

INNOVATIVE APPLICATIONS OF PREHEATED CARBOXYTHERAPY FOR HAIR LOSS TREATMENT

Dott.ssa Alessandra Scilletta

AUTHORS

Alessandra Scilletta , MD, Plastic Surgeon

M.D. Scilletta Alessandra has a degree in medicine and surgery at the University of Catania and a postgraduate diploma in plastic and reconstructive surgery at the University of Catania.

M.D. Scilletta is the author of various scientific publications and held various formative courses about Carboxytherapy abroad.

She worked in Spain for 13 months by the Plastic Surgery dept. of the Reina Sofia Hospital in Cordoba.

Currently, M.D. Scilletta is the medical director of a surgical private practice.

INTRODUCTION

Hair is made up of protein called keratin. An average adult head has about 100.000 to 150.000 hair. We lose 100 hair a day. As follicles produce new hair cells, old hair cells are forced out through the skin. Each follicle has its own life cycle, which can be influenced by age, diseases and other factors, and is divided in three phases:

Anagen (or hair growth phase),

Catagen (or cessation phase),

Telogen (or resting phase).

As people age, their rate of hair growth slows down.

DISCUSSION

Hair loss and thinning hair are caused by a combination of factors, including genetics and poor circulation.

It may occur as a natural part of aging, due to diseases, medications, poor diet, heredity, male pattern baldness or hormonal changes associated with pregnancy, menopausal changes, emotional stress, illness or injury.

There are varying types of hair loss such as:

- **Androgenic Alopecia/male pattern baldness:** this is the most common type of hair loss and it is usually seen in men. Female hair loss is also common and affects about 30% of the female population. Androgenetic alopecia is genetically predisposed hair loss. The follicle begins to produce hair with a shorter growth cycle and continues growing weaker and thinner hair during each succeeding cycle. This usually affects the top and crown.

- **Telogen effluvium:** it is most commonly seen in women. The hair

loss is distributed across the scalp. It can occur at any age; its onset can be quite sudden and it is often noticed by an increase of shedding hairs during washing or grooming. It usually appears as a decrease in hair density, instead of a bald patch.

- **Alopecia areata:** approximately 2% of the population develops this condition. There are one or more patches of reversible baldness.

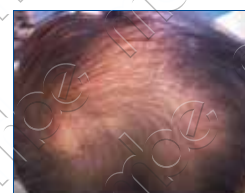
- **Traumatic alopecia**

- **Traction alopecia**

- **Cicatricial alopecia.**



Before



After

There are different options of treatment, as laser light therapy, hair transplant surgery, mesotherapy, drugs, platelet-rich plasma, carboxytherapy and Oxygen Infusion.

Carboxytherapy was born in France more than 80 years ago.

Its beneficial effects were initially observed in the Royat spa, when it was found out that patients bathing in the thermal waters rich in carbon dioxide showed quicker wound healing.

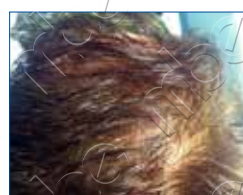
Since then, it has been proven that carboxytherapy can improve blood circulation, enhance skin's elasticity, etc.

As a result, this treatment method is gaining ground constantly in the field of dermatology, since the range of applications covers both medical and cosmetic needs of skin and hair.

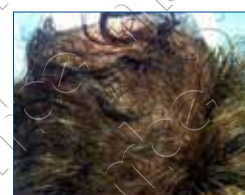
This therapy acts directly in the bulb, which constitutes the vital part of hair and whose alterations are a major cause of hair thinning and hair loss.

During the treatment, CO2 injections are performed in those areas of the scalp where hair thinning is observed. The aim is to enhance oxygenation and therefore nutrition of the weak hair follicles.

This treatment takes advantage of a completely natural process of our organism.



Before



After

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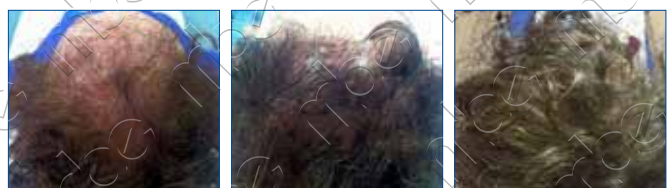
At the areas of injection, microcirculation is significantly improved, as the red blood cells are forced to release oxygen (Bohr Effect). This enhanced blood flow and tissue oxygenation allows skin regeneration and strengthening of hair follicle.

Carboxytherapy, also combined with Oxygen Infusion and PRP, has proven to be effective in helping reverse the trends of hair thinning and hair loss, by stimulating hair growth factors and blood circulation.

It improves circulation at the injection site by forcing red blood cells to release oxygen and to pick up CO₂ to eliminate it from the body. This oxygenating process causes angiogenesis of blood vessels in the area, thus nourishing the hair follicles.

In carboxytherapy hair rejuvenation, the injection of CO₂ has a vasodilatation effect (opening up of tiny blood vessels) which allows increasing nourishment of growth factors and nutrients to the scalp, thus increasing the hair growth and stabilizing the hair loss.

Carboxytherapy also has a beneficial effect in fighting scalp fibrosis. It is a great natural hair loss treatment and works wonder in combination with Oxygen Infusion and PRP.



Before During (at 3 months) After (at 1 year)

Oxygen Infusion has a natural anti-inflammatory effect.

It promotes oxygenation of the sheath of the hair bulb and reinforces the cell membrane. Moreover, oxygen regulates the synthesis of prostaglandins D₂, which are responsible of 90% of baldness.

The growth factors contained in the platelets are able to stimulate various cellular mechanisms, including proliferation and migration of fibroblasts and collagen synthesis, recalling or reactivating the stem cells present in the area that we are dealing with, and improving the skin conditions and skin annexes such as hair.

Patients usually notice a stabilization of the hair loss after 3 months and an increase in growth of vellus hair and thinning hair after 6 month. Most patients notice also a decrease in shedding in the first 3 to 6 months.

Carboxytherapy is usually very effective in the treatment of hair loss; however, in difficult cases – i.e. patients with not ideally compensated thyroid gland diseases, autoimmune disorders or psychic problems – the therapy is likely to be much less successful. In the best case, it will give just temporary effects.

It is therefore important to explain to the patients, which might be the realist expectations and, if necessary, integrate with other therapeutic possibilities.

During the gas administration, the vector of the injection should lead to the center of the capillitium area.

However, despite the best care and skills of the operator, the gas often tends to get to the forehead, around the eye or ear, or to the back of the neck.

This can be quite a strange feeling for the patient. It anyway normalizes in a few minutes, so it is always good to wait a little bit between each injection, with the aim to avoid the patient any unpleasant feeling.



Before During (at 3 months) During (at 6 months)

BIBLIOGRAPHY

Carboxytherapy in the Treatment of Hair Loss; Nina Koutna Surgery Curr Res 2012, 2:5

BioMed Research International Volume 2014 (2014), Clinical Study The Effect of Autologous Activated Platelet Rich Plasma (AA-PRP) Injection on Pattern Hair Loss: Clinical and Histomorphometric Evaluation V. Cervelli, 1 S. Garcovich, 2 A. Bielli, 3 G. Cervelli, 4 B. C. Curcio, 1 M. G. Scioli, 3 A. Orlandi, 3 and P. Gentile

Z. J. Li, H.-I. Choi, D.-K. Choi, et al., "Autologous platelet-rich plasma: a potential therapeutic tool for promoting hair growth," *Dermatologic Surgery*, vol. 38, no. 7, part 11, pp. 1040–1046, 2012.

.Uebel, J. B. da Silva, D. Cantarelli, and P. Martins, "The role of platelet plasma growth factors in male pattern baldness surgery," *Plastic and Reconstructive Surgery*, vol. 118, no. 6, pp. 1458–1466, 2006.

Trink, E. Sorbellini, P. Bezzola et al., "A randomized, double-blind, placebo- and active-controlled, half-head study to evaluate the effects of platelet-rich plasma on alopecia areata," *British Journal of Dermatology*, vol. 169, no. 3, pp. 690–694, 2013.

Mecklenburg, D. J. Tobin, S. Müller-Röver, et al., "Active hair growth (anagen) is associated with angiogenesis," *Journal of Investigative Dermatology*, vol. 114, no. 5, pp. 909–916, 2000.

Lachgar, H. Moukadiri, F. Jonca, et al., "Vascular endothelial growth factor is an autocrine growth factor for hair dermal papilla cells," *Journal of Investigative Dermatology*, vol. 106, no. 1, pp. 17–23, 1996.

Increase in collagen turnover induced by intradermal injection of Carbon-Dioxide in rats.

Julio Cesar Tavares Ferreira MD, a Alessandra Haddad MD PhD, b Simone Arruda Navarro Tavares - 2008 JOURNAL OF DRUGS IN DERMATOLOGY, pagg. 201 – 208.