



Aesthetic and multiple whole-body cryotherapy exposures.

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Introduction

Whole-body cryotherapy is growing increasingly popular due to many purported benefits, especially those pertaining to skin health. The marketing of these claims combined with the advent of readily accessible cryotherapy facilities and medical spas should caution dermatologists to be aware of the trend and also the data behind it. Despite being advertised as treatments for anti-aging, skin rejuvenation, and wrinkle reduction, there is at the present time only few evidences to support these claims. Although there may be some support for their role in decreasing oxidative stress and improving sleep and mental health, this is limited and only peripherally related at best to aesthetics. However, many publications could be easily linked to beneficials effects in the beauty area. In this context, find below some scientific elements to facilitate the understanding to aesthetic approach.

Key point 1: Low temp influence on different parts on the body

After whole-body cryotherapy treatments, where the skin is subjected to temperatures below -100°C , the reaction of the organism to the cold in the thermoregulation range is carried out in two stages, with the phase of ischemia and reperfusion. In the first phase, it comes to the narrowing of the blood vessels; the blood supply to the skin decreases, which leads to the skin whitening in the place of the stimulus. Coldstimulated, thermo-receptors in the skin stimulate the nervous system to trigger the body's response to reduce the chilling of the body. The limitation of heat loss is inhibited by vasoconstriction, thus leading to the reduction of blood flow through the skin. Moreover, The results of our own research have shown that the upper limbs and lower limbs respond more significantly to the cold because the greatest differences between the initial temperature and the temperature after the cryotherapy treatments were noted in these areas.

[Associated reference: Costello JT, Culligan K, Selfe J, Donnelly AE (2012) Muscle, Skin and Core Temperature after 2110°C Cold Air and 8°C Water Treatment. PLoS ONE 7(11): e48190. doi:10.1371/journal.pone.0048190].

Key point 2: Low temp on skin properties

Cryotherapy due to its non-invasive nature is increasingly used in aesthetic medicine in order to care for the body and the appearance of the skin. The effects that appear after the application of low temperature on the human skin are: improvement of skin tone, slowing down of the ageing process, the overall effect of loosening of the body, relaxation. Low temperatures are also used to improve the

firmness and hydration of the skin, reduce pain perception during other treatments, eliminate skin changes, and reduce excessive fat tissue

[Associated reference: I. Wiśniewska, K. Kuskowska, B. Łukasiewicz Contemporary Cosmetology - Modern Devices, 1 ed., Atena publishing house, Warsaw, 2012].

Key point 3: WBC and dermatology

Literature review reveals newer possibilities of using low temperatures in cosmetology and dermatology. There are objective and subjective reports occurring about the positive impact of this factor. Thanks to the easy methodology of conducting the procedure and its safe nature, it is possible to use cryotherapy in order to alleviate shallowly positioned vascular changes and fight cellulite.

[Associated reference: B. Englisz, A. Stanek, K. Sieroń-Stożny, A. Cholewka, Contemporary cryotherapy in aesthetic medicine and bioregeneration, Aesthetica 20 (2017) 66–70].

[Associated reference: M. Rogóż, A. Pulik, A. Stasińko-Tłuczek, Characteristic and reduction of vascular changes occurring in the facial area. Part II Minimally invasive procedures, Aesth. Cosmetol. 6 (2017) 399–404].

Key point 4: WBC and skin hydration

It has been proven that cryotherapy influences the increase of skin hydration level and is a well tolerated treatment for patients. A study analysed the effect of the treatment with the application of low temperature on the skin and was compared with the treatment using radio waves, increasing the skin temperature. The tests were conducted on 21 women aged 30–40. The result of the measurement of the hydration level after a series of treatments in the control group was 53%, in the group in which radio waves were used: 57%, and in the group where cryotherapy was used: 58%. The skin sebum measurement in the control group was 27%, in the group with radio waves 35% and in the group after cryotherapy 34%. Analysing the results of each group, it can be stated that the higher the lubrication of the skin, the higher the level of hydration. It was shown that both treatments with radio waves and the cryotherapy treatment had a positive effect on the tested skin parameters.

[Associated reference: J.-H. Kang, The comparison of the effect of thermotherapy and cryotherapy on the skin, Asian J. Beauty Cosmetol. 11 (2013) 281–288].

Key point 5 : WBC and skin lubrication

After a series of ten treatment sessions, the greatest decrease was observed in skin hydration and skin temperature. No significant differences were noted for lubrication and skin pH. The analysis showed statistically significant differences in skin parameters between all measurement locations; the upper and lower limbs responded more significantly to cold than other parts of the body. It was also found that the facial skin was more lubricated and hydrated compared to other measuring locations. We conclude that varies skin parts respond differently to low temperature.

[Associated reference: Anna Skrzek , Agnieszka Ciszek , Danuta Nowicka , Agnieszka Dębiec-Bąk Evaluation of changes in selected skin parameters under the influence of extremely low temperature. 2019 Feb;86:19-24].

Key point 6: WBC reduces oxidative stress and improves lipid profile.

The effect of ten WBC procedures lasting 3 minutes a day followed by a 60-minute session kinesiotherapy on oxidative stress and lipid profile in healthy subjects was investigated. After treatment, in the WBC group, a significant decrease of oxidative stress markers and a significant increase of total antioxidant capacity were observed. The levels of Total Cholesterol and LDL-Cholesterol (the « bad one ») decreased significantly after treatment in the WBC group. The level of Triglycerides (i.e. circulating fat stores) decreased significantly after treatment in the WBC group only. Then, WBC performed in a closed cryochamber followed by kinesiotherapy improves lipid profile and decreases oxidative stress in healthy subjects.

[Associated reference: Agata Stanek, Ewa Romuk, Tomasz Wielkoszyński, Stanisław Bartuś, Grzegorz Cieślar, and Armand Cholewka. Decreased Lipid Profile and Oxidative Stress in Healthy Subjects Who Underwent Whole-Body Cryotherapy in Closed Cryochamber with Subsequent Kinesiotherapy Volume 2019 |Article ID 7524878 | <https://doi.org/10.1155/2019/7524878>].

Key point 7: WBC and overweight people : a new target for body fat management ?

Irisin is considered to be beneficial in the treatment of obesity, diabetes, and a wide range of pathological conditions characterized by an imbalance between energy demand and expenditure. Hence, irisin seems to be an important link between cold exposure treatment and overweight people. The study demonstrates that 10 sessions of the whole body cryostimulation caused the rise of irisin concentration in overweight men. The obtained data confirm our initial hypothesis that exposure to extremely cold environment might induce muscle shivering and consequently irisin release from the muscle. Still, diverse tendency in irisin concentration among physically active and nonactive subjects following 10 sessions, might suggest that fat tissue has also contributed to the irisin secretion. It's a way to approach in a next future the cold therapy in association to fat burning.

[Associated reference : Katarzyna Dulian, Radosław Laskowski, Tomasz Grzywacz, Sylwester Kujach, Damian J Flis, Mirosław Smaruj, Ewa Ziemann. The whole body cryostimulation modifies irisin concentration and reduces inflammation in middle aged, obese men. Cryobiology 2015 Dec;71(3):398-404. doi: 10.1016/j.cryobiol.2015.10.143. Epub 2015 Oct 22]