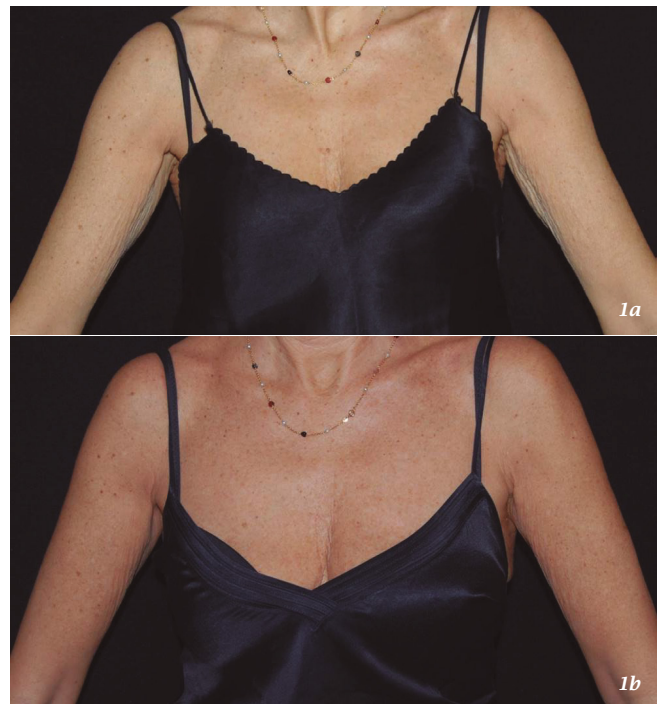
After the first session (T30: four weeks) it was not possible to observe any improvement upon clinical examination, except a slight improvement of the skin texture, while the sonogram already showed a slight thickening of the deep dermis.

After the second treatment (T60: eight weeks), both the patients and the operator observed an improvement of the cutaneous surface with greater superficial tension and brighter colour, especially in the type IIa and IIb group of patients (Figures 1a,1b and Figures 2a, 2b).

With the third application (from 12 to 24 weeks), one was able to observe an improvement in the treated area with good and very good results in groups IIa and IIb and unexpected results from very good to excellent in type IIIa patients at T120 (Table 4, Figures 3a, 3b, 3c and Figures 4a, 4b).

As regards the ultrasound analysis of the treated areas, it was possible to observe greater thickening and greater echogenicity at deep dermis level already from time T30. Echogenicity and thickness continued increasing slowly and progressively up to time T120, although it was not possible to assess the numerical extent (Figures 5a, 5b and Figures 6a, 6b).

No clinically significant adverse events occurred. 20 cases presented with widespread ecchymosis after treatment and 8 cases experienced pain in the injection area.



Figures 1a and 1b - Pretreatment view of a 52-years-old and a 40 female type IIa.

Patients	Class	T30	T60	T90	T120	Age	Sex
Pz 1	II a	2	3	3	4	38	F
Pz 2	II a	2	3	4	4	42	F
Pz 3	II a	2	3	3	4	47	F
Pz 4	II a	2	3	3	4	51	F
Pz 5	II a	2	3	4	4	55	F
Pz 6	II a	2	2	4	4	60	F
Pz 7	II a	2	3	3	5	39	F
Pz 8	II a	2	3	4	4	61	F
Pz 9	II a	2	3	4	4	52	F
Pz 10	II a	2	3	4	3	38	F
Pz 11	II a	2	3	4	4	40	F
Pz 12	II a	2	3	3	5	50	F
Pz 13	II b	2	2	4	4	58	F
Pz 14	II b	2	3	4	4	47	F
Pz 15	II b	2	2	4	4	39	F
Pz 16	II b	2	3	4	4	60	F
Pz 17	II b	2	3	3	5	63	F
Pz 18	II b	2	3	3	4	53	F
Pz 19	II b	2	3	4	4	55	F
Pz 20	II b	2	3	4	4	57	F
Pz 21	II b	2	2	3	4	37	F
Pz 22	II b	2	3	4	4	39	F
Pz 23	III a	2	2	3	5	42	F
Pz 24	III a	2	3	4	4	41	F
Pz 25	III a	2	2	3	5	62	F
Pz 26	III a	2	2	3	5	39	F
Pz 27	III a	2	3	4	4	38	F
Pz 28	III a	2	2	4	5	42	F
Pz 29	III a	2	2	4	5	44	F
Pz 30	III a	2	2	4	5	64	F

Table 4 - Patients assessment score based on their classification, after poly-lactic acid infiltration, at 4 (T30), 8 (T60) and 12 weeks (T90) from treatments. Excellent results were obtained especially in class IIIa patients.



Figures 2a and 2b - Post-treatment view after eight weeks, both the patients and the operator observed an improvement of the cutaneous surface with greater superficial tension and brighter colour.

When comparing progress among the initial classes, a significant difference is observed between the initially most severe group (IIIa) and the others. The difference is due to the fact that at first intermediate assessment (T60) the score improvement in group IIIa is lower than the other two classes (p=0.006), at the second intermediate assessment group IIIa achieves a good level of satisfaction by the patients, with no difference from the other groups

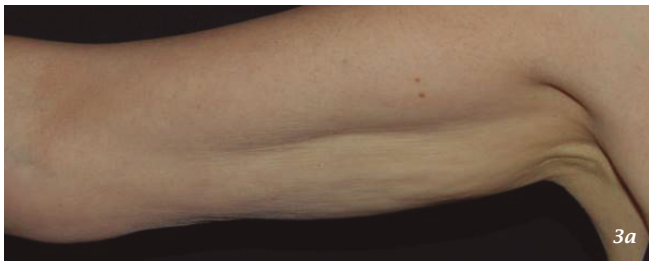


Figure 3a - Pretreatment view of a 39-years-old female type IIa.

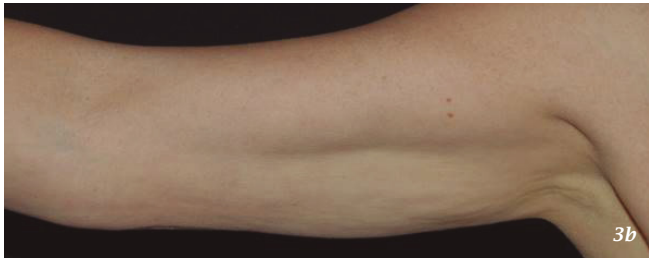


Figure 3b - 12 weeks after PLLA treatment.

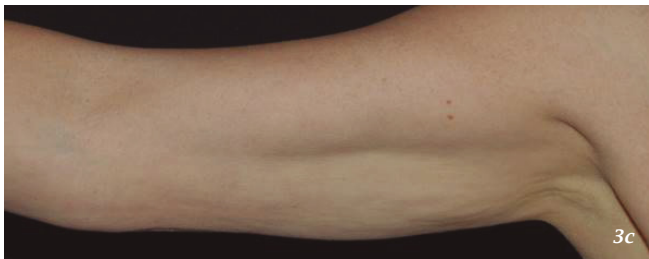
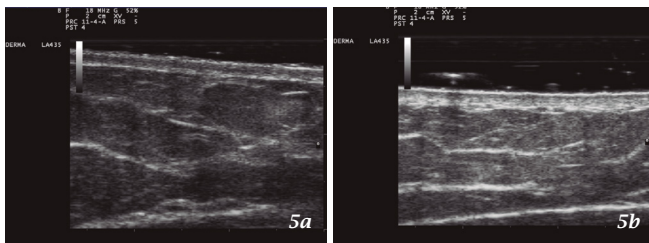


Figure 3c - Results 24 weeks following PLLA treatment, the skin shows good results.



Figures 5a - 5b - Ultrasound analysis of the inner area of the arm before treatment with PLLA.

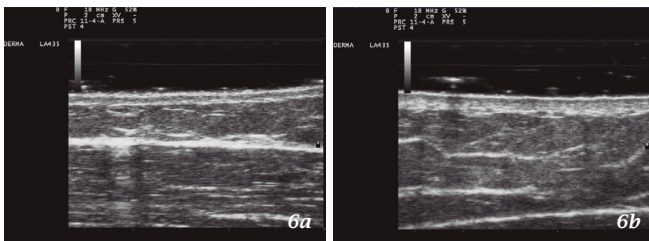


Figure 6a - Thickness and echogenicity at dermis level is increasing from time T30.

Figure 6b - Echogenicity and thickness continued increasing slowly and progressively up to time T120, although it was not possible to assess the numerical extent.

( $p=0.896$ ) and at final assessment group IIIa reports an even higher level of satisfaction ( $p=0.003$ ), achieving a very high level (4.6, considering that 5 corresponds to the statement "Excellent result consistent with the patient's expectations"), while the other two groups on average stop at a lower level (3.6) (Tables 5, 6).

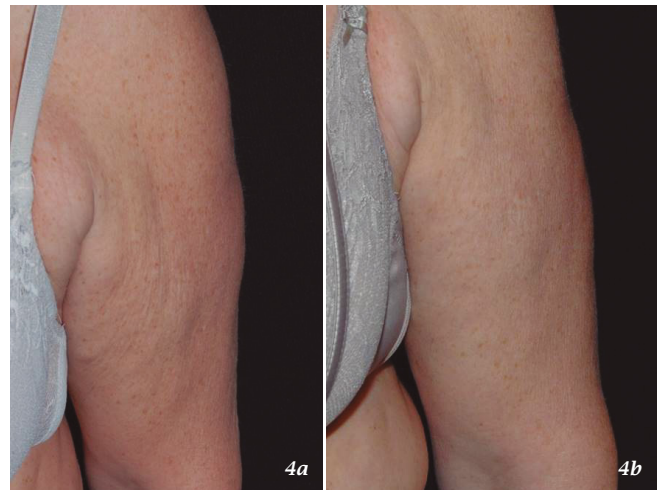


Figure 4a - Pretreatment view of a 64-years-old female type IIa  
Figure 4b - Excellent and unexpected result after 24 weeks of follow-up and three treatment of PLLA.

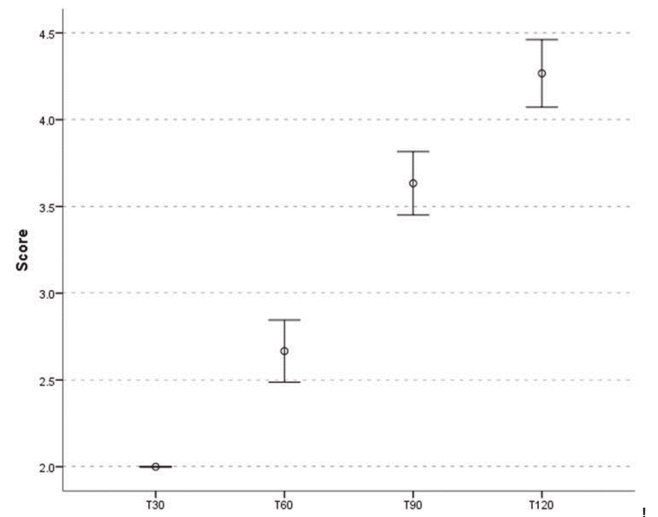


Table 5 - Patients assessment score, improvement over time appears very significant ( $p<0.001$ ).

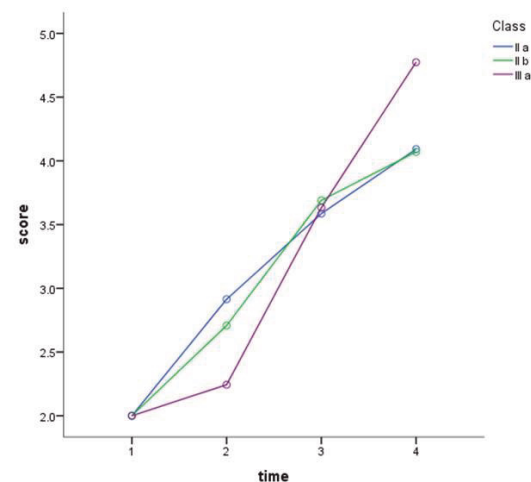


Table 6 - Covariates appearing in the model are evaluated at the following values: Age = 48.43

## Discussion

Although treatment of the dysmorphism and skin ageing of the arms is often surgical, for those patients who do not wish to undergo surgery, and in whom the aesthetic changes are not excessively significant, an aesthetic medical approach may be taken into consideration in order to improve the clinical situation. The use of poly lactic acid has been recently put forth in order to address the loss of skin density and thickness due to ageing processes<sup>3,4</sup>.

The dermis thickening action of this filler has been proven in the literature, thanks to its ability to trigger a local inflammatory response that results in neocollagenesis<sup>11,14,15</sup>.

Through histological observations on biopsies, Lemperle and staff have observed the presence of a thin extracellular matrix around the hydrolysed PLLA microspheres and infiltrate of macrophages and lymphocytes already three months after the poly lactic acid infiltration. Six months later, biopsy examinations have shown the persistence of macrophages and giant cells around the PLLA microspheres, whereas nine months later there was no longer any trace, signifying complete degradation of the injected product and neocollagenesis in the dermis. Vle-gaar and Bauer have conducted biopsies in a 55-year-old patient treated with PLLA infiltration to correct the nasolabial folds, showing collagen thickening after 30 months<sup>7,13,24</sup>.

Philip Stein et al. report that the increase in thickness induced by PLLA is due to the formation of the capsule induced by macrophages, myofibroblasts and neo-formation of type I and II collagen fibres<sup>22</sup>.

With regards to dilution, in our experience we have employed 10cc hyper-dilution, 9 cc of which of sterile distilled water and 1 cc of 20mg/10ml lidocaine, in order to obtain a more fluid, hence easier to handle solution that would spread more easily. This dilution has allowed us to prevent the possible formation of subcutaneous lumps that often represent a complication for this filler and which might have occurred easily in this anatomical area, also in connection to the thinness of the skin<sup>19</sup>.

In order to prevent possible complications, for each infiltration, 10ml of PLLA were injected per side into the deep dermis (preferable) or subcutaneously and vigorous massage was performed on the whole area, followed by massage at home according to the 5-5-5 scheme<sup>21</sup>.

In order to provide objective validation of the result, we performed patients' satisfaction test with the help of photographs as well as ultrasound examination.

The latter showed a thickening effect, although minimal, of the deep dermis, especially in the cases where clinical improvement was most conspicuous, particularly in type IIIa patients.

Specifically, these patients had a better represented subcutaneous adipose tissue compared to the other two classes considered. This likely further affected the patients' opinion of an improvement. However, the problem of the control group remains, as it was not carried out and would have further validated the results of personal experience.

Our experience did not point to complications. Side effects such as stinging and pain were reported, which spontaneously subsided in few hours and benefited from the vigorous massage.

## Conclusion

Treatment of ageing in the medial region of the arms may represent a challenge for the aesthetic doctor, especially in patients who reject surgery. Among the various methods, the use of fillers has a rationale due to their stimulating effect for collagen production and thickening of the deep dermis.

Poly lactic acid has recently been approved by the FDA for aesthetic use, particularly for correcting the nasolabial folds.

In view of its ease of handling and scarcity of side effects, when used properly, it has started being used off-label in other body regions as well<sup>1,10</sup>.

The skin of the medial region of the arms is extremely thin and delicate, which is why filler hyper-dilution has been employed, associated to vigorous massage which has led to brilliant results where the right therapeutic indication has been considered.

## Disclosure

The authors declare that they have no conflicts of interest and have not received any contributions for this publication.

## REFERENCES

1. Alam M, Dover JS. Management of Complications and Sequelae with Temporary Injectable Fillers. *Plast Reconstr Surg.* 2007; 120 (6 Suppl):98S-105S.
2. Appelt EA, Janis JE, Rohrich RJ. An Algorithmic Approach to Upper Arm Contouring. *Plast Reconstr Surg.* 2006; 118(1):237-46.
3. Avelar J. Study of the anatomy of the subcutaneous adipous tissue applied for fat suction technique. In: Trans IX Intern. Congr. Plast. Surg. Mc Graw-Hill: New Delhi, P.337, 1987.
4. Avelar J, Illouz YG. Lipoaspiracao. Hipòcrates: Sao Paulo, 1986.
5. Bauer U, Graivier MH. Optimizing injectable poly-L-lactic acid administration for soft tissue augmentation: The rationale for three treatment sessions. *Can J Plast Surg.* 2011; 19(3):e22-7.
6. Dal'Asta Coimbra D, Gutstein da Fonseca Amorim A. Poly-L-lactic acid in the rejuvenation of the medial and anterior arms. *Surg Cosmet Dermatol.* 2012; 4(2):182-5.
7. El Khatib HA. Classification of brachial ptosis: strategy for treatment. *Plast Reconstr Surg.* 2007; 119(4):1337-42.
8. Glanz S, Gonzalez-Ulloa M. Aesthetic surgery of the arm: Part 1. *Aesthetic Plast Surg.* 2004; 113:1044.
9. Goldberg D, Guana A, Volk A, Daro-Kaftan E. Single-arm study for the characterization of human tissue response to injectable poly-l-lactic acid. *Dermatol Surg.* 2013; 39(6):915-922.
10. Goodman GJ, Roberts S, Callan P. Experience and Management of Intravascular Injection with Facial Fillers: Results of a Multinational Survey of Experienced Injectors. *Aesthetic Plast Surg.* 2016; 40(4):549-555.
11. Hart DR, Fabi SG, White WM, Fitzgerald R, Goldman MP. Current Concepts in the Use of PLLA: Clinical Synergy Noted with Combined Use of Microfocused Ultrasound and Poly-L-Lactic Acid on the Face, Neck, and Décolletage. *Plast Reconstr Surg.* 2015; 136(5Suppl):180S-187S.
12. Lam SM, Azzizadeh B, Graivier M. Injectable Poly-L-lactic acid (Sculptra): technical considerations in soft-tissue contouring. *Plast Reconstr Surg.* 2006; 118(3Suppl):55S-63S.
13. Lamperle G, Morhenn V, Charrier U. Human histology and persistence of various injectable filler substances for soft tissue augmentation. *Aesthetic Plast Surg.* 2003; 27(5):354-367 367 o 366?
14. Lorenc ZP. Techniques for the optimization of facial and nonfacial volumization with injectable poly-l-lactic acid. *Aesthetic Plast Surg.* 2012; 36(5):1222-1229.
15. Moy RL, Fincher EF. Poly-L-lactic acid for the aesthetic correction of facial volume loss. *Aesthetic Surg J.* 2005; 25(6):646-648.
16. Da Rocha RP, Sementilli A, Blanco A, Fernandes AF, Tonetti RL. The skin of the medial area of the arm: morphometric study of interest to liposuction. *Aesthetic Plast Surg.* 2001; 25(6):468-473.
17. Rohrich RJ, Kenkel JM. Back and arms. In "Ultrasound-assisted liposuction", 1st Ed. St. Louis, Mo: Quality Medical Publishing, 1998. Pp 231-252.
18. Redaelli A, Forte F. Cosmetic use of poly-lactic acid: report of 568 patients. *J Cosmet Dermatol.* 2009; 8(4):239-248.
19. Rossner F, Rossner M, Hartmann V, Erdmann R, Wiest LG, Rzany B. Decrease of reported adverse events to injectable poly-lactic acid after recommending an increased dilution: 8-year results from the Injectable Filler Safety study. *J Cosmet Dermatol.* 2009; 8(1):14-18.
20. Sadove R. Injectable Poly-L-lactic acid: a novel sculpting agent for the treatment of dermal fat atrophy after severe acne. *Aesthetic Plast Surg.* 2009; 33(1):113-116.
21. Schierle CF, Casas LA. Nonsurgical rejuvenation of the aging face with injectable poly-l-lactic acid for restoration of soft tissue volume. *Aesthetic Surg J.* 2011; 31(1):95-109.
22. Stein P, Vitavska O, Kind P, Hoppe W, Wieczorek H. The biological basis for poly-l-lactic acid-induced augmentation. *J Dermatol Sci.* 2015; 78(1):26-33.
23. Valantina MA, Aubron-Oliviera C, Ghosna J, et al. Poly-lactic acid implants (New-Fill) to correct facial lipoatrophy in HIV-infected patients: results of the openlabel study VEGA. *AIDS.* 2003, 17:2471-2477.
24. Vleggar D, Bauer U. Facial enhancement and the European experience with Sculptra (poly-l-lactic acid). *J Drugs Dermatol.* 2004; 3(5):542-7.



---

Original Article

# Palpebral Skin Bio-Restructuring

Luca Piovano<sup>1</sup>, Alberto Liberti<sup>2</sup>, Valentina Sorvillo<sup>3</sup>

<sup>1</sup>MD, Plastic Surgeon - Professor at University of Camerino and Turin

<sup>2</sup>MD, Aesthetic Doctor - Freelance

<sup>3</sup>MD, Plastic Surgeon - Freelance

---

## Abstract

Restructuring treatment to reverse aging of the periorbital region is one of the challenges faced by plastic surgeons. Although there is no single treatment for different skin types, it is nonetheless important to evaluate which treatments are most suitable. Our study compares amino acids injection treatments with treatments combining percutaneously injected dermaroller and amino acids. We considered parameters like patient's discomfort during treatment and post-treatment satisfaction. Such data were analyzed with the Students' t-test. Infiltration with amino acids proved to be more effective in the long term than the combined approach.

## Keywords

Eyelid, aging, mechanical stimulus, chemical stimulus

---

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

**Luca Piovano, MD**

E-mail: [info@lucapiovano.it](mailto:info@lucapiovano.it)

## Introduction

The periorbital region includes lower and upper eyelid and the external area formed by zygomatic and frontal bone structures. This region is frequently affected by early signs of aging, often requiring intervention in order to improve wrinkles, abnormal pigmentation, skin relaxation, and brow ptosis, albeit, without altering the facial expression<sup>1</sup>. In order to determine the best treatment, it is necessary to define a global approach to the affected area, since most aesthetic defects are often associated. There are two approaches; on the one hand, the surgical route (lower blepharoplasty, upper blepharoplasty, eyebrow lifting and cantopexy, cheekbone lift and lipofilling)<sup>2-4</sup>; on the other, the medical-aesthetic solution, which presents the most used and standardized options, like botulinum or hyaluronic acid injections, peeling treatments and the use dermarollers<sup>5</sup>. Both approaches are often integrated with each other in order to obtain comprehensive results to the subcutaneous-muscular structure, as well as to the skin proper (Figure 1).



Figure 1 - Transdermal technique.

## Materials and methods

Our study was performed on 10 patients who were treated at our office in 2015. Our aim was to verify the effectiveness of the bio-revitalizing treatment by comparing it with the use of dermapen and bio-revitalizing products. Our female patients had a mean age of 53 years (39-73) and no relevant associated diseases. All patients present a light to moderate facial aging (0-2 Lempere scale)<sup>6</sup>.

Each patient was treated in one eye contour area with bio-revitalizing micro-particles (amino acids + noncross-linked hyaluronic acid) (Figure 2). The injected mix was 1 cc of noncross-linked hyaluronic acid + 100 mg of freeze dried amino acid (50 mg of Glycine, 37.6 mg of L-Proline, 5.4 mg of L-Lysine, 7 mg of L-leucine) (Figure 3).

The other eye contour was treated with a 1.5 mm dermapen with controlled mechanical and biorevitalizing damage seeping through small incisions (Figure 4).

Patients were visited 1 day and 7 days after treatment, respectively. Lastly, we assessed patient's satisfaction with the results of treatment, as well as mild-moderate complications, if any, and the discomfort of both treatments, which we determined on the VAS scale and compared with the Students' t-test to define the statistical significance of averages.



Figure 2 - Injectable technique.

1 AMPOULES

Freeze dried Amino Acids (100mg)

- Glycine 50 mg
- L-Proline 37.6 mg
- L-Lysine 5.4 mg
- L-Leucine 7 mg

1 VIALS

- 1 % Sodium hyaluronate 200 kDa - 1 ml

Figure 3 - Description of the injected mix.



Figure 4 - Pre and post treatment.

## Results

During follow-up, we identified a standard trend, both in terms of satisfaction and the onset of complications; on the other hand, we also took account of non-uniformity of assessment, with regard to the pain of both treatments. In terms of the onset of complications, on the first day, 8 in 10 patients had greater swelling in the area treated with bio-revitalizing concentrate injection, whilst 2 out of 10 women did not present any difference with the area treated with dermapen. 2 out of 10 patients had bruising in the area treated with bio-revitalizing concentrate injection. Notwithstanding initial swelling-related discomfort, 7 days after treatment, patients reported greater satisfaction about

the area treated with bio-revitalizing concentrate injection, with an average VAS score of 8.1, compared with a 6.7 scored by the area treated with dermapen (*Tables 1 and 2*). A comparison between our data with Students' t-test yielded a statistically significant average variance ( $p < 0.012$ ).

Finally, we evaluated patient discomfort.

This datum did not demonstrate uniformity in the sample. Patients evaluated discomfort at the time of treatment with bio-revitalizing concentrate injection with a mean of 5.4, while the average VAS score was 5.5, in the area treated with dermapen.

The difference between the two data is not statistically significant ( $p < 0.87$ ).

Patient	Bio-revitalizing concentrate	Dermapen + Bio-revitalizing concentrate
1	7	6
2	9	8
3	8	7
4	6	6
5	9	8
6	10	8
7	8	5
8	7	6
9	9	6
10	8	7
Average	8.1	6.7

*Table 1 - Aesthetic satisfaction in patients after one week from treatment in areas treated with Dermapen + Bio-revitalizing concentrate, and in those treated with only Bio-revitalizing concentrate injection.*

Patient	Bio-revitalizing concentrate	Dermapen + Bio-revitalizing concentrate
1	7	6
2	6	7
3	5	5
4	6	4
5	8	5
6	4	6
7	4	4
8	5	7
9	3	5
10	6	6
Average	5.4	5.5

*Table 2 - Discomfort perceived during treatment with Dermapen + Bio-revitalizing concentrate, or with only Bio-revitalizing concentrate injection.*

## Discussion

Proper treatment of the periorbital area continues to be challenging for plastic surgeons. For a better approach to treatment, it is necessary to fully understand the structures involved in this area's aging process and leverage or counteract their features in order to improve aesthetic results.

Starting from the deepest structure, it is important to identify the bone surface that can function as support and be used for anchors, suspensions or the implantation of prostheses<sup>7-8</sup>.

Next, we reach the orbicular muscle, whose sphincter movement leads, over the years, to the formation of so-called "crow's feet"; the action of this muscle can be countered in a simple and effective way with the use of botulinum toxin. However, although the intent is to counteract the muscle movement and to prevent the formation of additional wrinkles, existing wrinkles must also be treated. The eyelid skin adheres loosely to the orbicular muscle and becomes more evident with age, when subcutaneous tissue and collagen component (which are already very scarce in this area) tend to disappear. What is enhanced, therefore, is thin skin, which is often loose, non-elastic and with dark spots caused by sun damage.

This is, in our experience, the most difficult area to treat. The use of long-chain hyaluronic acid is to be discouraged, since it is often perceptible to the touch in areas where the skin is so thin, and because it will likely migrate due to the action of the underlying muscle<sup>9-10</sup>. The combined use of botulinum toxin, bio-revitalizing concentrate injection and chemical peeling acts at different levels, starting from the muscle up to the horny layer, and considerably improves skin elasticity, texture and brightness. The addition of dermaroller with its controlled mechanical action on the dermis creates a further action of a different type.

Our patient sample showed greater satisfaction with the side treated only with bio-revitalizing concentrate. This result means for us that, although non-crosslinked hyaluronic acid and amino acids have a relatively low molecular weight, percutaneous penetration, even if facilitated, of the dermaroller, is not satisfactory. Conversely, direct injection of bio-revitalizing concentrate, though at first produces greater trauma and greater liquid retention (swelling), eventually minimizes complications and becomes more effecting within one week from treatment.

Amino acids in the bio-revitalizing concentrate, indeed, stimulate collagen synthesis and growth factors. Ultimately, the action is to recreate the normal structure of the dermis, improve tissue nourishment and activate metabolic processes, while also slowing down catabolic reactions. In our experience, therefore, the best non-surgical treatment against aging of the periorbital area is bio-revitalizing concentrate infiltration following botulinum toxin treatment, to be completed with appropriate peeling.

## Conclusions

Treatment of the periorbital area with a combined approach including surgery and aesthetic medicine is always advisable. In our experience, in fact, this area has strong aesthetic and emotional relevance for patients, and effective remedy to aging leads to great satisfaction. Although it requires excellent knowledge in both fields, the dual approach is essential and useful even in cases of small surgical complications, which can be improved through cosmetic medicine measures.

## Disclosure

The authors declare that they have no conflicts of interest and have not received any contributions for this publication.

## REFERENCES

1. Langelier N, Beleznay K, Woodward J. Rejuvenation of the Upper Face and Periocular Region: Combining Neuromodulator, Facial Filler, Laser, Light, and Energy-Based Therapies for Optimal Results. *Dermatol Surg.* 2016; 42 Suppl 2:S77-82.
2. Bernardini FP, Gennai A. Fluid Fat Injection for Volume Restoration and Skin Regeneration of the Periocular Aesthetic Unit. *JAMA Facial Plast Surg.* 2016; 18(1):68-70.
3. Neimkin MG, Holds JB. Evaluation of Eyelid Function and Aesthetics. *Facial Plast Surg Clin North Am.* 2016; 24(2):97-106.
4. Bernardini FP, Gennai A, Quarto R, et al. Superficial Enhanced Fluid Fat Injection (SEFFI) to Correct Volume Defects and Skin Aging of the Face and Periocular Region. *Aesthet Surg J.* 2015; 35(5):504-15.
5. Pao KY, Mancini R. Nonsurgical periocular rejuvenation: advanced cosmetic uses of neuromodulators and fillers. *Curr Opin Ophthalmol.* 2014; 25(5):461-9.
6. Lemperle G, Holmes RE, Cohen SR, Lemperle SM. A classification of facial wrinkles. *Plast Reconstr Surg.* 2001; 108(6):1735-50; discussion 1751-2.
7. Naik M. Blepharoplasty and periorbital surgical rejuvenation. *Indian J Dermatol Venereol Leprol.* 2013; 79(1):41-51.
8. Mendelson B, Wong CH. Changes in the skeleton with aging: implications and clinical applications in facial rejuvenation. *Aesthetic Plast Surg.* 2012; 36(4):753-60.
9. Bravo BS, Rocha CR, Bastos JT, Silva PM. Comprehensive Treatment of Periorbital Region with Hyaluronic Acid. *J Clin Aesthet Dermatol.* 2015; 8(6):30-5.
10. Trussler AP, Byrd H.S. Management of the midface during facial rejuvenation. *Semin Plast Surg.* 2009; 2(4):274-82.

# The anatomical and physical principles, and proper strategy for implanting polylactic acid suspension wires into various parts of the body

Bruno Bovani<sup>1</sup>, Saverio Bovani<sup>2</sup>, Walter Bugiantella<sup>1,3</sup>

<sup>1</sup>MD, PhD, "Bruno Bovani Surgery and Aesthetics" Centre, Via M. Angeloni, 43 - 06124 Perugia - Italy

<sup>2</sup>School of Medicine, University of Perugia, Italy

<sup>3</sup>MD, PhD, School of Biotechnologies, University of Perugia, Italy

## Abstract

Nowadays, the non-surgical treatment of loose skin on body contours is one of the main requests from our patients. The decline in demand for major surgery worldwide has stimulated research into a technique that could allow an effective result, on an outpatient basis, without the need for any convalescence period. The experience we have gained of implanting polylactic acid suspension wires in the face was the starting point for developing a new technique, aimed exclusively at correcting slackness in body skin. We have reconsidered the anatomical know-how in our possession and, by making the necessary changes, have created a much more suitable implant model, particularly for the abdomen, inner arm and inner thigh areas.

Between May 2013 and May 2016, we treated the following patients: 32 on the abdomen, 22 on the arms and 16 on the thighs. The patients were all female, and 37 to 62 years of age.

The procedure was found to last 30-40 minutes and was well-tolerated, with daily activities being resumed as soon as the procedure ended. We found no major or minor complications either during or after the treatment.

Even immediately post-treatment, it was possible to note a marked improvement in the tautness of the skin. After about 60-90 days there was a stable improvement in skin tone and the tissue laxity induced. 6 months later, the results had remained stable, whilst after 1 year an initial decline was observed.

This technique can therefore be considered a safe and effective method. Experience, respect for anatomy and patient selection are fundamental aspects in obtaining the best results in each individual case.

## Keywords

Polylactic acid, suture, cones, abdomen, thighs, arms, rejuvenation

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

**Bruno Bovani, MD, PhD**

Address: "Bruno Bovani Surgery and Aesthetics" Centre - Via M. Angeloni, 43 - 06124 Perugia - Italy

E-mail: [bovani@tin.it](mailto:bovani@tin.it)

## Introduction

Over recent years, there has been an increase in requests for the correction of skin slackness in different areas of the body. Next to the face, which remains the main request, the demand for treatment of slack skin on the front abdominal wall and the inner arms has increased. Major surgery (surgical facelift) has undergone a decline over recent years, in favour of less invasive techniques that ensure a much shorter post-operative decursus with the immediate recovery of daily activities<sup>1,2</sup>. For example, new non-invasive instrument technologies, such as radio-frequency and micro-focalised ultrasound, have been introduced in order to activate neo-collagenesis and the production of new elastic fibres, thereby reducing skin slackness<sup>3-8</sup>.

Re-absorbable suspension threads were introduced, which, in addition to creating an immediate lifting effect, stimulate the fibroblasts over time to produce fibroblasts, collagen (types I and III) and elastic fibres<sup>6-13</sup>. These new techniques are vastly different from a surgical facelift, which remains a more definitive, but far more invasive intervention, since these activate more tissue stimulation and regeneration, which allows a “softer” lifting effect, which is less immediate, structurally different, less long lasting, but which is repeatable, less invasive and less expensive.

Based on our accumulated experience of using resorbable threads for facial slackness, we have dealt with treating skin slackness in other areas of the body, in particular, the anterior abdominal wall, the inner arms and the inner thigh regions, using wires fitted with bi-directional cones.

After some initial experiences which were characterised by poor results, we reconsidered our own anatomical ideas and, by making the necessary changes, created a model implant that is far more suitable for the abdomen, inner arms and inner thighs.

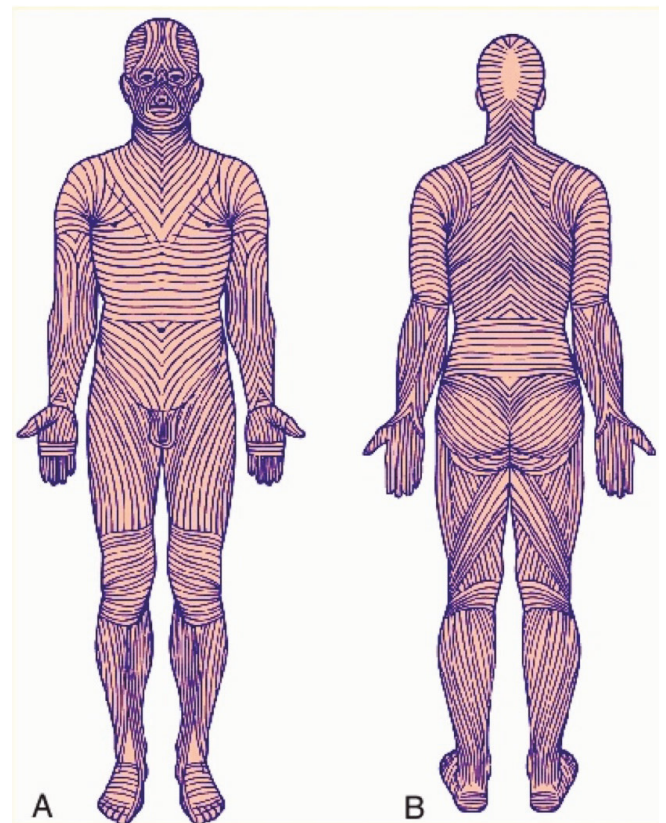
## Materials and methods

### *The lines of Langer*

The presence in the skin of lines that correspond to the orientation of natural tension vectors in the skin with a lower tension was first described by Langer in 1861. In 1942 Cox, and later Stark in 1977 demonstrated that the direction of Langer’s lines remains, even after skin is removed from the body and the tension to which has been subjected is resolved, and concluded that these lines had an anatomical basis<sup>14-16</sup>.

By analysing the direction of the collagen fibres in the dermis, Cox and Stark showed that there was a correlation between the direction of the collagen fibres in the dermis and the direction of Langer lines.

Therefore, the presence and orientation of Langer lines (*Figure 1*), in our opinion, should always be considered when suspension sutures are used to reduce skin slackness in the various areas of the body.



*Figure 1 - Table of Langer lines, anterior and posterior.*

### *Sutures used*

The sutures we use are made of a resorbable material (polylactic acid) and are fitted with re-absorbable cones (made from polylactic acid and glycolic acid). Each suture has two sets of cones: these two series have the same number of cones, and are oriented in opposite directions towards the two ends of the suture. The cones are inserted into the suture and held between two nodes which are placed 0.5 cm or 0.8 cm from one another. The central part of the suture measures 2 cm and is devoid of cones. Three different lengths are available for this type of sutures: 30 cm (8 cones), 27.5 cm (12 cones) and 26.7 (16 cones). The suture material (polylactic acid) is completely re-absorbed in

18-24 months: it acts in the subcutis, stimulating the fibroblasts to produce fibres and collagen, which helps to gradually increase the volume of the area. The cone material (82% L-lactic acid and 18% glycolic copolymer) is reabsorbed entirely in 8-12 months<sup>17</sup>. The cones have a (smooth) 360° surface anchorage to the subcutaneous tissue, which allows an instant and solid fixation. As foreign bodies stimulate the inflammatory reaction, they slowly degrade them, and a fibrous capsule is formed around them: this fibrous reaction consolidates support of the adipose tissue, and prevents the risks of migration or extrusion<sup>13</sup>.

**Technique for treating anterior abdominal wall slackness: the 4-technique**

The technique provides for the insertion of 2 poly-lactic acid wires with 12 or 16 cones, longitudinally in correspondence with the alba line, using a narrow V technique (with an opening oriented towards the navel), both above and below the position of the umbilicus, put in place with a moderate tension (to prevent the wires sliding, which could tear the subcutaneous tissue). This allows the right abdominal quadrants to be divided from the left, due to stiffening of the tissue at the midline. These are the lines of Langer, with their various orientations and directions between the supra-umbilical and sub-umbilical regions, which allow the abdomen to be divided into four separate quadrants. Hence this technique is defined as the '4-Technique' (Figure 2). At this point, following the direction of the Langer Lines, for each quadrant, a 12 or 16 cones wire is implanted (depending on the size of the patient), using a U-shaped technique, with a tension direction distributed from the medial area to the side area.

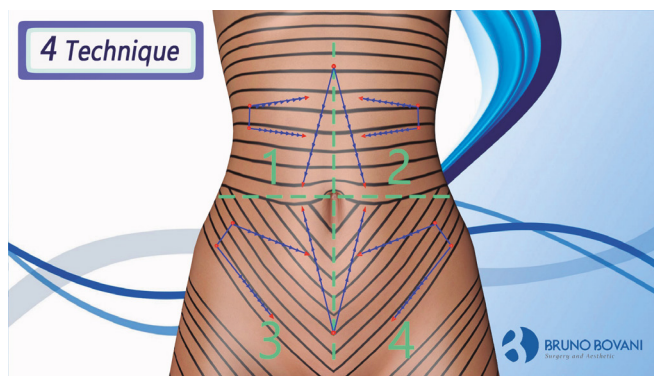


Figure 2 - 4 Abdominal technique.

**Technique for treating slackness in the inner arm regions: the Tau-technique**

To avoid cancelling the opposing tensile forces that the suspension wires can generate, we decided to separate the surface of the arm in an anterior and a posterior area, taking the distribution of the Langer lines into account at all times.

The technique therefore provides for an initial implantation of 1 or 2 wires with 16 cones by a linear technique in correspondence to the medial region of the arm. This allows resistance to the opposed sliding of the wires to be created, simulating separation of the circular surface of the arm into two semi-circular areas. At this point, since slackness in this region finds its

own maximum expression precisely corresponding to its medial area, 1-2 wires are implanted with 12 or 16 cones using the C technique, on the axis of the Langer lines, with traction vectors from the medial region to the lateral region.

The shape that the implant of these wires takes, which resembles a Tau cross, dictated the name of this as the Tau-Technique (Figure 3).

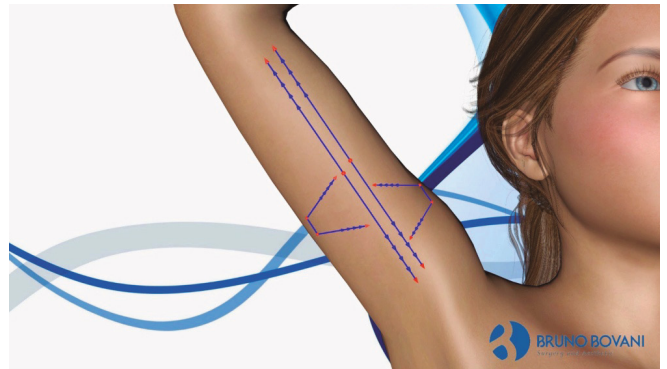


Figure 3 - Tau-technique arms.

**Technique for treating slackness of the inner region of the thighs: the Tau-technique**

The surface of the inner thigh region is separated into an anterior to a posterior area, again taking the distribution of the Langer lines into account.

The technique therefore provides for the initial implantation of 1 or 2 wires with 16 cones using a linear technique, in correspondence to the medial region of the thigh.

This allows a resistance to the opposed sliding of the wires to be created, simulating the separation of the circular surface of the thigh into two semi-circular areas. At this point, 1-2 wires are implanted with 12 or 16 cones using a C technique, in axis with the Langer lines, with traction vectors from the medial region towards the lateral one (Figure 4).

It is important to identify (using a Doppler or echo-colour-Doppler device) and mark the path of the great saphenous vein before starting the procedure to position the threads, in order to avoid an accidental puncture and to create a safe area during the implantation.

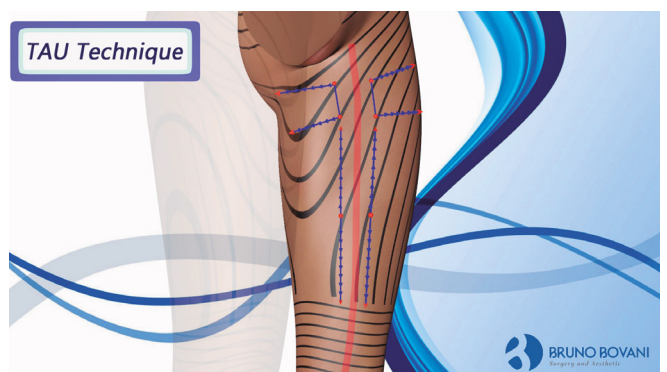


Figure 4 - Tau-technique thighs.



## Results

Between May 2013 and May 2016, we treated the following patients: 32 abdominal patients, 22 inner arm patients and 16 inner thigh patients.

The patients were all female, and from 37 to 62 years of age. The patients selected had a slackness measured by the pinch-test of between 1 and 2 cm; lower values were excluded due to the risk the cones would be visible on the surface; higher values were excluded because the adipose tissue present could have compromised the result. The patients were all monitored at 15 days, 2 months, 3 months, 6 months and 12 months.

In choosing the type of wires to be used, measurements taken of the surface to be treated on the patient played a fundamental role. As a rule, 16-cone threads were used for all areas of the body; when the morphological characteristics demanded it (limited surfaces in the regions being treated), 12-cone wires were used.

Depending on the size of the various body areas, 12 or 16 cones were implanted. 8-cone wires were never been used because they have a tensile strength that is too low for the body districts in question.

Normally, 6 threads are used to treat the abdomen; where there is a limited treated surface, 4 wires are used (2 vertically positioned with the linear technique and 2 positioned laterally with the "C" technique) (Figure 5).

Normally, 3 wires are used for the arm; where there is an increase in the dimensions of the treated area, up to 6 wires (2 longitudinally positioned with the linear technique and 4 positioned transversely with the "C" technique) are used (Figure 6).

For the inner thigh, 4 wires were normally used, with a maximum of 6 wires for large surfaces (2 positioned longitudinally with the linear technique and 4 positioned transversely with the "C" technique).

All of the treatments were performed with the patient correctly positioned on an operating table.

The treatments lasted 30-40 years and were well tolerated by the patients, who were able to resume their daily activities immediately after the procedure (apart from suspending sporting activities for 15 days).

We did not detect any major complications; the only minor complications were bruising and some irregularities of the skin surface.

In rare cases, bruising may occur (especially after treating the arms) which resolves spontaneously in about 15 days.

Immediately post-treatment, it is very common to have irregularities of the skin surface, which resolve spontaneously within 7-10 days.

Approximately 60-90 days after implantation, a stable improvement in skin tone and tissue firmness can be observed, probably induced by the neo-collagenesis process due to the initial poly-lactic acid resorption process.

At the check-up 6 months after implantation, the results were still stable, whilst after 1 year, the beginning of a descent was observable.

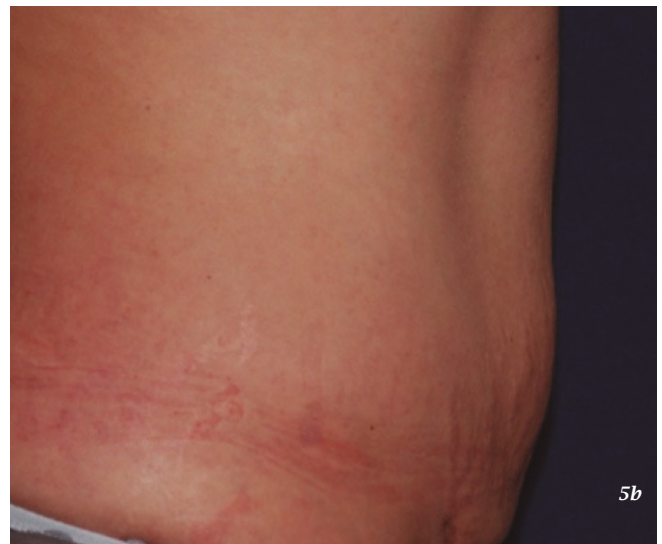
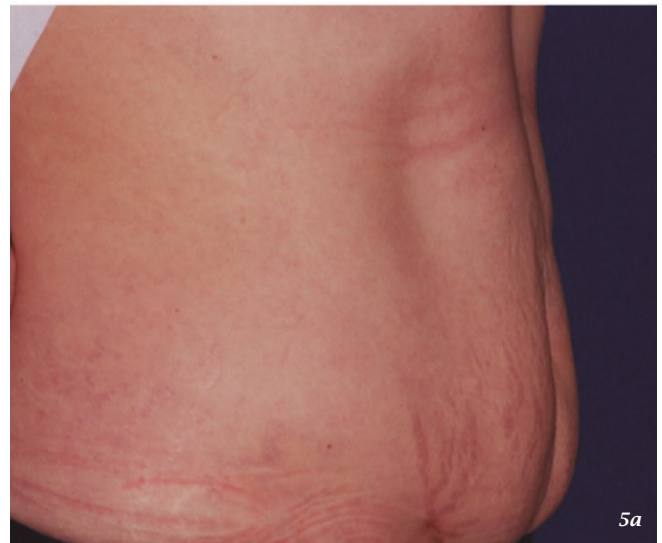


Figure 5 - Treating slackness of the anterior abdominal wall with the 4-technique; before (5a) and after (5b).

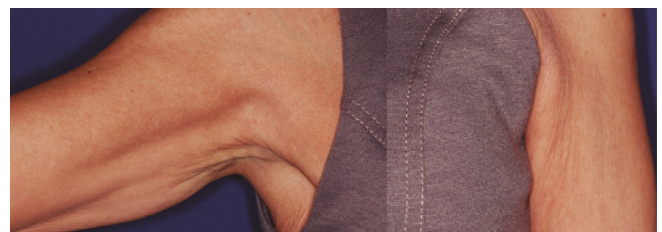


Figure 6 - Treating slackness of the inner arm region using the Tau-technique; first (top) and then (bottom).

## Discussion

The use of poly-lactic acid suspension wires for treating slackness of the abdominal wall, the inner arms and inner thigh regions arose from the experiences gained from using them on the face.

However, the anatomical differences between the various body districts demands a careful assessment of Langer's lines and the adoption of implantation techniques that are specifically designed to successfully treat large flat areas of skin (such as the anterior abdominal wall) or semi-circumferential areas (such as the inside of the arms and thighs).

One needs to be well-acquainted with the techniques for implanting the suspension wires, and above all, to use the correct anatomical plane for inserting the threads themselves. To facilitate wire implantation, we recommend the use of an operating bed and correctly positioning the patient.

During implantation, the fact that the patient complains of intense pain can be attributed to the needle reaching a layer that is too deep and puncturing the muscle fascia. This should be assiduously avoided to prevent complications in the post-treatment period.

Careful selection of patients is also important for avoiding those in which the results will be poor, i.e. those with excess adipose tissue (in which the threads will not be able to reduce the slackness) and those with skin and subcutaneous tissue that is too thin (in which the cones will be excessively visible on the surface for several months).

We believe this method offers considerable advantages. First of all, the correction of skin laxity of the body with this method is carried out in a surgical outpatient's clinic, without any patient admission, under local anaesthesia. The implant usually takes only 30-40 minutes and allows almost immediate recovery of daily activities, even if with some limitations on sporting activities in the first 15 days. This method has also proved to be easily repeatable over time, with results that improve with subsequent implants. Sub-dividing the areas to be treated into quadrants also means that interventions can be performed in several steps, both to consolidate the result over time, and in response to the patient's requirements (dividing the treatment into several phases also spreads out the cost). Last but not least, this method is considerably less expensive, and does not require any period of convalescence post-treatment, compared to a surgical face lift, even if the results are less long-lasting.

## Conclusion

The use of poly-lactic acid suspension wires in the treatment of slackness of the abdominal wall, and the inner regions of the arms and thighs can be considered to be a safe and effective method.

Experience, respect for anatomy and patient selection are fundamental aspects in obtaining the best results in each individual case.

## Disclosure

The authors declare that they have no conflicts of interest and have not received any contributions for this publication.

## REFERENCES

1. Fitzgerald R, Graivier MH, Kane M, et al. Nonsurgical modalities to treat the aging face. *Aesthet Surg J*. 2010; 30 Suppl:31S-5S.
2. de Benito J, Pizzamiglio R, Theodorou D, Arvas L. Facial rejuvenation and improvement of malar projection using sutures with absorbable cones: surgical technique and case series. *Aesthetic Plast Surg*. 2011; 35(2):248-53.
3. Sadick NS, Manhas-Bhutani S, Krueger N. A novel approach to structural facial volume replacement. *Aesthetic Plast Surg*. 2013; 37(2):266-76.
4. DiBernardo BE, DiBernardo G, Pozner JN. Subsurface Laser and Radiofrequency for Face and Body Rejuvenation. *Clin Plast Surg*. 2016; 43(3):527-33.
5. Hart DR, Fabi SG, White WM, Fitzgerald R, Goldman MP. Current Concepts in the Use of PLLA: Clinical Synergy Noted with Combined Use of Microfocused Ultrasound and Poly-L-Lactic Acid on the Face, Neck, and Décolletage. *Plast Reconstr Surg*. 2015; 136(5 Suppl):180S-187S.
6. Goldberg D, Guana A, Volk A, Daro-Kaftan E. Single-arm study for the characterization of human tissue response to injectable poly-L-lactic acid. *Dermatol Surg*. 2013; 39(6):915-22.
7. Safran T, Gorsky K, Viesel-Mathieu A, Kanevsky J, Gilardino MS. The role of ultrasound technology in plastic surgery. *J Plast Reconstr Aesthet Surg*. 2017; pii: S1748-6815(17)30366-2.
8. Lowe NJ. Optimizing poly-L-lactic acid use. *J Cosmet Laser Ther*. 2008; 10(1):43-6.
9. Krieg T, Aumailley M, Koch M, Chu M, Uitto J. Collagens, elastic fibers, and other extracellular matrix proteins of the dermis. In: Goldsmith LA, Katz SI, Gilchrist BA, et al., editors. *Fitzpatrick's Dermatology in General Medicine*. (8th ed). New York, NY: The McGraw-Hill Companies. 2012; 666-91.
10. Fisher GJ, Varani J, Voorhees JJ. Looking older: fibroblast collapse and therapeutic implications. *Arch Dermatol*. 2008; 144:666-72.
11. Romo T III, Al Moutran H, Pearson JM, Yalamanchili H, et al. Skin wound healing. Medscape. Available at: <http://emedicine.medscape.com/article/884594-overview>. Accessed August 27, 2012.
12. Liu X, Wu H, Byrne M, Krane S, Jaenish R. Type III collagen is crucial for collagen I fibrillogenesis and for normal cardiovascular development. *Proc Natl Acad Sci USA*. 1997; 94(5):1852-6.
13. Consiglio F, Pizzamiglio R, Parodi PC, et al. Suture with resorbable cones: histology and physico-mechanical features. *Aesthet Surg J*. 2016; 36(3):NP122-7.
14. Cox HT. The cleavage lines of the skin. *Brit J Surg*. 1942; 29:234.
15. Stark HL. Directional variations in the extensibility of human skin. *Br J Plast Surg*. 1977; 30(2):105-14.
16. Ridge MD, Wright V. The directional effects of skin. A bio-engineering study of skin with particular reference to Langer's lines. *J Invest Dermatol*. 1966; 46(4):341-6.
17. de Benito J, Pizzamiglio R, Theodorou D, Arvas L. Facial rejuvenation and improvement of malar projection using sutures with absorbable cones: surgical technique and case series. *Aesthetic Plast Surg*. 2011; 35(2):248-53.

# Sexuality and beauty: intimate relations

Nicoletta Garisto<sup>1</sup>, Annarosa Catizzone<sup>2</sup>

<sup>1</sup>University Magna Græcia of Catanzaro

<sup>2</sup>MD, Italian Society of Aesthetic Medicine

---

## Abstract

Only recently have we come to a freedom in terms of our body management; one that finally gets a new role that is no longer a docile body but a flexible one, which changes through personal choice and action. It is up to each individual to take responsibility for their own body design because, through the body, we define ourselves and our identity making the body become a visible and personal identity. It is a thoughtful project, in which the lifestyle, guided by the regimes, is essential: “the appearance of the body, its behaviour, its own sensuality, the ways of undoing basic needs, food, and clothing”.

New body management techniques, the ones called reflexive, are also very important: their main task is to work on the body to modify it; trying to keep it or adapt it in the most appropriate and responsive ways depends on the individual. Amongst all of these techniques, there is also the aesthetic surgery.

The purpose of this work is to deeply study the motivations that induce people to undergo cosmetic medicine treatments. With this type of research I want to show all the reasons behind something that can be seen as an apparent aesthetic need. There was a research that focused on the evaluation of the relationship that links sexuality to beauty and the motivations that push a woman to undergo to aesthetic medicine treatments.

## Keywords

Sexuality, beauty, body, cosmetic, medicine treatments

---

Accepted for publication 25 January 2018 - © Salus Internazionale ECM srl - Provider ECM n° 763

## Correspondence

**Nicoletta Garisto**

University Magna Græcia of Catanzaro

Phone: + 39 3298452020

E-mail: [nicoletta.garisto@studenti.unicz.it](mailto:nicoletta.garisto@studenti.unicz.it) - [nicoletta.garisto89@gmail.com](mailto:nicoletta.garisto89@gmail.com)

---

## Introduction

The aim of this work is to analyze the reasons that lead people to undergo aesthetic medicine treatments. This kind of research shows what can be hidden behind an illusory purely aesthetic necessity. Underlying this work was a research that focused on the analysis of the relationship between sexuality and beauty, and the reasons that lead women to undergo aesthetic medicine treatments.

Furthermore, the research has examined in depth how the necessity of changing something about themselves, for real problems or for aesthetic wishes, grows and becomes real.

## Material and methods

The method that has been used to gather the declarations about this kind of research is a qualitative method, because this method allows the achievement of the predetermined goals through the collection of both stories and in-depth interviews. Because, as Patton asserts «qualitative methods are highly personal and interpersonal, because naturalistic inquiry takes the researcher into the real world where people live and work, and because in-depth interviewing opens up what is inside people»<sup>1</sup>.

More specifically, it is a biographical type of interview, a research technique that focuses on the biographic study and the reconstruction of the past of the person interviewed, thanks to the confidentiality and the freedom of expression given to the subject. The biographical interview is a specific application of in-depth interview; it involves unstructured interviews and open-ended questions. The peculiarity of the unstructured interview, also known as depth interview, resides in the individuality of the topics and in the itinerary of the interview. The interviewer has only one job: to speak about the topics he wants to speak about; then, the interviewer will let the interviewee develop his way; keeping the initiative of the conversation, stimulating him or leading him to in-depth analysis when there is a connection with interesting topics. The interviewer has to encourage and stimulate the interviewee and he also has to control the conversation, containing the digression and avoiding off topic comments<sup>2-4</sup>.

Furthermore, I have chosen to use the qualitative interview because the actions of listening and mediation of the interviewer carry out a function of care towards the interviewed<sup>5-8</sup>. In qualitative research, without listening to the other one, there cannot be the comprehension of his point of view, through that process of identification, from the interviewer to the interviewed, essential for the collection of data<sup>9</sup>.

In-depth interviews were 15, pointed towards women exclusively, and aged between 30 and 60, integrated with phone interviews. Each interview has been anonymous and confidential. Indeed, each person who joined this research required anonymity and the names used are fictitious names.

As the interviewer, I have always respected these tasks. I have always kept the feedback with the interviewee under control after the primary question because, as

Rogers says: «An essential part of the interviewer's job is the use of techniques in order to focus on and to control the interaction after the primary question, in this way the aims will be achieved properly»<sup>10</sup>.

A typical intervention is represented by the use of the probing questions: these are not proper questions, these are neutral stimuli that have the function to encourage the interviewed to move forward, to lower his defensive barriers, to examine in depth the topic, to give more details<sup>11-12</sup>. This is useful to fix the common problem: to receive incomplete, inaccurate and unsuitable answers. I have tried to keep the topic unchanged, avoiding the use of sentences like “cut to the chase”, “summarize”, etc... therefore, I have tried to accept, respectfully, the interviewed point of view without judgement, neither positive or negative. Sometimes, it was hard to keep an impartial attitude, because of the sensitivity of the topics<sup>13</sup>.

Furthermore, during the interviews, I always tried to take advantage of the moments of silence of the interviewed, using them to encourage her to examine in depth a specific topic and I forced myself to focus on that topic without thinking about the next question to ask. The social and physical place in which the interviews have been realized, has been chosen by the interviewed themselves, so they could feel comfortable and free to express themselves in the most spontaneous way<sup>14-16</sup>.

This work is developed on an investigation about “the beauty's world” which focuses on the necessity of a detailed study about the sexual dimension inside itself. The theoretical propositions and the conceptual tools that I chose for the interpretation of “the beauty's world”, have concerned many authors that approached those concepts in different ways.

More specifically, Bourdieu sees the human being as a thinking body and he asserts: «I am the body that I have. We learn through our body. The social order enrolls inside the bodies through this enduring comparison, more or less dramatic, but that always leaves space to the affectivity and, more specifically, to the affective transactions with the social place»<sup>17</sup>.

Indeed, Remaury, regarding the relationship between health and beauty, thinks that the body fulfillment is based on the youth-beauty-health triad: beauty corresponds with youth, gained by health. Therefore, health shows the beauty, the biggest expectation about the present body's cult and the first duty about the self-care<sup>18</sup>.

The pluralization of the current social context highlights how much, nowadays, there is a freedom of managing our own body that accepts a new role, not more a docile body but a flexible one, target of choices and actions that are personal: each one, then, has the responsibility of his own design because, through it, his identity can be determined, the body becomes a visible messenger of identity itself<sup>19</sup>. Furthermore, new techniques for the management of the body, called reflexive, should be considered important: their main aim is to work on the body in order to alter it, preserve it or adapt it in the most suitable way, depending on the subject's necessity. Aesthetic surgery is one of these techniques.

The body-project includes another innovation: the privatization of the body, or better, the privatization of the agencies of social production of the body, the

demonstration of the ruling uncertainty in modernity<sup>20</sup>. Current societies are, just like yesterday, somatic societies: inside of them, body becomes political and a cultural field of battles<sup>21</sup>.

According to Juvin, the body becomes bank and market, it is a standard of truth, because it is the only one that remains, as a constant, in our past. The body is the center of the power, object of all the expectations. According to Juvin's theory, if in the past the soul reigned, in this wellness civilization, the body is the ruler<sup>22</sup>.

Therefore, in a society like the current one, where the communication, being multimedia, is able to reach a lot of interlocutors instantaneously (normally, women are more involved than men), it is easy to impose beauty's models and ideals and so Remuary asserts that «This augmentation of the beauty's models is caused by the media (journalists and advertisers): their aim is to sell female beauty's models repeated a lot of times, whose intensity - despite the attacks of which women are victims - not only doesn't reduce but it continues to grow during the years. Today, the image of the realized body goes with a higher and higher number of moments of our lives - from the grains we eat at breakfast, to the time we spend at the cinema»<sup>18</sup>.

## Results

The results of this research are:

### *A strong social conditioning exists at the bottom of the decision that moves women to undergo aesthetic medicine treatments*

One of the reasons that convinces women to resort to aesthetic medicine is the desire of an improvement in order to like themselves more and to be liked by the others. Indeed, social desirability influences the choices of the social actors.

Giovanna, 31, explains how her problem influenced herself in her social relationships:

«This problem affected my self-esteem and my relationship with others. It affected me so much it limited my routine. In the morning, for example, I rarely put my make-up on... because I don't have time, desire, because in the past I didn't need to do it; now it became a complex, to show myself to the others, without my make-up on is awful... it leads me to bend, to walk with my head down... I would rather appear rude not saying hi to someone than to show myself with no make-up on.

Basically, I organize it: if I have to pop in to the Garden [a famous meeting place in the city of Catanzaro] to buy cigarettes, I put my make-up on or I'd rather not stop by, there is no other option. I care about the judgement of the people who know me... of course, if I go in a new place it is normal that I feel more sorry if a guy, maybe a nice one, sees me in that way... in the places that I already know it is the same... man or woman, it is the same! [...] The idea that the others have about you influences you anyway. Everyone's opinion. All that we are is the result of what the

others want (us to be)».

Maria, 40, regarding how the social conditioning can bring a woman to do aesthetic medicine treatments, says:

«Some women decide to have a makeover because they are influenced by what surrounds them, they look for the way to find themselves, they want to find self-confidence in an outward change.

There are also women that seem like fools to me, that do it only because they are influenced by a stereotype to which they want to conform to».

### *The relationship with sex changes according both to the age and to the perception that the social actor has about herself*

Lucia, 60, married and mother of three, resorted to aesthetic medicine after a family crisis which involved the relationship with her husband. About the way in which sexuality changes during the years, so she says:

«Now it is important for me to like myself, before pleasure was important for me. Unfortunately, sexuality with my husband has changed, he has got a problem, a prostate cancer, for this reason we no longer have sex, but before his operation sex was different, it has changed over time because it is normal... when you are self-confident you have a different attitude, you dare more».

Francesca, 55, says that she resorted to aesthetic medicine because she needed to be "re-born" after a difficult period and after an abortion. Regarding the relationship between sexuality and beauty she says that:

«It is true that, when you like yourself, you are more liked by the others... even when you have sex but most of all in what precedes sex... you are more self-confident and, as a consequence of that, you transmit your self-confidence to your partner. I always liked myself, but it is obvious that, with a little help, everything becomes easier».

Laura, 50, wife and mother, had breast surgery twice and speaking about the relationship with sex, she says:

«The first time I had breast augmentation I did it not for myself, because I could have worn a push-up bra, the problem is with the other sex, if you have to take off your clothes in front of a man and you don't like yourself, you feel uncomfortable.

You can have toned legs but if you have two awful boobs, what does it matter? I live only for my job, I don't care about anything else... it sounds bad but also my friends, my family, my daughter, everything is subsequent to my gym... my life is my job so it is normal that my job has influenced and will always influence my life choices. During the years, I noticed physical changes but also a very strong change about sex, I used to be a panther... I trained as much as I wanted to have sex... now it is not the same, after the pregnancy everything has changed... my lust is equal to zero. I don't have arousal. I don't have the desire to make love, even though my husband is five years younger than me and he goes through

everything. Honestly, my relationship with him is less passionate than before, but we grew up a lot.

The rhythm and the frequency decrease because we both have chaotic lives and, honestly, when I come back home I set up, I reorganize and then I just want to rest, holding my husband but I want to relax».

And then, about this topic, she asserts that:

«Even in sex... come on, you know that a man doesn't notice your foot's nail, but we... do! We must be perfect... light turned off or suffused in order to hide as much as possible our flaws... but the thing is... in that moment a man just wants to reach the orgasm, he doesn't care about your nail, he doesn't care about your extra pound!».

### ***Trusting the doctor who does the operations is essential for the prosecution of the treatments.***

After the declarations of the interviewed it is clear that an essential role in the decisional process, which moved these women to undergo aesthetic medicine treatments, has been played by Doctor Catizzone. Her way to approach her patients, the comprehension and the reassurances she gave to them, can be considered as shared and decisive factors for all the women interviewed.

Giovanna, 31, says that:

«Of course, if I hadn't known about the Doctor's "reputation", I would have relied on no one else... if I hadn't had the certainty that the Doctor had the right competences, I would have entrusted my face to her care... because an arm is an arm, but a face is a face».

Barbara, a 50 years old interviewee, says that for a long time she had the desire to undergo aesthetic operations but only the meeting with the Doctor gave her the right confidence, so she declares:

«I have been thinking of doing them for a long time but I made my decision only when I met the Doctor. I was scared, you never know who you can find... then I met the Doctor and my experience started. I rely on her entirely. This plan is good for now, then we'll see... when I get old we will decide what to do».

Lucia, 60, asserts that in the figure of the Doctor she found, first of all, a person inclined to listen, so she says:

«I was wasted, my weight was 48 kgs, my face was marked... I would have changed everything about me... luckily, I met Rosanna who didn't permit it and she proceeded step by step... I've been using botulin and hyaluronic acid for a year... once a year, but then I continue with a vitamin cycle. The doctor, who is a very honest person, has suggested to me to proceed slowly and to start with the face revitalization. Since then, I never come here saying "do this to me" but I say to her: "Rosanna, how do I look to you? What can we do?". I totally trust her. I want to say it again, when I came here for the first time I would have done everything, I would have spent millions!».

Serena, 40, says that she does annual mesotherapy treatments and, as a consequence of a brutal accident, she had to do a facial plastic, 20 years earlier and, regarding the relationship between doctor and patient, she asserts:

«I went to the Doctor and I trusted her because she doesn't want to take advantage of her activity; if you go to her, asking her to do lips augmentation, she says no...and before doing something she examines the reasons, she is a kind of psychologist!».

### ***A shared opinion regarding the female standard of beauty exists***

Giovanna, 31, resorted to aesthetic medicine after a true problem, more than an aesthetic one, so she speaks about what for a woman should be considered the strength of her own body:

«In my opinion, a woman is beautiful if she has a beautiful face, her weight can also be 200 kgs but she should have a beautiful face... perfection is hard to be reached, everyone has her own flaws (and women are very good at finding them!) but for me the most important thing is to have a not big enough nose, expressive eyes, whatever color, plump lips... and teeth... teeth are always important... I watch everyone's teeth. The body impresses me less, both in women and men. The more a man is toned, the less I like him».

Lucia, 60, about what captures the attention of a man regarding a woman, says:

«We should understand which is the most important thing also for men... I mean, a young lady could have the will to do breast augmentation in order to be more attractive. For a man, for example, the breasts, the buttocks, the lips are more important. I think that for a woman the face is more important... also the breasts, but the buttocks less, I think! I mean, b-side is the first thing a man looks at».

Bianca, 38, who had some problems on her face because of a violent cystic acne, about her idea of beauty asserts:

«I am an aesthete, I like beauty! I know that I am not beautiful, I can be appreciated or not, I know which are my strengths and my weaknesses. Beauty, even though it could be a superficial concept, is aesthetic. There are well - defined aesthetic standards: a tall, slim, wiry woman with a beautiful breast, not a 4th size or a 5th size of bra, but that fits with her body... that a woman is "curvy" is not a problem for me but she also has to have a beautiful face.

The thing is: if you have a beautiful body, the face (which is important anyway), can be less important than the body; if you have a curved body, you should have a beautiful face inevitably... I find beauty there and for this reason it overshadows the body. The man, indeed, has totally different standards of beauty. It depends on the man, if he is a man with capital "M", he would agree with me, but it is not a common situation, I have a very bad consideration

about men and I feel more sorry because I have a son... but I will do my best to help him grow up also with a female point of view, so he can see everything from every perspective. Anyway, I think that there are men, not a lot, that appreciate women beyond their aesthetic beauty».

Marta, 40, regarding her idea about a beautiful woman and how a man considers a beautiful woman, expresses her point of view:

«In my opinion, a beautiful woman should have a beautiful face, that's all. A man looks at a beautiful bottom, beautiful boobs and he no longer understands. A man, honestly, thinks with everything but his head. I am sure that, no man likes a too plumped lip. He could be more attracted by the body. I think that, if a woman has a toned body and beautiful breasts, she is ok with that and it is normal that a man likes her, but a deformed face, because of surgery, no, I think that nobody likes it».

Laura, 50, admits that she lives the research of beauty as an extreme love for her own body, so she asserts, regarding her idea of aesthetic beauty:

«In my opinion, the physique is more important than the face... I mean physique in all senses. I don't agree with medicine, I don't agree with something that could hurt our body. I always say to my daughter "you don't have the right to use drugs, not because drugs are illegal, but because you are in good health and you don't have the right to take off your health when there are people that are born and live in a wheelchair. If you have life and beauty you can't ruin them, you don't have the right to do that, on the contrary, you have to defend them". In my opinion, beauty and health are on the same road. As for beauty, I think that women and men have different standards. Women do everything for being thin, toned, we do a lot of sacrifices and then, maybe, men look at the one with a big bottom, a shapely woman. I like when a woman is not too shapely. I don't like too slim women and neither do men... they can't stimulate a sexual desire, they can make men feel tenderness and we can envy them for the way in which they can wear a dress. We actually create a lot of problems... we personally let men notice our own flaws because otherwise it is not clear how some women, objectively ugly, could be liked by men».

### Conclusion

This research has put in evidence the strong collaboration between two disciplines very different between them, sociology and medicine. This research focused on the evaluation of the relationship that links sexuality to beauty and the motivations that push a woman to undergo aesthetic medicine treatments.



## REFERENCES

1. Patton MQ. *Qualitative Research & Evaluation Methods*, 3rd Edition. University of California: SAGE Publications; 1990.
2. Denzin NK, Lincoln YS, *The Sage Handbook of Qualitative Research*, 3rd Edition. Thousand Oaks: SAGE Publications; 2005.
3. Giele J, Elder G. *Methods of Life Course Research. Qualitative and Quantitative Approaches*. Thousands Oaks: SAGE Publications; 1998.
4. Silverman D. *Interpreting Qualitative Data*, 3rd Edition. University of Michigan: SAGE Publications; 2006.
5. Barnao C. L'osservazione partecipante per la comprensione dei fenomeni di marginalità sociale, in «Salute e Società»; 2007.
6. Corposanto C. *Narrazioni di salute nella web society*. Soveria Mannelli: Rubbettino; 2017.
7. Rogers C. *La terapia centrata sul cliente*. Firenze: Martinelli & C.; 1994.
8. Hutchinson SA, Wilson ME & Wilson HS. Benefits of participating in research interviews in «Image: The Journal of Nursing Scholarship»; 1994.
9. Homans GC. *The Human Group*, Brace, Harcourt; 1950.
10. Rogers C. *Counseling and Psychotherapy*. Boston: Houghton Mifflin; 1942.
11. Corbetta P. *La ricerca sociale: metodologie e tecniche, III. Le tecniche qualitative*. Bologna: il Mulino; 2003.
12. Bichi R. *La conduzione delle interviste nella ricerca sociale*, Roma: Carocci; 2007.
13. Darley JM, Glucksberg S, Kinchla RA & Anolli L, *Fondamenti di psicologia*, Bologna: il Mulino; 1998.
14. Langellier KM & Hall DL *Interviewing women: A phenomenological approach to feminist communication research*, in Carter K. & Spitzack C., *Doing research on women's communication: Perspectives on theory and method*. Norwood: Ablex Publishing Corporation; 1989.
15. Romanoff BD, *Reclaiming Voice: Ethnographic Inquiry and Qualitative Research in a Postmodern Age*, in *Meaning Reconstruction and the Experience of Loss*, a cura di Neimeyer RA, Washington: American Psychological Association; 2001.
16. Josselson R. *Ethics and process in the narrative study of lives*, Thousand Oaks: SAGE Publications; 1996.
17. Bourdieu P. *Méditations Pascaliennes*. Paris: Seuil; 1997; it. tran. *Meditazioni Pascaliane*. Milano: Feltrinelli; 1998.
18. Remaury B. *Le beau sexe faible: les images du corps féminin entre cosmétique et santé*. Paris: Grasset & Fasquelle; 2000; it tran. *Il gentil sesso debole. Le immagini del corpo femminile tra bellezza e salute*. Roma: Maltemi; 2006.
19. Giddens A. *Modernity and Self Identity. Self and society in the Late Modern Age*. Cambridge: Polity Press; 1991.
20. Bauman Z. *In search of politics*. Cambridge: Polity Press; 1999; it. tran. *La società dell'incertezza*. Bologna: Il Mulino; 1999.
21. Turner BS., *Regulation bodies. Essays in Medical Sociology*. London/ New York: Routledge; 1992.
22. Juvini E. *Il trionfo del corpo*. Milano: Egea; 2005.

---

## Courses and Congresses

### 2018

**22-24 February - Malaga (Spain)**

**33th National Congress SEME**

**Spanish Society of Aesthetic Medicine**

Palacio de Ferias y Congresos

President: P. Vega

E-mail: [seme2018@pacifico-meetings.com](mailto:seme2018@pacifico-meetings.com)

Web: [www.seme2018.org](http://www.seme2018.org)

**2-3 March - Mexico City (Mexico)**

**15th Mexican Scientific Congress of**

**Aesthetic Medicine and Antiaging**

**15th Venezuelan Congress of Aesthetic Medicine**

Mexican Scientific Society of Aesthetic Medicine

Aesthetic Medicine Society of Venezuela

Presidents: J-B. Miller Kobisher and V. García Guevara

Venue: Pepsi Center - World Trade Center, Mexico City

E-mail: [congresoacademico@ippc.mx](mailto:congresoacademico@ippc.mx)

**4-6 April - Buenos Aires (Argentina)**

**12th Pan-American Congress of Aesthetic Medicine**

**28th Argentinian Congress of Aesthetic Medicine**

Argentinian Society of Aesthetic Medicine - SOARME

President: R. Pinto

Venue: Auditorio de la Universidad Católica Argentina

Av. Alicia Moreau de Justo 1680

Puerto Madero - Buenos Aires

Web: [www.soarme.com](http://www.soarme.com)

**19-21 April - Brussels (Belgium)**

**12th European congress UIME**

**National congress SBME-BVEG**

**Belgian Society of Aesthetic Medicine and Lasers**

Radisson Blu Royal Hotel

President: J. Hebrant, H. Cartier

E-mail: [info@aesthetic-medicine.be](mailto:info@aesthetic-medicine.be)

Web: [sbmebveg.be](http://sbmebveg.be)

**10-12 May - Pretoria (South Africa)**

**12th Aesthetic Medicine Congress South Africa**

**AMCSA 2018**

**Aesthetic and Anti-Aging Medicine Society of South Africa**

CSIR Convention Centre, Pretoria

President: J. Van Niekerk

E-mail: [info@aesthmed.co.za](mailto:info@aesthmed.co.za)

Web: [www.aesthmed.co.za](http://www.aesthmed.co.za)

**18-20 May - Rome (Italy)**

**39th National Congress of the Italian Society of Aesthetic Medicine**

**13th National Congress of the Italian Academy of Aesthetic Medicine**

Venue: Congress Centre Rome Cavalieri

President: E. Bartoletti

E-mail: [sime@lamedicinaestetica.it](mailto:sime@lamedicinaestetica.it) - [congresso@lamedicinaestetica.it](mailto:congresso@lamedicinaestetica.it)

Web: [www.lamedicinaestetica.it](http://www.lamedicinaestetica.it)



aesthetic medicine