

Topical Treatment Of Acne Vulgaris With Plaque Cryolipolysis Associated With Microcurrents

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Abstract:

A Acne is one of the most common chronic inflammatory skin conditions. It can be chronically inflammatory, affecting the polysebaceous follicle, and is of genetic, hormonal and/or multifactorial origin.

This study evaluated the effectiveness of a new procedure using the mobile handle technique plus microcurrents. Eighteen patients with moderate to severe acne vulgaris of both sexes were treated, ranging in age from 18 to 35 years; 60% had moderate to severe acne, and 40% had moderate acne. Three mobile handle sessions were performed, one per week. Two patients reported acne breakouts between 7 and 10 days after treatment, which resolved within a few days; 75% of patients reported improvements after 3 to 4 weeks, and over time they improved; the number of acnes was significantly reduced. 30% of patients reported improvements after 45 days. For 35% of patients, one session was sufficient, with recommended measures to keep acne under control; Patients reported a reduction in skin pores and an improvement in skin quality. There was no downtime or side effects. In this study, patients with moderate to severe acne underwent 3 treatments and reported a reduction in acne and skin inflammation.

Objective: The present study was conducted to determine the feasibility of treating acne vulgaris by dermal cooling, mainly emphasizing the use of plate cryolipolysis associated with the use of microcurrents, demonstrating the efficacy of this technique in patients with a high degree of acne.

Materials and Methods: This study included 18 patients of both sexes between 18 and 35 years of age affected by moderate to severe acne vulgaris (inflammatory). Participants underwent 3 treatment sessions with Criotonus®, a mobile cryolipolysis technique in the form of plates associated with microcurrents. During each visit, the researcher performed an assessment of the facial skin of all participants, classifying them according to the index: Investigator Global Assessment (IGA). Facial acne was evaluated by the authors using a scale with a total of 6 global assessment points. In addition, participants evaluated their progress at each visit, using a classification system that issued grades according to the degree of satisfaction, allowing the subjects to evaluate their satisfaction on a total of 7 levels.

Conclusion: Cryotherapy combined with microcurrent effectively improved acne lesions, which was safe and satisfactory for participants. These findings suggest its potential as an alternative therapeutic modality, especially for populations with limited treatment options. Consequently, we suggest that this treatment should be considered a first-line option, especially in cases where systemic treatments are not indicated. Patient compliance was extremely high.

Keywords: Dermatological treatments, cryolipolise, microcurrents, acne vulgaris, dermatology

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I. Introduction

Acne is one of the chronic inflammatory conditions/diseases that most affects the skin (CORREA; SILVA; OLIVEIRA 2010; DEUSCHLE et al., 2015). It can be chronically inflammatory, affecting the polysebaceous follicle, and is of genetic, hormonal and/or multifactorial origin. Taking medications, factors such as stress and an inappropriate diet can aggravate the condition (DEUSCHLE et al., 2015). The signs commonly begin to appear in adolescence; it is believed to have an incidence of 85% among young people aged 12 to 24 (RODRIGUES NETO et al., 2015). It affects both sexes, being normally more severe in men during adolescence

(UDA; WANCZINSKI, 2008) but more persistent in women (FIGUEIREDO et al., 2011; RUIZ-SILVA, 2024). Acne is the most common disease that affects the sebaceous follicle among others that attack human skin (BACCOLI et al., 2015). Because it is often genetic-hormonal, it is common in adolescents (MACHADO et al., 2012). It affects 80% of the population between 11 and 30 years of age (MONTENEGRO; COSTA; BRANCO, 2013). In acne vulgaris, there is an increase in the spread of bacteria and local inflammation of the dermis (MATSUCHITA; MATSUCHITA, 2014; RODRIGUES NETO et al., 2015; ALONSO; FERNANDEZ, 2011). The primary cause of the pathology is the occlusion of the pilosebaceous arrangement (COSTA; ALCHORNE; GOLDSCHMIDT, 2008) that gives rise to the microKeratin (skin debris) (Comedones). When it increases in size, the follicular duct dilates, resulting in the appearance of an open Keratin (skin debris) also called a blackhead, which is generally not inflamed. When the orifice does not expand, the closed Keratin (skin debris), also called a whitehead, which is generally inflamed, appears. The inflammation and distension of the follicle walls, known as a papule, can rupture, releasing the contents into the dermis, initiating an inflammatory reaction of unknown body classified as pustules and nodules (UDA; WANCZINSKI, 2008; MAIER; RENE; LUBI 2013; DEUSCHLE et al., 2015).

Acne vulgaris is a common disease in approximately 80% of young adults and adolescents. Acne can affect both sexes, even before puberty. This skin disorder is a complex chronic inflammatory disease of the skin, characterized by open and closed Keratin (skin debris). (not always visible) and lesions with inflammatory nodules, pustules and papules, which usually affect the face, back and chest (GOLD, 2028; STRAUSS, 2007).

Acne vulgaris is a chronic disease that usually requires prolonged therapy for a satisfactory result (RUIZ-SILVA, 2024).

Adherence to treatment in patients is a major problem, both for systemic and topical treatments, due to side effects and prolonged treatment time. Insufficient adherence is very common and leads to acne recurrence, patient dissatisfaction and increased medical costs. Numerous studies have reported low adherence rates for general local acne treatments, with the United States having the lowest rate of 11.74% (TAN, 2013).

Traditionally, therapeutic modalities for acne range from topical agents to systemic medications, each with its own set of limitations and potential side effects (GOLD, 2028). Oral isotretinoin is currently the most effective option; however, it is shrouded in controversy related to its teratogenicity, suicide, and risks of inflammatory bowel disease (STRAUSS, 2007). Prolonged use of oral antibiotics is also problematic because it increases the risk of acquiring resistant bacterial strains (TAN, 2013).

Cryotherapy has a long history in the field of dermatology, widely used for the destruction of epidermal lesions such as actinic keratosis or warts vulgaris (RAY, 2015).

Before the advent of effective medications, cryotherapy was in vogue in the treatment of patients with acne; however, this approach seems to be considered obsolete today, as mentioned by Plewig and Kligman (PLEWIG, 2000).

However, traditional and conventional methods with liquid nitrogen spray have been limited for acne due to several disadvantages, including frostbite and hypopigmentation (RHO, 2022).

The advancement of plate cryolipolysis and current studies that associate it with microcurrents make it possible to use it for acne treatments while avoiding possible lesions (RUIZ-SILVA, 2024; 2025)

II. Material And Methods

This study included 18 patients of both sexes between 18 and 35 years old affected by acne vulgaris. (inflammatory) Of these patients, 60% had moderate to severe acne, while 40% had moderate to severe acne.

The main exclusion criteria are: (i) history of treatment with oral retinoid or chemical peel during the previous 6 months; (ii) history of treatment with antiandrogenic contraceptives during the previous 3 months; (iii) history of treatment with oral or topical antibiotics, topical retinoids or systemic steroids during or more previously; (iv) individuals with a history of keloids or hypertrophic scars; (v) individuals with a history of cold urticaria, cold paroxysmal hemoglobinuria, and evidence of connective tissue and cold; and (vi) pregnant or lactating women.

The participants will undergo 3 treatment sessions with Criotonus®, a mobile mitt technique with plate cryolipolise associated with microcurrents with a frequency of 0.5 Hz and an intensity of 150 uA.

Were performed 4 series of moving mitt for 5 minutes each, The cold process reported here guarantees high reproducibility to professionals, being replicable.

During each visit, the researcher conducted a facial skin assessment of all participants. Digital photographs of the face are taken before treatment and at each visit.

The global severity of all acne lesions was analyzed based on the photographs by the authors that we used the Investigator Global Assessment (IGA) (grade 0 = seven lesions; grade 1 = peel almost clear; 2 = mild acne; 3 = moderate acne; 4 = severe acne).

The best general facial acne was validated by the authors using a total of 6 levels from the global assessment point.

grade 0 = 100% improved;
1 = 75%–100% better;
2 = 50%–75% better;
3 = < 50% better;
4 = never move;
5 = worsened).

Additionally, participants are directly assessed how satisfied they are with the treatment of acne lesions at each visit using notes that vary from grade 1 (very dissatisfied) to grade 7 (very satisfied), allowing subjects to evaluate their satisfaction in a single visit. total of 7 levels

III. Result

Of the 18 patients included in this study, none dropped out, with 3 reporting that between 7 and 10 days after treatment, there were few acne breakouts that resolved within a few days. Seventy-five percent of patients reported improvement after 3 to 4 weeks, and this has improved over time. The number of acne lesions was significantly reduced, and inflammation was always superficial. In addition, 30% of patients reported impressive improvements after 45 days.

In the evaluation using the IGA scoring criteria, which indicated moderate to severe acne, after Criotonus decreased significantly throughout the treatment, reaching low scores and some to zero, demonstrating the effectiveness in obtaining lesion-free results.

There was improvement in acne erythema, in the clinical evaluation of the lesion there was a notable improvement of around 75%, and the satisfaction score indicated a high level of satisfaction. There were no side effects



Figure 1: Female Patient MEL, 18 Years Old



Figure 2: Female Patient, BA 28 Years Old



Figure 3: Female Patient, MB 22 Years Old



Figure 4: Female Patient, JC 32 Years Old

IV. Discussion

Cryolipolysis associated with microcurrents has been attracting the attention of aesthetic, dermatology and health professionals due to its ability to treat various dysfunctions and its popularization by scientific publications (RUIZ-SILVA, 2024; 2025), in addition to cryotherapy, which has already been used to treat acne in previous studies, reporting a reduction in oxidative stress and an anti-inflammatory effect (KAMINSKY, 2003).

In this study, Criotonus (plate cryolipolysis associated with microcurrents) was applied to acne lesions and showed a rapid therapeutic effect after a single treatment, leading to a 50% improvement in the lesions.

We used the technique based on previous findings, which demonstrate that cold therapy restores the microflora and normalizes excessive keratinization of hair follicles, which is what will reasonably infer its applicability to acne (DZUBOW, 1985; KNAGGS, 1994).

Cryolipolysis for acne includes a mechanism of increased dermal microcirculation, improved sebum evacuation and modulation of the immune response (RAY, 2015; KOTOVA, 2018; LEE, 2020). It also generates activation of crest formation in mitochondria (RUIZ-SILVA, 2024; 2024).

Considering the greater vulnerability of lipid-containing cells to cold injury (GAGEA, 1975), controlled local cooling of the skin may allow selective damage to the sebaceous glands.

In the study by Burge in 1990, he reported that mild freezing injury led to contraction and deterioration of the sebaceous glands after superficial cryotherapy (BURGE, 1990).

Cell infiltration and partial damage to sebaceous gland cells were observed (MA, 2021).

Ray found that cooling-induced damage reduced sebum production by 20% over 2 weeks (RAY, 2015).

There was a decrease in the inflammatory process, enhanced by microcurrents (RUIZ-SILVA, 2024; 2025)

V. Conclusion

Cryotherapy combined with microcurrent effectively improved acne lesions, which was safe and satisfactory for participants. These findings suggest its potential as an alternative therapeutic modality, especially for populations with limited treatment options.

Consequently, we suggest that this treatment should be considered a first-line option, especially in cases where systemic treatments are not indicated. Patient compliance was extremely high.

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