



Whole- and partial-body cryotherapy in aesthetic dermatology: Evaluating a trendy treatment

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Abstract

This manuscript addresses the use of whole- and partial-body cryotherapy in aesthetic dermatology. Over the past several years, these have become trendy treatments that have been marketed for many purported benefits in overall skin appearance and skin health. With increased access through cryotherapy facilities and medical spas, whole- and partial-body cryotherapy have grown in popularity. Unfortunately, many of the advertised claims have little, if any, scientific evidence behind them. Here, we summarize the data available in the literature. As trends evolve, clinicians should continue to be knowledgeable about them and their evidence in order to properly counsel patients appropriately.

KEYWORDS

aesthetics, aging, cryotherapy, dermatology, whole-body cryotherapy

1 | INTRODUCTION

Whole- and partial-body cryotherapy are extreme cooling techniques that have become trendy in the world of health, wellness, and sports. They were originally utilized by patients with multiple sclerosis and rheumatoid arthritis for purposes of analgesia and decreased inflammation. However, whole- and partial-body cryotherapy have now grown more accessible and are offered through various medical spas, wellness centers, and cryotherapy facilities throughout the country.

During whole-body cryotherapy sessions, individuals enter into a chamber that is cooled to -100 to -140 degrees Celsius for about 2-5 minutes, which can be completed regularly for therapeutic benefit.¹ Methods for delivering the cooling can be adjusted for partial-body cryotherapy, in which treatment is limited to certain body sites. The face has become a frequently targeted area for aesthetic treatments, which have been referred to as “cryo-facials.”

Whole-body cryotherapy has become increasingly popular for elite athletes following rigorous exercise in an attempt to decrease muscle recovery time.¹ However, a 2015 Cochrane Review reported that there was insufficient evidence to determine whether it improved muscle recovery in active young male adults, and also indicated that there were no data for either females or elite athletes.²

Both whole- and partial-body cryotherapy have been marketed to improve physiologic and psychologic conditions. They have been promoted to help those suffering from inflammatory diseases, such as ankylosing spondylitis, fibromyalgia, and chronic low back pain, as well as psychiatric conditions, including depression and anxiety.³ Other endorsed benefits include fatigue resistance, weight loss, and pain relief. Specific to dermatology, these treatments have been advertised to purportedly help with wrinkle reduction, reversal of skin aging, increasing the “glow” of the skin, and improvements in overall skin appearance and skin health.

Despite these alleged benefits, the FDA has yet to approve any whole-body cryotherapy chambers or devices and also warns patients about potential harmful effects, which can include asphyxiation, burns, frostbite, and eye injury. There is an additional gross lack of evidence regarding the safety of treatments and procedure protocols.^{2,3}

Due to the trendy nature of whole- and partial-body cryotherapy in dermatology, we sought to review the literature for evidence of the many marketed benefits to the skin. However, no extensive data were found. Instead, we were only able to glean limited data on the effects of these treatments, which may, at best, be only peripherally related to facial appearance. Here, we summarize these data and discuss the impact of our findings.

2 | OXIDATIVE STRESS

Over the years, studies have assessed the role of oxidative stress and its effects in several inflammatory conditions as well as aging processes of the skin. Reactive oxygen species (ROS) producing enzymes in skin cells, such as NADPH oxidases, xanthine oxidoreductase, peroxisomal oxidases, cyclooxygenases, and various enzymes of the cytochrome P450 system, have been implicated in photoaging.⁴ Ultraviolet A (UVA) irradiation also leads to the generation of ROS, such as superoxide, hydroxyl radical, and hydrogen peroxide, in both the dermis and epidermis, which subsequently causes cellular damage. These ROS are associated with damage to nuclear and mitochondrial DNA. In turn, this increases the production of additional intracellular ROS, which further propagates the cycle of cellular damage.⁴ Studies have suggested that whole-body cryotherapy decreases the generation of ROS. Miller et al⁵ reported that hypothermia can inhibit ROS development and may additionally stimulate the production of beneficial antioxidants as a defense mechanism for extreme cold temperatures, which he studied in patients with multiple sclerosis undergoing whole-body cryotherapy. However, there are not enough data to support the use of this treatment modality as an effective therapeutic tool to decrease oxidative damage in the skin.

3 | QUALITY OF SLEEP

Various studies have suggested that whole- and partial-body cryotherapy have been associated with the perception of improved quality of sleep in athletes.³ Schaal et al⁶ reported that daily whole-body cryotherapy sessions resulted in decreased fatigue and improved exercise capacity in addition to enhanced quality of sleep in elite synchronized swimmers. The association between sleep quality and facial appearance is well-understood. In general, the faces of sleep-deprived individuals are perceived to be paler with more wrinkles and fine lines, and also with more swollen, redder eyes with darker circles underneath.⁷ However, the direct link between sleep enhancement from whole-body cryotherapy and improvements in facial appearance was not examined in any previous studies.

4 | MENTAL HEALTH

Studies have examined the relationship of cryotherapy treatment sessions to mental health and quality of life. Rymaszewska et al⁸ reported that symptoms of depression and anxiety were improved after several sessions of whole-body cryotherapy. They postulated that this may be due to its effects on the HPA axis and activation of the endogenous opioid system. Other studies have demonstrated improvements in mood, general well-being, and quality of life in patients being treated for joint disease and chronic pain

syndromes.³ It is generally believed that improvements in mood can affect the facial appearance of patients and vice versa. Although the relationship between facial appearance and depression has been understood, there is no direct evidence to suggest that the use of whole- or partial-body cryotherapy as a functional therapeutic option for depression would have a significant impact on facial presentation.

5 | CONCLUSION

Whole- and partial-body cryotherapy are 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.

There is currently a gross lack of data in the literature, and more research is needed in order to fully understand the risks and benefits. Despite being advertised as treatments for anti-aging, skin rejuvenation, and wrinkle reduction, there is no evidence 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. These findings should not justify treatments. Practitioners should be cautious when discussing whole- and partial-body cryotherapy with patients and should advise them appropriately.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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